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## **REVISITING THE RETAIL CHANGE THEORIES: A QUEST FOR CONTEMPORARY MODEL OF RETAIL CHANGE (CMRC) IN BANGLADESH**

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### **ABSTRACT**

*Changes in retailing over the world has been subject to study for long period of time. Researchers proposes several theories of retail changes, most of which are applicable in the developed country perspective, aged and did not consider the contemporary issues like deployment of technologies and sustainability in retail business. Present study aims to review the existing theories of retail changes to propose a new retail change model for Bangladesh. For this purpose, this study rigorously reviewed the relevant articles, journals and other secondary materials. Considering the relative offerings of the retailers and the impact of environment on the retail business, the Contemporary Model of Retail Change (CMRC) shows that the retail industry of Bangladesh is changing towards the supermarket and e-tailing to multi-channel retailing to smart retailing to the sustainable retailing. The poor access to internet to the people, low score to the sustainable business practices and environmental performances are the major obstacles to reach the model, thus the strategies like ensure the adoption of internet and formulating policies to ensure sustainable retailing may ensure the attainment of the model. Though the retail business is emerging towards the contemporary business models, huge number of population till do not have the internet access and the country is far away from the sustainable business attainment which are the main challenges of modern retail business in Bangladesh.*

**KEYWORDS:** Retailing, Change, Theory, Sustainability, Bangladesh.

## 1.INTRODUCTION

There have not any specific theories, approaches, processes and methods to describe the change (Young, 2004), it becomes ongoing system in the institutions and active driver in business life (Bhuiyan and Alam, 2014). The change process is not an easy task, it necessitates planning, motivation and professional execution (Kotter, 1996) and change in an organization take places over long time and it requires endurance, fit between synchronization and discordance as well as stages of enactment to attain the results (Bhuiyan and Alam, 2014). The economy, size and pattern of workforce, international trade, technological development and political environments have been considered as the drivers of changes (Ono and Wedemeyer, 1994; Kanter, 1985).

Since 1950, the retail industry was governed by the individual small retailer or grocer, the customers were generally known to the retailers but the retailing now a days are dominated by the supermarket and superstore, operated by some companies which occupies the major market shares as these supermarkets are introducing new shopping experiences for the customer, they are free to choice their own goods and eradicating the human interaction in checkout, purchases due to the deployment of technology like scanner, infrared devices etc. as well as the retail stores can generate the customer profile swiping the loyalty cards; resulting the decline of small retailers (Clough, R, 2002). However, the changes in retailing have been associated to the industrial revolution (Dawson and Kirby, 1980) and academic concern for the many decades. The researchers and scholars explain the numerous theories of the retail changes like the Wheel of Retailing (McNair, 1958), the Big Middle (Levy M. et al, 2005), the Retail Accordion theory (Hollander, 1966), *The Retail Life Cycle Theory* (Davidson, Bates and Bass, 1976), Dialectic theory (Gist, 1968), the Environmental Theory (Blizzard, 1976; Brown, 1987; Gist, 1968; Oren, 1989), the Combined Theory (Kim, 2006) etc. where they address the multiple nature of the retail changes.

The most of the renowned retail change models are explained on the developed country perspective, these theories did not explain the implication for the developing and least developed countries. Though some of the retail change theories explained the environmental cues as change agents, but the rapid rise and implications of the technology dramatically changes the retail scenario which goes beyond the imagination of those theories. Besides, though the present theory has a revolutionary importance in the field of retailing, they did not focus on the contemporary issues like sustainability which is immense concern for the present business world.

In the last 20 years, retail expansion has accelerated and included more and more countries in South America and East and Southeast Asia as well as a few countries in Africa. Lately, also South Asia and low-income countries in other world regions are experiencing the retail changes (Altenburg et al, 2016). In Bangladesh, the retailing is one of the oldest business form and in pace of changes in world retailing, the retailing industry of Bangladesh is also changing over the last decade (Shamser R, 2017; Ahmed S, M, S, 2017; Sarker and Ashrafi, 2018). Scholars and researchers explained changes of retailing industry in different scopes like the spatial changes (Hossain, 2014; Hossain, 2009), changes of retailing towards organized retailing (Shamser R, 2017; Ahmed S, M, S, 2017; Sarker and Ashrafi, 2018), the changes in consumer behavior (), changes towards e-commerce and e-tailing etc. (Islam and Eva, 2019; Karim and Qi, 2018; Sahel, Anwar and Nandi, 2018; Islam, 2018). Researchers (Farid et al, 2018), also explained the reasons of these changes including the direct and associated factors like are growth in GDP, FDI, education, dual income family etc. are responsible for the growth of supermarkets in Bangladesh. Most of these literatures focused on the diverse issues of retailing, none of these proposed retail



change models considering the established theories. So, it is the high time to initiate the appropriate retail change model for Bangladesh.

## 2. Objectives of the study

Present study aims to review the existing theories of retail change for proposing a new retail change model applicable in Bangladesh perspective. However the specific objectives of the study are to:

- critically analyze the existing retail change theories
- identify and explain the contemporary issues of retail practices and
- propose a retail change model for Bangladesh based on the flaws of existing theories and contemporary issues of retailing.

## 3. METHODOLOGY

This study is descriptive, theoretical and exploratory in nature. Numerous types of secondary data including research articles, journals, dissertations and reports etc. related to the retail change theories and contemporary issues of retailing has been rigorously reviewed. Moreover, the contents of different electronic sources like websites and other electronic sources are also analyzed. To portray the retail scenario of Bangladesh, the relevant research articles on retail industry of Bangladesh, publications of Bangladesh Bureau of Statistics (BBS), Bangladesh Brand Forum (BBF), Bangladesh Supermarkets Owners Association (BSOA), various web contents and blogs has been consulted and cited accordingly.

## 4. Revisiting the Retail Change Theories:

Retailing changes has been occurred for numerous reasons. For example, the economic factors like distribution cost, transaction cost and gross margin (Mallen 1973; Williamson 1975; Tucker 1978), number of intermediaries played role in the distribution channel (Hall and Knapp, 1959; Jeffery, 2011) etc. The active entrepreneurial role and franchise revolution (Aldrich and Zimmer, 1986; Anitsal and Anitsal, 2011; Dant, Grunhagen and Windsperger 2011; Dant and Grunhagen 2014) and the environmental influence on the retail business (Buckley 2011; Clarke, 2005) also causes the changes in retail institutions. However, the well-known Retail change theories are: Cyclical theory, Conflict theory, Environmental theory, Combined theory, etc. (Clough, 2002; Kim 2003). The propositions of these theories of retail changes are explained briefly in the following parts.

**4.1: Cyclical Theories:** The concept of cyclical theories denotes that retail institutions changes in a rhythmical or cyclical pattern by overcoming their earlier patterns. The cyclical theories include the Wheel of Retailing, the Retail Accordion, the Polarization Principle, the Multi-Polarization Model and the Retail Life Cycle. *Wheel of retailing theory* (McNair, 1958), states that the evolution process consists of three phases: entry phase-starts with the opening of innovative retail institutions, which initially offer limited products with low prices and minimum services, then shifts to the trade-up phase characterizing elaborate facilities, expected essential and exotic services, higher rent locations fashion orientations higher prices extended product offering and ends with vulnerable phase featuring higher levels of operational practices, operation costs increase, product prices rise, and profit margins tend to erode, lose market share and profitability and emergence of a new innovative retailer in the next cycle. *The retail Accordion Theory* (Hollander, 1966), demonstrate retail evolution as a cyclical trend starting with

broad assortment of merchandise, alternates with domination by specialized, narrow-line merchants and returns to the inventory profile of the old operation with a broad assortment of many lines of merchandise. The number of product lines and the depth of inventory inflates over time which Hollander analyzed in the general stores, drug stores, supermarkets, department stores, and discount stores in the United States. *The Polarization Principle* (Kirby, 1976a, 1976b) argued that the consumer prefer small stores conveniently located close to the residence and use these stores for augment shopping for emergencies or purchase of perishables and fresh food items instead of shopping from the larger, fewer, and less spatially concentrated supermarkets. *The Multi Polarization Principle* (Brown, 1987), argued that retailing evolves with three dimensions simultaneously including specialization, smaller outlets and a high level of service which are driven by inventory diversification instead of single polarization either low-margin/high-turnover outlets or high margin/low-turnover retailing. *The Retail Life Cycle Theory* (Davidson, Bates and Bass, 1976), explains the retail institutions goes natural evolutionary process like the products life cycle (Davidson, 1970; McCammon, 1975) and the stages of the life cycle are innovation, accelerated development, maturity and decline argues that adopting changes in these lifecycle stages is the way to maintain profit.

**4.2: Big Middle:** The Big Middle theory, the retail institutes evolves based on two strategic aspects: relative price and relative offerings which categorize the retailing into Innovative retailer who are quality and high offering conscious, Big Middle who offer innovative merchandise at reasonable prices, Low-price retailer who are price conscious and Trouble retailers are those who failed to deliver either high value or quality than their competitor (Levy M. et al 2005). The theory illustrates that retail institutions inclined to initiate as either innovative or low-price retailers, and the successful one transforms to the Big Middle and they compete in the long run as the largest number of potential customers belongs to them because of their value offering, excel at innovation and scale economies.

**4.3: The Conflict Theory:** Conflict theories, named as Dialectic retail evolution lights on the inter-institutional contention arising when a new retail institution appears and the theory was proposed by Gist (1968). In Dialectic theory, a current retail institution is confronted by its competitor because of competitive advantages and current retail institution imitates the features of competitor to elevate its existing characteristics results a new retail institution. Thus while two retail institutions are in conflict, a new retail institution is innovated with better features than the existing two retail institutions. When a new retail institution arrived, existing retailer resists but with the time passes, it started adopting the features of new one and differentiating it by forming a new retail institution (Brown, 1987; 1988).

**4.4: Environmental Theory:** The common concept among the Environmental theorists is that the retail environment is the main factor to retail changes, and to persist change and competition, retail institutions must evolve by adapting or adjusting to the environmental changes (Blizzard, 1976; Brown, 1987; Gist, 1968; Oren, 1989). The major environmental elements causing retail evolution are the demographic, social, economic, cultural, technological legal environment and competition (Gist, 1968; Brown, 1988; Oren, 1989). The concept suggests that the retail institution can only when it best adapts to environmental changes (Brown, 1987). This theory follows the Charles Darwin's theory on survival of the species and known as Darwinian Theory (Levy M. et al, 2005; Forester 1995).

**4.5: Combined Theory:** Combined theory attempts to combine two or more evolution theories to explain retail evolution. The combined theories includes the *Combination of Cyclical and*

*Environmental Theory, Combination of Cyclical and Conflict Theory, Combination of Environmental and Conflict theory, Combination of Environmental, Cyclical and Conflict Theory and Combined Retail Evolution Model. Combination of Cyclical and Environmental Theory* addressed that a retail institution's cyclical evolution followed simultaneously to environmental changes believing the Wheel of Retailing theory (i.e., Cyclical theory) and environmental changes (e.g., cultural, political, socio-economic, legislative, and business structure changes) are the main factors on cyclical evolution of a retail institution type (i.e., Environmental theory) (Brown, 1987). *Combination of Cyclical and Conflict Theory* proposed that a retail institution evolved cyclically, while conflicting with a new innovative retailer or other challengers (Dreesman, 1968; Bartels, 1981; Brown, 1988), institutional conflicts forced retail institutions' trade-up practices; therefore, retail institutions change or evolve to compete with their competitors. Similarly in the Three Wheels of Retailing theory (Izraeli, 1973) proposed the three wheels of retail changes are low-end innovation, high-end innovation, and high and low-end conventional retailers which evolves cyclically but in time of changes conflicts with high-end conventional retail institution types and high-end innovations of a retail institution type, and low-end conventional retail institution types conflict with low-end innovations. As a result, two new high-end and low-end innovators in retail institution types occurred. *Combination of Environmental and Conflict theory* noted that environments were evolving with changes in the economy, technology, society, consumer demographics, marketing, and managerial methods and a new retail institution type is evolving under the environmental developments, additional retailers start competing with this retail institution type. As a result of the conflict, another new retail innovation is created (Guiltinan, 1974; Alderson, 1957; Brown, 1988). Studies (Jeffreys, 1954; Regan, 1964) also explained retail evolution with environmental changes (e.g., an increasing living standard) and inter-institutional conflicts. *Combination of Environmental, Cyclical and Conflict Theory* proposed a combination of all three retail evolution theories to explain evolutions of retail institution types (Hall, Knapp & Winsten, 1961; Kaynak, 1979; Shaw, 1978). focusing on food and clothing industries with statistical analysis providing insight into changes in gross margin (i.e., Cyclical theory), number of stores within a region (i.e., Conflict theory), and environmental variables (i.e., Environmental theory). *Combined Retail Evolution Model* (CREM) synthesized the previous retail evolution theories and consumer patronage theories into a better model to fit all types of retail evolution (Kim, 2006). The CREM shows retail institution types in a change process of three principles: (a) rhythmical patterns of spiral change, (b) the effects of conflict or challenge from competition, and (c) the influence of retail environments.

**TABLE: OVERVIEW OF THE THEORIES OF RETAIL CHANGE**

Theory	Key Hypothesis	Implications	Limitations	Comments
Wheel of Retailing	low-price, low-quality operations 'trade-up' to become high-price, high-quality operations	Widely observed in many areas of retail change, in particular in high-level, developed economies.	Not applicable to all areas, even in the US and the UK. Not applicable to countries with low-level economies.	Has received the most academia attention, but addresses only one aspect - trading up. Numerous causes of trading up advanced, but no consensus

				reached.
Retail Accordion	Wide-range, general retail operations give way to narrow-range, specialized retail operations, which in turn give way to wide-range. General retail operations, and so on.	Successfully applied to many areas of retail change, but these are Concentrated in the USA and Europe.	Not applicable to all areas, several cases of non-application, even in the USA and Europe	Again, addresses only one aspect - cycle in which traders alternate between specialization and diversification. Less academia scrutiny than Wheel, but many causes proposed
Polarization Principle	The growth of large institutions creates a market for small, convenience stores, located near to people's homes.	Successfully applied to several countries, notably the USA, the UK, Western Europe and Japan	Has not received sufficient academia attention for cases of non-application to arise.	Has not received large amounts of academia attention, and again addresses only one aspect - the relationship between large and small stores. Limited debate on causes of the process.
Multi-polarization model	Suggests that developments at one end of the price, assortments or service level spectrum will induce counterbalancing activities at the opposite end.	Has not received sufficient academia attention for cases of application to arise, although those of the Wheel, Accordion & Polarization Principle remain valid	Has not received sufficient academia attention for cases of non-application to arise, although it must suffer the same criticisms as the Wheel, Accordion & Polarization Principle.	Combines the Wheel, Accordion and Polarization models, but is not thoroughly tested itself. Addresses multiple aspects of retail change, and retains conceptual clarity.
Retail Life Cycle	An institution goes through stages, or life cycles, from birth, through to growth, maturity and decline	Valid for many retail formats in the USA, but has received little academia attention.	Has not received sufficient academia attention for cases of non-application to arise.	Not thoroughly tested Observed parallel with the wheel of retailing. Limited academia

				attention means few causes have been advanced.
Big Middle	Retail institutions originates as innovative offerings or low-price retailers and ultimately transform into Big Middle	US retail perspective has been considered as for example	Consumer behavior perspective is ignored	It illustrates how retail institutions initiates and change over time
Conflict or Dialectic Theory	Retail change is a result of negation of competitors' advantages. In time, mutual adaptation takes place. "If you can't beat them, join them" (Mason and Maycr, 1990)	Part synthesis observed in UK food retailing, and other markets.	Full synthesis not yet observed	Easy to envisage. Observed, at least in part. Fails to account for the influence of the operating environment.
Environmental or Darwinian Theory	The reaction of individual institutions to changes in their environment is the key to survival. "Survival of the fittest"	Has not received sufficient academia attention for cases of application to arise.	Has not received sufficient academia attention for cases of non-application to arise.	Not thoroughly tested. Easy to envisage, but in many ways a statement of the obvious, with no clearly stated cause of process.
Combined Theory	Synthesize all the retail evolution models	CREM model is proposed in application for Korean perspective	Much attention has not drawn	Tried to minimize the flaws of other theories

Source: Adopted and Modified from Clough, Roger (2002)

## 5: Contemporary Issues in Retailing:

**5.1: E-tailing:** E-tailing is conducting the retail on online. The researchers defined e-tail in many ways, as for example, e-tail has been defined as the selling of goods and services to the consumer market via the internet (Wang F and Head M, 2002; Turban et al. 2006) whereas Harris and Dennis (2002), explained e-tailing as the sale of goods and services via Internet or other



electronic channels, for personal or household use by consumers. However, the e-tailing encompass three main activities-a product search facility, online purchase function and product delivery capability (Kolesar and Galbraith, 2000). The advent of the internet has dramatically changed the retail landscape (Ravindra et al., 2018). In the US, the e-tailing contributed 6.4% increase in total sales and expects a strong growth forecast (M&A International Inc. 2010), in Australia, e-tailing has witnessed steady growth of 50% to 60% over the years and accounts for about 10% of the overall growth of e-commerce market (Xu Jun, Gao Xiangzhu and Hammond John, 2017), throughout the Asia Pacific and especially in China e-tailing is growing rapidly (McKinsey Global Institute, 2013) and the e-tailing, growth in china has got a huge momentum over the last years (Liang Bo, Cline Thomas, TuYanbin and Ma Zhongyu, 2016) and contributed more than \$US190 billion in 2012.

**5.2: Multichannel Retailing:** The concept of channel combination in retailing is commonly referred to as “multi-channel retailing” (MCR), which has been recognized by retailers of all kind as a strategic marketing program (Kim and Park, 2005). Around the world, retailers have advanced in their use of multiple channels and have replaced traditional model structures with multi-channel models (Lassalie 2012; Koistinen and Jarvinen, 2009; Rao et al., 2009) and sometimes multichannel retailers are out-performing online-only (“pure-play”) retailers, and that their success is reflected in their market value (Vishwanath and Mulvin 2011). The use of multiple channels in retailing has been rising (Dakora and Andy, 2013; McGoldrick & Collins, 2007) due to potential for sales growth, extended market coverage and meeting customers’ expectations (Coelho et al., 2003). In a recent benchmark study, all of the large retailers and 94% of the “winners” (defined as the retailers with the best financial performance) were multichannel operators (Kilcourse and Rowen 2008). The rapidly changing consumer behavior and a growing market for online retail, retailers in the UK and elsewhere in the world are embracing the concept of multi-channel retailing (Capgemini, 2013).

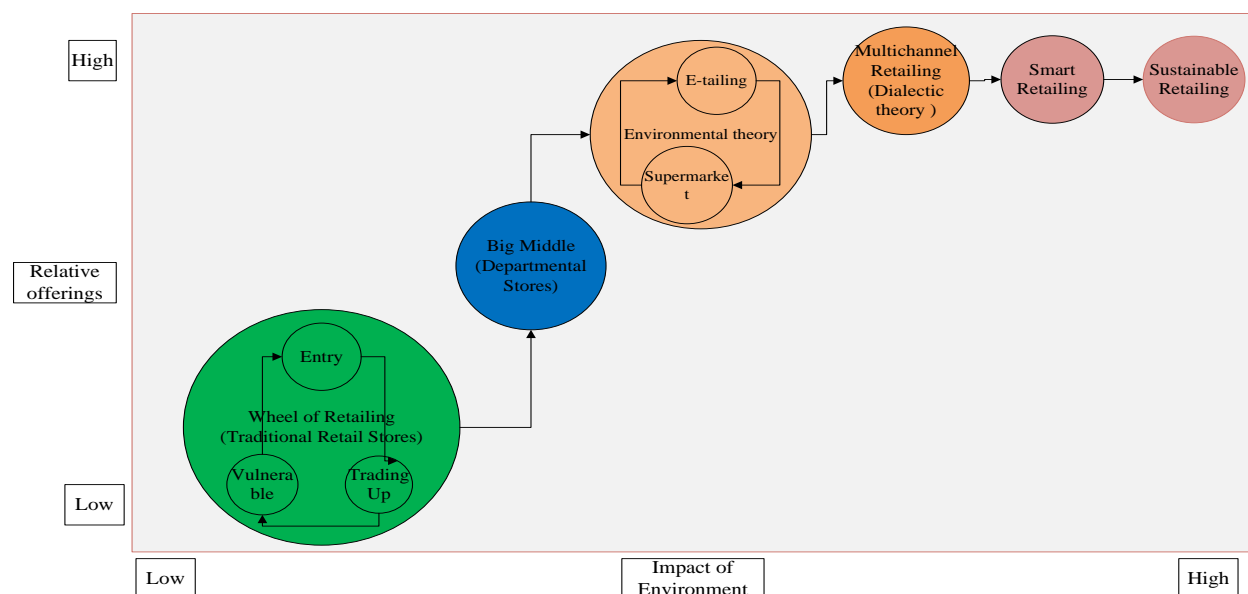
**5.3: Smart Retailing:** The technological development and implementation of the technology in the retail sector causing the tremendous changes in this sector (Pantano et al., 2017) and the concept of ‘smart retailing’ emerged. The idea of smart retailing has been defined by many researchers, as for example, Roy et al. (2016) stated as collaborating and interlinked retail process which supports the continuous management of customer touchpoints for personalizing the customer experience to excel the performance and Pantano and Timmermans (2014) demarcated as a new competitive scenario for retailers shaped by the usage of smart technologies to involve consumers in efficient and satiating shopping experiences. However, the implication of new technologies in retailing is benefiting to both consumers and retailers (Pantano & Timmermans, 2014) and has transformed the consumer-retailer interactions (Kim et al., 2017; Pantano & Priporas, 2016; Pantano & Viassone, 2015; Voropanova, 2015; Yadav & Pavlou, 2014). For example, the introduction bar code and RFID technology enables the retailers to store more data about the product and customers and RFID technology is becoming the key driver to change the retail (Blazenka Knezevic, Mia Delic and Matija Cegnar, 2011). Retailers have notably integrated in-store technologies like, the integration of self-service technologies (SST’s) into the retail process i.e. self-scanning and self-checkout (SCO) that allow consumers to scan products and make payments themselves (Nathalie et al., 2016), have emerged as a method to support the retail process (Lai and Chuah, 2010) and causing the changes in retail business. The mobile revolution has driven change from the traditional to multi-channel to Omni-channel retailing. This technology also created a notable shift from the division of physical

and online retailing, to the free movement amongst online, mobile and the physical store within a single transaction process (Piotrowicz and Cuthbertson, 2016). Moreover, the social networking site has become a vital channel for retail, as customers increasingly trust other consumer's opinions rather than the opinions of institutions. Getting customers to share and talk about their experiences is a vital part of the communications strategy (Clements, 2014).

**5.4: Sustainable Retailing:** The sustainability issue become a global phenomenon in recent years and the scholars have used the different approaches to define sustainability (Labuschagne et al, 2005). However, according to the Triple Bottom Line approach (Elkington, 1998), the sustainability explained as the attainment of the economic, environmental and social goals comprehensively. The sustainability practices of the business are becoming the great concern for the customers now a days and they are looking for the eco-friendliness and ethical practices of business offerings (Trudel & Cotte, 2009; Steinrücken & Jaenichen, 2007; Newholm & Shaw, 2007) and the retailers need to incorporate sustainability issues in their business as now days it becomes the most priority by the retailers (The Consumer Goods Forum, 2011). The retailers' ensure the sustainability in playing important role in managing the supply chains. For this purpose, they set the standards of the products related to the sustainability (Brammer, Hojmoser, & Millington, 2011) and ensure the green products not only in the supply chains (Jones, Comfort, & Hillier, 2008), but also confirm the sustainable behavior in the production process by managing the logistics, packaging, or assortment and as they deal with the consumers directly, they are able to push the sustainability issues like the food safety as well as promote and encourage changes in consumer behavior that improve social and environmental issues (Durieu, 2003).

## 6. The Retail Change Model for Bangladesh:

Based on the retail change theories and contemporary issues in retailing, a new model of retail change named “**Contemporary Model of Retail Change (CMRC)**” for Bangladesh perspective has been proposed in the figure-1



**Figure1: Contemporary Model of Retail Change (CMRC)**

The above model shows that the evolution of retail institutions are based on two factors, the relative offerings of the retail organization and the impact of environment on the retail

organization-both are might be either high or low. The traditional retail business are low offering business and low concern about the environmental aspect. But as the peoples need for more merchandise increase and the influence of environment the business rises, these traditional retail business fails to cope with the situation and new forms of retail institution (Departmental stores) evolves. So, the traditional retailers follow the wheel of retailing theory. Since the departmental stores are appearing with moderate merchandise offering and environmental influences, they exists but the influences of globalization, technology development and economic development, the consumers seeks for the more services from the retailers and as a result, the supermarkets and e-tailing emerged and the departmental stores follow the big middle theory. It is mentionable here, as the e-tailers' enjoys the more technological advantages they has the opportunity to offer more merchandise than the supermarkets. These two forms of retail institutions are in conflict in gaining the high market share but since only single channel is not the key to be successful (Reference) the supermarkets and e-tailers' joins together and form the multi-channel retailing which matches the assumptions of the Dialectic theory. The advancement and implementation of the technology in the retail sector causing the tremendous changes in this sector (Pantano et al, 2017), the 'smart retailing' emerged. As the principles of sustainability are enforcing the business organizations promptly, the sustainable retailing emerged at the end of this evolution process.

## 7: Implication of the Model

The history of spatial retail growth of Bangladesh especially, Dhaka, explained a study (Hossain, 2014), categorizing growth of retail in as per the of Pre-Mughal Hindu Period (Before 1608), Mughal Period (1608 - 1764), The Rule of the East India Company (1764 - 1857), British Colonization (1858 - 1947), Pakistan Period (1947-1971) and Bangladesh Period (1971 - 2014). On the other hand, in describing the practicing retail types in Bangladesh researchers categorized the retail business of Bangladesh into four types- the Open air and traditional roadside shops, Municipal corporation mini-markets, Departmental or convenient stores and organized retail stores (Datta, 2017; Ahmed, 2017). The Wholesale and Retail Trade Survey 2009-10 (BBS, 2013) mentioned that the total 2650123 retail establishments exists in Bangladesh among which individual ownership holds 2125482 organization, partnership organizations are 489505, private organizations are 32997 and other types of ownership holds 2139 retail business units whether the Economic Census-2013 (BBS, 2015) registered 2540688 retail establishments, among those individual and family business are 2459435, partnership 18901, private Ltd 56358, Public Ltd. 77, Government & Autonomous are 291, Foreign & Joint Venture are 71, Co-operatives are 664, others are 4303. However, the retail industry of Bangladesh has been dominating by the traditional retailers', but the sector is observing remarkable changes since the few decades (Siddiqui, Ahmed and Hasan, 2006; Arif, 2013, Ahmed, 2017; Sarker and Ashrafi, 2018; Islam Md. Shafiqul, 2018; Babar Z. M, 2017; Oishe S. F, 2017). Thus the implication of retail change theories in Bangladesh are illustrated as per the proposed model in the way that, the traditional retailers in Bangladesh follows the wheel of retailing theory and as they offer low assortments, eventually they are in vulnerable situation which results new forms of retail institutions-the departmental stores. Due to the increasing impact of environment and changes in the customers need, the departmental stores are offering medium ranges of merchandises to the society and matches with the assumptions of the big middle theory. The environmental forces like the globalization, economic and trade liberalization, the growth of FDI and GDP (Islam M K 2019; Datta P R 2017), the changing patterns of consumers 'buying behavior, the growth of

urbanization, significant increase of middle class consumers, the rise of nuclear families, coupled with the invasion of women in the workforce (Shahid, B R, 2017; Shamsher R, 2017) along with the westernization through the exposure to foreign culture and growing preferences for the use of plastic money (Hossain M A, 2017) etc. has accelerated the rise of supermarket in Bangladesh in early 2000s (Ali and Faroque, 2017; Shamsher and Hossain, 2011) though it has been diffused since 1990s (Azad, Hossain and Parveen, 2012). In the last eighteen years, many small and big superstores have started their retailing business in the large cities like Dhaka, Chittagong, Sylhet, Cumilla and Mymensingh etc. to attract middle and upper middle class consumers, segments which are shifting their shopping preferences to the super stores from the traditional markets. (Shamsher and Hossain, 2012, Farid et al, 2018) and now at present, there are 208 supermarkets operating in Bangladesh (BSOA, 2018) by offering the huge merchandise to the shoppers under a single roof. On the other hand, as the consumer willingness to try online services (Al Noor & Arif, 2011), the government initiative of 'Digital Bangladesh by 2021' (a2i, 2009), local and foreign investment from the private sectors (World Bank, 2014) and the growth of the ICT sector (Bank, 2015; KPMG, 2012; Nyenrode, 2014) are quickening the speedy growth of e-business and e-tailing in Bangladesh. As per the e-Commerce Association of Bangladesh (NewAge, 2018), over 715 businesses are members of e-CAB, which delivered 30,000 products in 2017 and transacted Tk 1,800 crore and currently country's total e-commerce market size is more than Tk 2,000 crore a year and that is growing at 40 to 50 percent annually (The Daily Star, 2018). In addition, there are 1,000 e-commerce-based sites and 10,000 Facebook pages that run online based businesses as 3G internet 3-4 years back led to rapid adoption of online shopping. But in today's highly dynamic business environment, it is very shaky in conducting business based on single channel, i.e. only the supermarket or the e-tailing and now the business organizations are taking initiatives for establishing the multichannel retailing in Bangladesh. Hence, the supermarket chains are stepping into the e-commerce bandwagon to meet the growing demand for convenience in shopping for perishables and other consumer goods (The Daily Star, 2017). The retail chain SHWAPNO is also started the e-channel in aiming to become the country's largest Omni channel retailer (future startup, 2017), Meena bazar launched their online platform named meenaclick (<https://www.meenaclick.com/>). As the people's intention to use more sophisticated technologies in the shopping behavior and in the daily life, the retailers need to turn into the smart retailing which is observing in the country's largest malls like the Jamuna Future Park, Bashundhara City etc. Finally, the sustainable concept in retailing is increasing in Bangladesh, according to the recent Global Green Economy Index (2019), Bangladesh is ranked 124 out of 143 countries with score 0.3941 for the year 2016-2018 and the yearning in buying sustainable products has grown significantly here as like many other developing countries. In a research (Zahan and Wade, 2018), it is found that the 90% of consumers of the supermarkets are aware of organic products i.e. the product that do not harm the environment expecting to purchase at competitive prices and the supermarkets in Bangladesh are trying to achieve competitive advantage through sustainability practices.

### **8: Limitation in implementing of the Model**

In implementing the model, there have some limitations. At the very first, the retail industry of the country is dominated by the traditional retailers and the sector is fragmented and unorganized. The supermarket industry is growing sharply but the government do not have any specific regulation to manage the sector. Moreover, imposing VAT on the purchase from the organized retailing discourages the customer to purchase from this types of store, resulting the

sales fall of this sector (future startup, 2019). On the other hand, though the practices of e-commerce and e-tailing is rising in the country, among the 164.6 million people of the country (BBS, 2019), only 98.429 million people have the internet access (BTRC, 2019) which is a great challenge in ensuring effective e-tailing and smart retailing in the country. Similarly, in case of sustainability and environmental friendly business practices, Bangladesh ranked 179 out of 180 countries in Environmental Performance Index with score of 29.56, Environmental health score 11.96 and ecosystem vitality score 41.29 (EPI, 2018) which depicts that the country is far away from sustainability practices.

**9. Strategies to overcome the limitations:** A few strategies can ensure the successful attainment of the Contemporary Model of Retail Change (CMRC). At the very first, the supermarkets are growing in the country but they are concentrating on the large cities only, so they need to expand their business all over the country and the government would have to take policies for effective spread and control of this business. Secondly, the availability of internet, awareness as well as educational training programs on the use and application of internet in shopping behavior may also ensure the high adoption of e-tailing and smart retailing. The sustainable business practice and environmental performance of the Bangladeshi business organizations are in initial stage. The government should ensure the sustainable retail by initiating and implementing the proper policies in this regards.

## 10. CONCLUSION

Retailing is one of the oldest business of the world. This business is going through the transformation process since long over the world due to the changes in business environment. The theorists explained multi-dimensional approaches retail institutional changes most of which are based on the developed country perspective, and even did not much focus on the contemporary issues like the channel combination and sustainability perspective. In Bangladesh, the retail business has a long heritage and it is one of the main sources of employment. Keeping pace with the retail changes over the world, the retail industry of Bangladesh is changing. On the basis of the limitations of the renowned retail change theories and along with the contemporary issues of retailing like the e-tailing, multi-channel retailing, smart retailing and sustainable retailing, the new retail change model for Bangladesh perspective has been proposed considering the two indicators, relative offerings and the impact of environment on retail business. The model shows that though the retail industry of Bangladesh is dominated by the traditional retailing which follow the wheel of retail model, the industry is changing and now the supermarkets and e-tailing are rising as a result of their ability to offer huge offerings and high impact of environmental issue on the retail business. The transition situation is ongoing and the remarkable evolution of the multi-channel retailing, smart retailing and sustainable retailing also growing in the country. Though the retail business is emerging towards the contemporary business models, huge number of population till do not have the internet access and the country is far away from the sustainable business attainment which are the main challenges of modern retail business in Bangladesh.

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## **A STUDY ON EFFICIENT MARKET HYPOTHESIS IN IT CONSULTING AND SOFTWARE SECTOR IN INDIAN STOCK MARKET**

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### **ABSTRACT**

*The corporate announcements have significant effect on the shareholder's decision and hence it is often reflected in the prices at which the shares of the companies are traded. The objective of this paper is to study the informational efficiency of the shares of IT Consulting and Software Sector listed in Indian Stock Market. The event considered is the bonus issue announcement made by the selected companies belonging to IT Consulting and Software Sector during September, 2001 to August 2019. The empirical analysis has indicated that the bonus issue announcements had less impact on the EMH assumption of the market with respect to IT Consulting and Software Sector. When CAAR is taken as the excess return expected, there is significant impact on the share prices and returns in the selected firms.*

**KEYWORDS:** *Corporate announcements, Informational Efficiency, Efficient Market Hypothesis (EMH), Average Abnormal Return (AAR), Cumulative Average Abnormal Return (CAAR).*

### **INTRODUCTION:**

Stock market plays a significant role in the growth and development of the economy. Share market is also one of the primary sources of funds for the going concern. Since the resources are scarce, the one who bids higher gets access to the available resource. The market is believed to operate efficiently only if it allocatively efficient, operationally efficient and informationally efficient. In Efficient Market Hypothesis (EMH), it is assumed that the market is allocatively and operatively efficient and tested for its informational efficiency.

The price of the share is assumed to reflect fully and instantaneously all the information available relevant to the share. If the share price subsumes all relevant information, then the market price will be equal to the fair price of the share or fundamental value. If EMH is true, the securities market will be in continuous stochastic equilibrium and explain EMH using fair game model.

The shareholders' investment decision depends on the return on investment made by them through capital gain and dividend received. When the investor anticipates an announcement from the entity, the demand for the share changes, which in turn affects the price of the share. Thus an informatically efficient market (SupriyaSardana et al., (2018)) is the one where the stock prices react rapidly to any new corporate information. Though the long term trend of the share price is determined through changes in macro and micro economic variables, one of the major factor affecting short term fluctuation are the corporate announcements. Thus Event study has been a major focus for the analyst to anticipate the share price adjustments.

### **REVIEW OF LITERATURE:**

Fama (1965, 1970) argued that expectations can be conditioned on three sets of information namely; weak form information set, semi-strong form information set and strong form information set. Jensen (1978) defined efficient market as the one in which prices reflect available information only to the extent that the marginal benefits of exploiting the information exceed the transaction cost incurred.

Suresha B et al., (2016) attempted to verify the informational efficiency of stocks listed in Nifty. Bonus issue, stock split and right offers were the events considered for the even study. The empirical study confirmed that the market in India is semi strong efficient on overall basis.

SupriyaSardhanaet al.,(2018) tested the efficiency of stocks listed by hotel industry. The serial correlation test indicated that the residual of stock is not correlated, hence there exists a weak form of efficiency of hotel industry.

Charles Lasrado., et al., (2009) used Kolmogorov – Smirnov test to determine the change in distribution of abnormal returns before and after the announcement on bonus issue. The test evidenced that the NSE is efficient at semi strong form.

Poornima B. G. et al., (2019) studied the impact of dividend announcement of bank on stock returns. The t-test was used to find whether there is difference in the stock return before and after the dividend announcement. Except in rare cases, most of the public sector banks had more significant negative impact during post and pre announcement period.

Shahid Ashraf et al., (2019) investigated the impact of annual budget on the average return of the stocks in CNX Nifty 100 during the period of 2000 – 2016. The empirical study found that the Betas estimated from the model showed significant variability over the study period both before and after budget across firms of different industries. The AER and CAER proved that the market is efficiently inefficient as the market's informational efficiency was though semi-strong, but had some opportunities to earn abnormal profit.

### **DATA AND METHODOLOGY:**

There are several research attempts investigated the informational efficiency of the stock market. In this line of research, this paper attempts to explore the efficiency of the shares of the firms belonging to IT consulting and software sector in Indian Stock market. The study period is



between September 1, 2001 to August 31, 2019. The event considered is the Bonus issue announcement made during the study period by the IT consulting and software sector in Indian Stock market. The event window is 61 days, which includes 30 days prior to the record date, the record date and 30 days post record date. The market model was used to estimate the normal returns and the estimation window considered was 180 days prior to 61 days event window.

**TABLE 1: TABLE SHOWING THE RECORD DATE, EVENT WINDOW AND ESTIMATION WINDOW CONSIDERED FOR ANALYSIS**

Security Code	Security Name	Company Name	Record date	Event Window (61 days)	Estimation Window (180 days)
532175	CYIENT	Cyient Limited	21.04.2010	08.03.2010 to 03.06.2010	05.09.2009 to 05.03.2010
532129	HEXAWARE	Hexaware Technologies Ltd.	11.01.2011	26.11.2010 to 23.02.2011	09.06.2010 to 26.11.2010
532400	BSOFT	Birlasoft Ltd	23.01.2012	13.12.2011 to 06.03.2012	24.06.2011 to 12.12.2011
533179	PERSISTENT	Persistent Systems Ltd.	24.01.2015	12.12.2014 to 10.03.2015	12.06.2014 to 11.12.2014
532281	HCLTECH	Hcl Technologies Ltd.	30.01.2015	16.12.2014 to 16.03.2015	17.06.2014 to 16.12.2014
532755	TECHM	Tech Mahindra Ltd.	20.01.2015	05.12.2014 to 04.03.2015	06.06.2014 to 05.12.2014
532819	MINDTREE	Mindtree Ltd.	18.01.2016	03.12.2015 to 03.01.2016	10.06.2015 to 03.12.2015
532540	TCS	Tata Consultancy Services Ltd.	19.04.2018	05.03.2018 to 01.06.2018	08.09.2017 to 05.03.2018
500209	INFY	Infosys Ltd.	13.07.2018	31.05.2018 to 28.08.2018	13.10.2017 to 10.04.2018
507685	WIPRO	Wipro Ltd.	18.01.2019	05.12.2018 to 01.03.2019	05.12.2018 to 08.06.2018

The weak form of efficiency is tested using the serial correlation test. Serial correlation is used to test the random walk hypothesis, i.e., the returns of the share cannot be predicted from the past returns, they should be serially uncorrelated. In order to test the serial correlation (Auto-correlation), Durbin-Watson Test and Breusch Godfrey-Lagrange Multiplier (LM) tests are used:

$$DW = \frac{\sum_{t=2}^T (e_t - e_{t-1})^2}{\sum_{t=2}^T (e_t)^2}$$

Where  $e_t$  are residuals from an ordinary least squares regression. If the value of DW test ranges between 0 and 4. The value equal to 2 proves that the series is not serially correlated. The value between 1 and 3 is indecisive, hence LM test is used. LM tests the residual obtained from Ordinary Least Square (OLS) method. If the significance value is less than the  $\alpha=0.05$ , the null hypothesis of no autocorrelation in the residual series is rejected.

The expected return of the security is calculated using the market model,

$$E(R_{it}) = a_i + b_i R_{mt} + E_{it}$$

Where  $E(R_{it})$  is the expected return of  $i^{\text{th}}$  security on the day  $t$ ;  $R_{mt}$  is the market return on day  $t$  and  $E_{it}$  is the residual obtained.  $a_i$  and  $b_i$  are the intercept and co-efficient respectively.

The actual return ( $R_{it}$ ) of the shares are calculated using  $R_{it} = \ln(P_{it} - P_{i(t-1)})$ , where  $P_{it}$  is the price of the  $i^{\text{th}}$  share on day  $t$  and  $P_{i(t-1)}$  is the price of the  $i^{\text{th}}$  share on day  $(t-1)$ .

The Abnormal return (AR) is the difference between the actual return of  $i^{\text{th}}$  security on day  $t$  and the expected return of  $i^{\text{th}}$  security on the day  $t$ . the Average Abnormal Return (AAR) is the average of AR of  $N$  securities on the  $i^{\text{th}}$  day. The cumulative average of abnormal return (CAAR) is calculated by adding successive AAR.

The t-test has been used to test whether the AAR and CAAR is significantly different from 0 at 5% level of significance. If the p value is greater than the level of significance of 5%, then the null hypothesis that AAR and CAAR is not significantly different from zero is accepted. Thus proving the Semi-strong efficiency of the share returns.

## RESULTS AND DISCUSSIONS:

### Testing the weak form of EMH:

The Durbin-Watson Test and Breusch Godfrey (LM) tests are used to test the auto-correlation of the return series.

### Serial correlation

**TABLE 2: DURBIN-WATSON TEST STATISTICS AND BREUSCH GODFREY (LM) TEST STATISTICS**

Security Code	Security Name	DW	LM test (p value)	Weak form
532175	CYIENT	2.04	0.395	Supported
532129	HEXAWARE	1.86	0.219	Supported
532400	BSOFT	1.98	0.493	Supported
533179	PERSISTENT	1.90	0.421	Supported
532281	HCLTECH	1.94	0.664	Supported
532755	TECHM	1.76	0.621	Supported
532819	MINDTREE	1.77	0.593	Supported
532540	TCS	1.86	0.743	Supported
500209	INFY	2.25	0.489	Supported
507685	WIPRO	2.41	0.206	Supported

The results of the Durbin-Watson Test and Breusch Godfrey (LM) tests, indicates that the return series of the securities are not serially correlated. Thus the test proves the existence of weak efficiency in the share prices of IT consulting and software industry. The corporate announcement of Bonus issue has no effect on the share prices during the event window, thus the investors cannot earn any abnormal profits.

### Testing EMH - Semi Strong Form

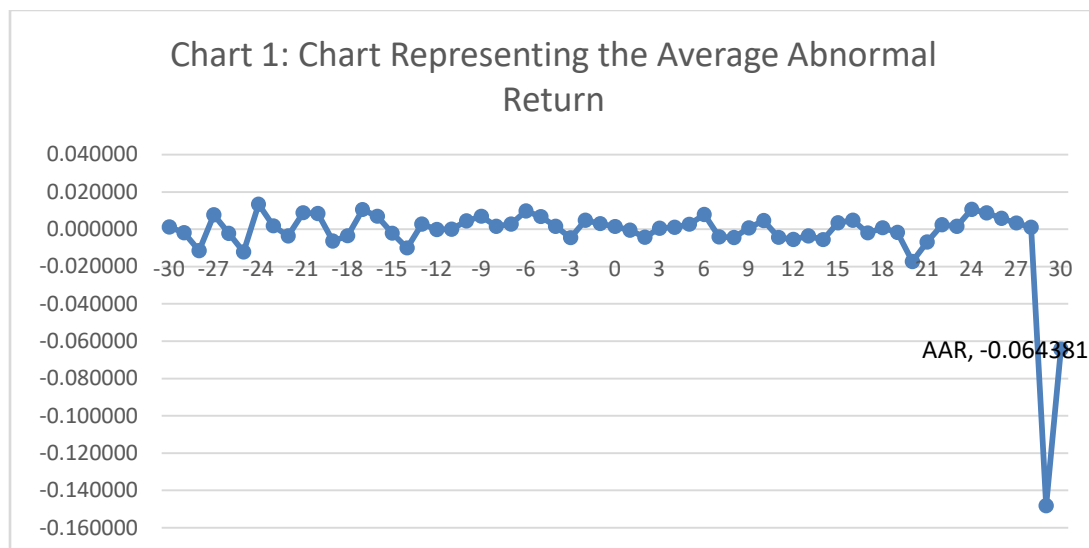
In order to test the semi-strong efficiency form of the market, the t-test is used. The process of testing includes the computation of actual return, estimated return using market model, Average Abnormal return and Cumulative Average Abnormal Return using the formula defined under methodology section.

The regression coefficients for calculating the expected return are as below:

**TABLE 3: TABLE SHOWING THE REGRESSION CO-EFFICIENT FOR CALCULATING EXPECTED RETURN**

Security Code	Security Name	Alpha	Beta
532175	CYIENT	0.001428	0.431079
532129	HEXAWARE	0.001401	0.306516
532400	BSOFT	-0.001147	0.605586
533179	PERSISTENT	0.002216	0.489109
532281	HCLTECH	-0.00064	1.162487
532755	TECHM	0.001154	0.69721
532819	MINDTREE	0.000392	0.82183
532540	TCS	-0.00025	1.121727
500209	INFY	0.001947	-0.05863
507685	WIPRO	0.001764	0.400403

The expected return calculated using the regression coefficients are then used to calculate the abnormal return and average abnormal return.



The null hypothesis formulated to test AAR is that, the ARR is not significantly different from Zero. The t-test is used and the results are as below.

**TABLE 4: TABLE SHOWING THE AAR, STANDARD DEVIATION OF AAR, T-STATISTICS AND P VALUES**

Day	AAR	STD(AAR)	t(AAR)	P-Value
-30	0.001037	0.015332	0.213822	0.835452
-29	-0.001987	0.013728	-0.45773	0.657994
-28	-0.011601	0.015601	-2.35137	0.043208
-27	0.007563	0.013035	1.834825	0.099728
-26	-0.002283	0.038231	-0.18882	0.854421
-25	-0.012313	0.018621	-2.09103	0.066073
-24	0.013279	0.040472	1.037556	0.326548
-23	0.001688	0.015339	0.348023	0.735825
-22	-0.003686	0.037071	-0.31445	0.760345
-21	0.008696	0.021347	1.288121	0.229834
-20	0.008282	0.033802	0.774767	0.458348
-19	-0.006402	0.014228	-1.42291	0.188487
-18	-0.003647	0.012016	-0.9597	0.362276
-17	0.010419	0.01588	2.074905	0.067823
-16	0.006830	0.026384	0.818593	0.434157
-15	-0.002244	0.024298	-0.29206	0.776861
-14	-0.010125	0.019027	-1.68266	0.126732
-13	0.002608	0.006864	1.201647	0.260165
-12	-0.000304	0.008054	-0.11928	0.907671
-11	-0.000095	0.014987	-0.02006	0.984432
-10	0.004300	0.018745	0.725335	0.486677
-9	0.006833	0.016125	1.339939	0.213111
-8	0.001443	0.014865	0.306981	0.765842
-7	0.002675	0.015025	0.562907	0.587245
-6	0.009648	0.042731	0.713986	0.493335
-5	0.006640	0.021089	0.995682	0.34542
-4	0.001465	0.016044	0.288761	0.779305
-3	-0.004650	0.01262	-1.16515	0.273908
-2	0.004727	0.012742	1.173225	0.270819
-1	0.002895	0.024251	0.37755	0.714515
0	0.001337	0.033347	0.126746	0.901928
1	-0.000665	0.032793	-0.06408	0.950306
2	-0.004376	0.010469	-1.3217	0.218877
3	0.000450	0.009015	0.157737	0.878146
4	0.000954	0.01862	0.161942	0.874929
5	0.002535	0.013213	0.60674	0.559016
6	0.007799	0.008999	2.740639	0.022824
7	-0.004256	0.01294	-1.04007	0.325441
8	-0.004626	0.009772	-1.49709	0.168593

9	0.000598	0.009365	0.201988	0.844418
10	0.004521	0.026124	0.547271	0.5975
11	-0.004503	0.009105	-1.56395	0.152267
12	-0.005560	0.012779	-1.37589	0.202124
13	-0.003678	0.010841	-1.07293	0.311227
14	-0.005690	0.010441	-1.72335	0.118919
15	0.003284	0.019288	0.538346	0.603396
16	0.004672	0.011301	1.307244	0.223539
17	-0.002064	0.010141	-0.64365	0.535857
18	0.000675	0.01013	0.210639	0.837861
19	-0.001855	0.012006	-0.48849	0.636882
20	-0.017440	0.018932	-2.91316	0.017222
21	-0.006955	0.017638	-1.24689	0.24391
22	0.002302	0.023055	0.315706	0.759424
23	0.001421	0.018217	0.246656	0.810708
24	0.010570	0.022213	1.504772	0.166641
25	0.008672	0.022571	1.214927	0.255305
26	0.005751	0.021556	0.843667	0.420713
27	0.003210	0.016214	0.626106	0.546794
28	0.000971	0.016421	0.186922	0.855867
29	-0.148190	0.318126	-1.47306	0.174827
30	-0.064381	0.233464	-0.87205	0.405846

The above table reveals that the AAR is significantly different from zero on 28<sup>th</sup> day before the event date and on 6<sup>th</sup> and 20<sup>th</sup> day after the record date. This indicates that the market has taken significant time to reflect the information. Hence the semi strong form of market is proved as the ARR is not significantly different from zero on most of the days in the event window.

Similarly, CAAR is also tested for understanding the semi strong informational efficiency of the market. From the t-test it is understood that CAAR is significantly different from zero on most if the days in the event window. Thus when CAAR is considered the market is inefficient in the semi strong form.

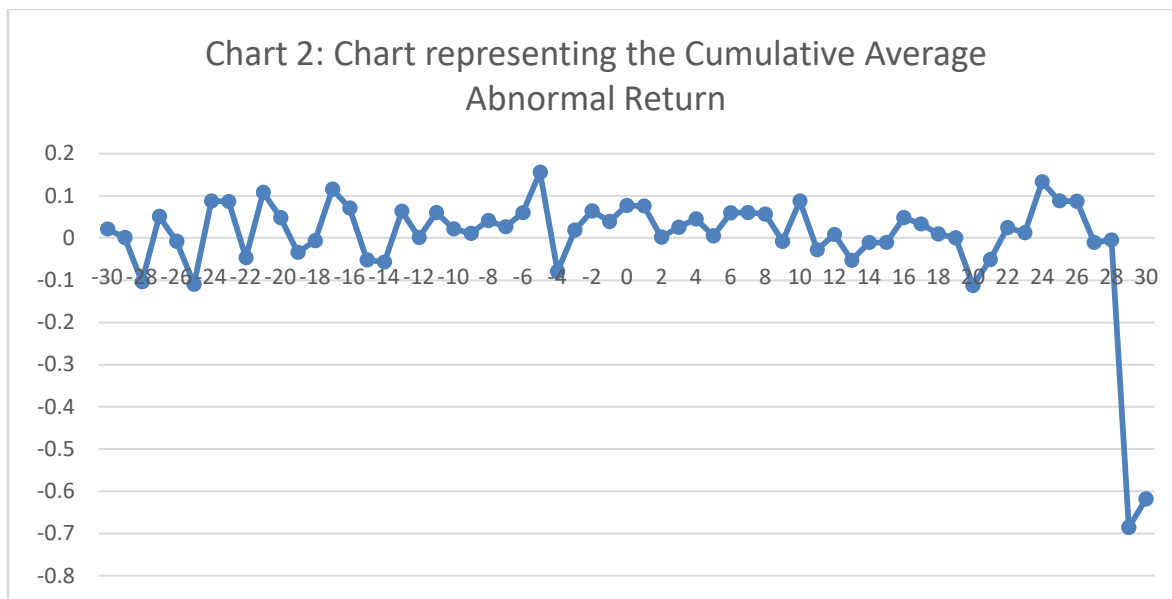
**TABLE 4: TABLE SHOWING THE CAAR, STANDARD DEVIATION OF CAAR, T-STATISTICS AND P VALUES**

Day	CAAR	STD(CAAR)	t(CAAR)	P-Value
-30	0.021231	0.017047	3.938451	0.003414
-29	0.000858	0.011024	0.246136	0.811099
-28	-0.10396	0.03703	-8.87772	9.55E-06
-27	0.051265	0.018782	8.631337	1.2E-05
-26	-0.00799	0.029399	-0.85974	0.412247
-25	-0.10988	0.034786	-9.98849	3.61E-06
-24	0.087641	0.033943	8.165044	1.88E-05
-23	0.086504	0.030149	9.073251	7.99E-06
-22	-0.04657	0.026934	-5.46791	0.000396



-21	0.108189	0.029845	11.46315	1.14E-06
-20	0.048103	0.026669	5.703816	0.000293
-19	-0.03414	0.016989	-6.35462	0.000132
-18	-0.00628	0.012893	-1.54025	0.157885
-17	0.115494	0.036617	9.974289	3.66E-06
-16	0.070585	0.038998	5.723612	0.000286
-15	-0.05205	0.034664	-4.74866	0.001046
-14	-0.05691	0.028104	-6.40381	0.000125
-13	0.063572	0.025879	7.768091	2.8E-05
-12	0.001259	0.012936	0.307687	0.765322
-11	0.060192	0.024064	7.909851	2.42E-05
-10	0.021794	0.020149	3.420396	0.007623
-9	0.011087	0.018852	1.859744	0.095853
-8	0.041486	0.014387	9.11833	7.67E-06
-7	0.026413	0.016395	5.094657	0.00065
-6	0.059856	0.027894	6.785614	8.03E-05
-5	0.155878	0.068276	7.219675	4.98E-05
-4	-0.07906	0.0262	-9.54202	5.28E-06
-3	0.018398	0.017089	3.404393	0.007819
-2	0.064082	0.015802	12.824	4.36E-07
-1	0.03894	0.009518	12.93755	4.05E-07
0	0.076983	0.038427	6.335182	0.000135
1	0.075839	0.041243	5.814935	0.000255
2	0.001826	0.017922	0.322139	0.754704
3	0.025286	0.016702	4.787528	0.000991
4	0.044924	0.029915	4.748833	0.001046
5	0.004682	0.018103	0.817899	0.434534
6	0.059571	0.021957	8.579678	1.26E-05
7	0.060463	0.029321	6.520889	0.000109
8	0.056446	0.02561	6.96975	6.54E-05
9	-0.00821	0.014238	-1.82299	0.10162
10	0.08729	0.032818	8.410951	1.48E-05
11	-0.028	0.010352	-8.55406	1.29E-05
12	0.008288	0.017012	1.540596	0.157803
13	-0.05301	0.020222	-8.28974	1.66E-05
14	-0.01074	0.009835	-3.45284	0.007242
15	-0.0107	0.013924	-2.42903	0.038043
16	0.047839	0.022311	6.780423	8.08E-05
17	0.033221	0.014426	7.282457	4.65E-05
18	0.009528	0.008013	3.759971	0.004485
19	0.000508	0.0104	0.15441	0.880693
20	-0.1125	0.036376	-9.77948	4.31E-06

21	-0.05101	0.021107	-7.64276	3.18E-05
22	0.024487	0.01902	4.071105	0.002795
23	0.012563	0.014092	2.819033	0.020079
24	0.133274	0.048119	8.758407	1.07E-05
25	0.087921	0.021623	12.85783	4.27E-07
26	0.086995	0.041494	6.630008	9.59E-05
27	-0.01076	0.017412	-1.95478	0.082332
28	-0.00462	0.021854	-0.66836	0.520673
29	-0.68596	0.331081	-6.55189	0.000105
30	-0.61841	0.333126	-5.87039	0.000238



## CONCLUSION:

The corporate announcements are expected to shake the efficiency of the market. The firms make some break through announcements to influence their share price. There are several studies in favour of EMH and equal amount of empirically proves researches disproving the informational efficiency of the market. The bonus issue announcement is expected to impact the minds of the investors thus influencing the increase in share price and returns. But this paper has evidenced that the bonus issue announcements made by the IT consulting and software firms during the study period has less impact on the EMH assumption of the market. But when CAAR is taken as the excess return expected, then there is significant impact on the share prices and returns in the selected firms.

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## **MARKET MAKING MECHANISMS FOR DEVELOPMENT OF NON-FINANCIAL CORPORATE RETAIL BOND MARKET OF INDIA– AN EMPIRICAL STUDY**

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### **ABSTRACT**

*The silver lining of the corporate Bond Market globally could be visible during the 2008 financial crisis period. In some of the European countries and United States (US), multiple reforms in the corporate Bond Markets were carried out leading to significant growth of the corporate Bond Markets. Globally the average Non-Financial Corporate (NFC) Bond issuances increased to USD 1.7 Trillion per year from the years 2008 to 2018 as against USD 864 Billion per year during the years leading to financial crisis till 2008. The outstanding NFC Bonds were USD 13 Trillion at the end of 2018 which was double the outstanding NFC Bonds in 2008. The Retail Bond Markets were created in most of the nations with distribution of Retail friendly Government Bonds. In India, during the Forties, Fifties and early Sixties the Retail household investors invested largely in Retail Government Bonds. The NFC Retail Bond Markets are success stories in some of the European countries including London stock Exchange in United Kingdom (UK) and US. In India, despite path breaking initiatives of the Government and the Regulators, the liquidity in the secondary corporate Bond Market in absence of active Retail investors remain shallow. It has become essential for India to channelize the Household savings to the capital Market with its robust target of becoming USD 5 Trillion economy within 2024-25. The retail individual investors are also looking for alternatives to Bank Deposits and Small savings schemes with successive reductions of interest rate in these traditional investments. Though there are many research studies on development of corporate Bond Market and Household investors' investment preferences, in general, studies focused on development of Retail segment of NFC Bond Market in India are hardly available. The Government has though created Debt segment in stock Exchange, yet the same is not active and liquid till date. This Paper analyses the Market Making Mechanisms (Market Makers and Market Infrastructure) and Regulations in the successful NFC Retail Bond Markets of the (i) European countries with focus*

*on Italy and UK (London Stock Exchange) and (ii) US, based on secondary data. The attractiveness of these Market Making Mechanisms drawn from Global lessons, to the Retail individual investors of India have been then measured through Questionnaire in Five Point Likert Scale based on Primary survey of 447 respondents out of 500 individuals selected on random basis from six districts of West Bengal. Results reveal that significant percentage of retail individual investors have likeliness for Commercial Banks, Online Financial Advisors' Network, Registered Stock Exchange Brokers, Post Office Banks and Merchant Bankers as 'Dedicated Market Makers for Retail Bonds'. Again, 'Dedicated Infrastructure for NFC Retail Bond Market' with easy access to online and physical Buy and Sell Points, online trading platform, onscreen transparency of transactions, creation of Special Purpose vehicles by Dealers and online Multiple Trading Facilities are the top five choices of the retail individual investors for attracting their direct investment in NFC Retail Bonds.*

**KEYWORDS:** *Non-Financial Corporate, Retail, Bond Market, Individual Investors, Market Mechanisms. JEL Classification:* G 10, G 15, G 18, G 20, G 24, G 28

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## 1. INTRODUCTION

The 2008 Global Financial crisis was a silver lining for the upsurge of the Non-financial corporate (NFC) Bond Market globally. The average NFC Bond issuances globally increased to USD 1.7 Trillion per year during the period 2008 to 2018 as against average of USD 864 Billion per year since the beginning of the financial crisis till 2008. The outstanding NFC Bond stood at USD 13 Trillion at the end of 2018 being double the outstanding amount in real terms in 2008. Increase in borrowing through Bond route by the NFCs was witnessed in UK, France, Japan and Korea. The paradigm shift to corporate Bond Market was noticed in China from pre-crisis period to the post-crisis period. In many economies the increase in the use of the corporate Bond Market by the Non-financial companies for raising long term fund and positioning 'Bonds' as an attractive new asset class to the investors has been stimulated by regulatory initiatives. In 2013 two thirds of the Global issuances were made by the NFCs (OICU-IOSCO, 2014).

Most of the nations have taken measures for issuances of Government Bonds to the Retail investors with retail friendly structure, smaller denominations etc. In US and Brazil there are web-based platforms dedicated for Retail Bonds. London Stock Exchange (LSE) ORB (Order Book for Retail Bonds) has been a success model for development of NFC Retail corporate Bond Market. In Singapore the Retail Government Bonds are distributed through ATMs. Surprisingly, India has also a history of issuances of Retail Government Bonds in the Forties, Fifties and early sixties. During the fifties in India, almost half of the Government Bond issuances were held by the Household investors (BSE). Notwithstanding its history of existence of retail Government Bond Market, the retail Bond Market in India is almost non-existent today.

Despite path breaking measures already implemented by the Government, Regulators and both NSE/BSE for development of the corporate Bond Market in India, the secondary market continues to be shallow. About 95% of the NFC corporate issuances are made by few 'AAA'/'AA' rated corporate on Private Placement basis and invested by a handful of 'Buy and Hold' category of Institutional investors like Pension Fund, Provident Fund and Insurance companies. In absence of large number of companies rated 'BBB' and above including SMEs



and the vast population of retail household investors in the corporate Bond market, the depth, width and liquidity of the corporate Bond Market continue to suffer in India.

The past studies are largely concentrated on Retail investors' investment preferences in general. Time to time various literatures therefore emphasized the need for continuing further research studies for development of the retail corporate Bond Market in India. The scope of this Paper is limited to (i) Study of the Market Mechanisms of the Global referential Models of NFC Retail Bond Markets, (ii) Identification of the Market Mechanisms (independent variables) that contribute to the growth of these Global NFC Retail Corporate Bond Markets and (iii) Evaluation of the likeliness of these Market Mechanisms as identified in the Global Referential Models by the Retail Household investors in India.

## 2. REVIEW OF LITERATURE

**M. T. Raju et al (2004)** identify three factors for development of the corporate Bond viz. Development of Bond Managers, Diversity of investors and Good quality of Papers. The author views that while the second factor is exogenous and the third factor can be achieved in the long run, development of Bond Managers can be achieved in the short run.

**R H Patil (2004)** believes that an average retail investor is more comfortable to invest in Bonds when the Bank sells the Bonds over the counter. The author suggests that Banks should transform its role as Market Makers providing two-way quotes at their designated branches. The author also suggests dissemination of fair price, transparency and integrity with regulatory governance to boost the confidence of the Retail investors in Bond investments.

**Amy K Edwards (2005)** in the Bank of International Settlement (BIS) Review opines that Post-Trade Transparency through the 'Trade Reporting and Compliance Engine' (TRACE) in US is a factor for lowering transaction costs both to the Retail investors and the Institutional investors. The report also views that it is 'Trace' that enables both National Association of Securities Dealers (NASD) and Securities and Exchange Commission (SEC) to exercise surveillance for investors' interests' protection.

**Tirath Ram Basara (2011)** in their Paper on the role of Merchant Banking in Public issues view that the Merchant Bankers are concentrated in Mumbai. The author has emphasized the need for a wide Retail distribution network of Merchant Bankers to make Public issues a success.

**Josie Cox (2012)** cites the example of Germany where an entry level segment has been launched to facilitate the process of Bond investment transactions where with independent advice from a 'Listing Partner' the companies arrange their own prospectus, compliance of regulatory and transparency requirements and also on corporate finance and investor relations. The report views that such new platforms pave the way for growth in the Retail Bond Market with other exchanges in Germany shifting to such new platform for SMEs.

**Dr Kedarnath Mukherjee (2012)** views that in US the investors including retail investors are broad based and the Bond Markets in Italy and other European countries are well developed. The author points out that the participation of Retail investors in the European Bond Market vary from country to country with the highest participation in Italy followed by Germany.

**Louis Bowman (2013)** reported in 'Euromoney' that the Order Book for Retail Bonds (ORB) in the London Stock Exchange (LSE) allows the medium and large companies to attract a large pool of Retail investors who are new to Fixed income.

**Rohini Tendulkar and Gigi Hancock (2014)** in their study on ‘Corporate Bond Markets – A Global Perspective’ observe that the secondary market is going through a transformation globally with entry of new traders and calls for standardization and more use of electronic platforms. The authors also emphasize on further Research studies to focus on the potentials of this transformation in absence of any past Benchmark of the fullest secondary Market efficiency.

**Sunder Raghavan et al (2014)** suggest more measures from the Government of India to make corporate Bonds more Retail investor friendly as an alternative to the small savings schemes. The authors view that notwithstanding the multiple Reform measures by SEBI, the Retail Bond market continues to be shallow.

**Bruce Mizrach (2015)** in his Paper published in FINRA Research note observes that there are smaller trade lot sizes, larger number of Dealers and increasing electronic trading in US secondary Market.

**Larry Harris et al (2015)** discusses the suggestions included in the Financial Economists Round Table, one of which is to introduce Brokers’ electronic Trading Platform or Alternative Trading System (ATS) where the Brokers will be posting customer limit orders directly with the Buy side customers without requiring intermediation of the Brokers. The author, however, does not undermine the presence of Brokers to the extent they are required with fewer Buy side traders available at both sides of the market.

### 3. NEED/IMPORTANCE OF THE STUDY

India has set a target to become USD 5 Trillion economy within 2024-25. It need not be emphasized that to achieve this robust target, India needs to channelize Household savings to the capital market in a big way. This is possible once large number of NFC corporate issuers and large number of retail household investors participates in the corporate Bond market. With series of reduction in interest rate on Bank deposits and small savings schemes and more such reductions being foreseen, the household investors are starving of adequate return on their savings. Research studies highlight limited growth in investments in Equity and Mutual Funds by the Retail individual investors who do not consider these to be alternatives to Bank Deposits and small savings schemes. This Paper evaluates various market mechanisms in the growing NFC Retail Bond Markets globally that will attract the Retail Household investors for investment in NFC retail Bonds in India as an alternative to the traditional investment avenues.

### 4. STATEMENT OF THE PROBLEM

Government and Regulators have been implementing multiple measures recommended by various working committees from time to time for development of the Debt Market in India. Despite all these measures, the liquidity in the Secondary Bond market in India continues to be shallow. Market is being dominated by few ‘Buy and Hold’ institutional investors who are long time investors. Only handful of highly rated (AAA/AA) Corporate issuers has access to the corporate Bond market and that too on private placement basis. There is dearth of past studies on the prospects of creating Market Making Mechanisms i.e. Market Infrastructure and Market Makers dedicated for the Retail individual investors in India drawing lessons from Global referential Models of active NFC Retail Bond Markets.

### 5. RESEARCH OBJECTIVES

- (1) To study and identify the Market Making Mechanisms in the NFC Retail Bond Markets globally which have contributed to the growth in those NFC Retail Bond Markets,

- (2) To study and develop Retail investor friendly Market Making mechanisms in India.
- (3) To study and develop the regulatory framework that will support the growth of NFC Retail Bond Market as a dedicated segment of Debt Market in India.

## 6. HYPOTHESES

H<sub>01</sub>– the Market Making Mechanisms as identified in the Global Referential Models are likely to attract Retail investment in the NFC Retail Bond Market of India

H<sub>02</sub> - The Market Making Mechanisms as identified in the Global Referential Models are not likely to attract Retail investment in the NFC Retail Bond Market of India

## 7. RESEARCH METHODOLOGY

### Sampling Technique/Tools/Size

The study is based on Primary and secondary data. Primary Survey is analysed through descriptive statistics like Frequency Distribution and Percentage computation. The primary survey is based on responses from a sample size of 447 retail individual investors out of 500 investors selected on random basis from six districts of West Bengal, namely, North 24 Parganas, South 24 Parganas, East Midnapore, West Midnapore, Nadia and Kolkata. Analysis of Global NFC Retail Bond Markets is based on secondary data like Past Research Papers, Working Committee Reports, Journal Publications, various websites and other published reports/News.

## 8. RESULTS AND DISCUSSION

### 8.1 Lessons from European Bond Markets:

**Market Making Mechanisms** - To foster improvement in the efficiency in the secondary Bond Markets across Europe, three numbers electronic platforms were introduced in the European Bond Market, namely, Galaxy, BondMatch and MTS Credit, as a part of the Paris Financial Market's Cassiopeia Project. This enabled all the Bond markets across Europe, to trade in any kind of euro denominated Non-Government Bonds irrespective of their place of issues. These electronic trading platforms were promoted as an Alternative Trading Platform (ATF) in the form of 'RFQ' approach, where 60% Government Bonds and 25% corporate Bonds are electronically traded.

**8.1.1 Regulatory Initiatives** – Lack of Transparency was observed in the Financial Markets of the European Union (EU) during the 2007-08 financial crisis. Significant impact in the European Bond Market has been brought about by the Second Markets Financial Instruments Directive (MiFID II) and Regulation MiFIR. Pursuant to the commitments in G20 for improvement in transparency, MiFID II and MiFIR regulations were introduced to bring more Pre-Trade and Post-Trade transparency in transaction reporting. The scope of these modified regulations was made applicable to all the corporate Bond Markets in Europe including OTC trades which were outside the Regulated Market (RM). MiFID II went live in the European Bond Market on 3rd January 2018. MiFID I was applicable to shares in Regulated Market, while MiFID II was extended to Bonds and Structured Products in (i) Regulated Market (RM) (ii) Organized Trading Facilities (OTF) and (iii) Multilateral Trading Facilities (MTF) and Systematic Internalizer (SI) for entities trading in organized, systematic and substantial basis. As per MiFID II regulations, securities will be considered as liquid only if these are subject to Pre-Trade and Post-Trade Transparency provisions in terms of MiFID. Implementation is in a phased manner with 95% corporate Bonds outside the scope of MiFID II in the 1<sup>st</sup> year to give protection during the initial

years and to enable the Regulator to monitor the Transparency requirements phase by phase. During the 1<sup>st</sup> 2 year still December'19, 15 trades per day are required to be considered to call a security liquid and in the 4th year till December'21 end, 2 trades will be considered to call a security liquid. As regards qualifying size for definition of liquidity, during the 1<sup>st</sup> 2 years till December'19, new issuances above € 1000 Billion and thereafter above € 500 Billion will qualify as liquid.

Extensive new requirements have been introduced starting from manner of marketing the issues, transaction reporting, trade transparency, secondary market structure, best execution practices and how the investment research will be distributed and consumed. MiFID II has implemented higher sanctions for infringement of its provisions which make the Directors personally liable for infringement of its provisions.

In fact, MiFID II Regulations run into 5000 pages and to enable a simple and quick understanding, the regulations can be fragmented into 4 aspects, which are discussed below:

### **I. Market Structure**

- (i) In order to equalize MTFs with RMs, OTF has been created as a Multilateral Trading Platform
- (ii) To close gap in earlier regulations an improved Market structure has been designed
- (iii) Trading has been shifted to Regulated Platform

### **II. Investor Protection**

- (i) Marketing and Distribution of Investment Products including structured Products can be prohibited or restricted by the European Securities and Market Authority (ESMA) and European Banking Authority (EBA).
- (ii) Strengthened limitations of commissioned advice
- (iii) New requirements of Compliance monitoring of Products and protection of client Assets
- (iv) The Insurance Mediation Directives have been amended to provide new regulations for Insurance based investment products
- (v) At all times a certain level of liquidity is required to be maintained

### **III. Transparency**

- (i) The Pre-Trade and Post-Trade data must be made available on commercial basis and published to the public
- (ii) Introducing Pre and Post Trade Regulations for Non-Equity Products (Bonds and Derivatives)
- (iii) More Transparency introduced on the Price of the Investment Research

### **IV. Reporting**

- (i) More extensive details on Degree and Type of Pre and Post Trade transactions are obligatory to be reported for investors, regulators and risk managers.
- (ii) Firms to check regularly the accuracy of the Reporting Framework using a testing system

Thus, additional requirements in MiFID II over MiFID I bring more investors' protection and Transparency.

## **8.2 LESSONS FROM ITALY:**

Revolution for creation of Retail Bond Market in Europe started in Italy in 1995. Italian Households are traditionally big investors of Government Bonds since 1970. But since 2011 end, the share of Government Bonds in customers' portfolio decreased by 70%. However, investment

in corporate and Financial Bonds, shares and Funds increased from 31% in 1995 to 54% in 2013 (Banca d'Italia).

The corporate Bond Market in Europe was mainly characterized by large volume of Bond issues by a small number of companies during the period of Global Financial crisis and Debt crisis in Europe. From the year 2008 to 2012, although the amount of fund raised was higher, yet the number of issuers was low. However, in 2017, 73 Italian companies, the largest number since 2000, raised finance through corporate Bonds, driven mainly by 46 Non-Finance companies. Funds raised in Italy by corporate Bond issuances in 2017 was EUR 71 billion, of which half the amount was by the Non-Financial companies (OECD Capital Market series data set, Thompson Reuters). During the period between 2009 and 2017, the Debt securities issues by the NFCs in Italy increased by € 82 billion, while Bank Debt reduced by € 118 billion (ECB).

### **8.2.1 Market Mechanisms of Retail Bond Market of Italy:**

In Italy Banks sell fixed income securities directly to the Retail individual investors. The Electric Bond and Government Securities Market (Mercato Telematico Delle Obligazioni e dei titoli di stato) (MOT), which is the Retail Bond Market operated by Borsa Italiana provided sovereign and corporate Bonds regularly to the Domestic (DomesticMOT) and European investors (EuroMOT). In terms of turnover MOT is the largest Bond Market in Europe and its daily trading volume amounts to a billion of euro generated by strong retail investors' demand. At the end of 2014, out of 1110 listed Debt securities, 114 were Government Bonds, 457 were Bonds and 539 were Euro Bonds and Asset Backed securities.

ExtraMOT is a Multi Trading Facilities (MTF) Platform regulated by Borsa Italiana SpA for corporate Bonds issued by Italian companies and foreign companies and listed in other EU regulated Markets and unlisted Bonds issued by Italian SMEs.

### **8.2.2 Retail Investor Friendly Regulations in Italy:**

In Italy, Bonds can be sold to the retail investors without registering Prospectus when the no. of investors to whom the Bonds are sold is limited to 150 persons (excluding Professional investors) and the amount does not exceed EUR 5 million. Trading venues like RM and MTF are required to comply with the Transparency requirement as per the Italian Transparency Framework of Pre-Trade and Post-Trade requirements. Transparency rules are designed by the Trading venues themselves considering the market share of retail investors, type of instrument, microstructure and type of Market and Trading volume. Italy has a long history of electronic trading of Government Bonds and the Market Participants therefore accepted Pre-Trade and Post-Trade Transparency. Corporate Bond Trading which were earlier mostly done in OTC Market has been moved to Electronic Trading Platform with the introduction of MiFID II. This move got acceptance of the Market Participants who were not adversely impacted by Pre and Post-Transparency requirements in the Electronic Government Bond Market. Italy has a large presence of Retail investors in the NFC Corporate Bond Market who are more benefitted from the Pre-Trade and Post-Trade Transparency and who therefore welcomed the move. Debt securities listed in MOT are made through Public offer based on a Prospectus approved by CONSOB without Trust structures. The Public has access to the Real time data on the following during the continuous trading phase:

- (i) Price and Quantities with respect to 5 Best Buy and Sell orders
- (ii) Aggregate Quantities and Orders of Minimum 5 Best Prices
- (iii) Identification of Bond, Price, Time and Date of execution and Traded Quantity
- (iv) Cumulative value and Quantity



The RM and MTFs mostly report the aggregated Pre-Trade and Post-Trade Transparency information in their websites. The OTC Trades are also required to report the Post-Trade Transparency information in Italy.

The following channels are recognized for reporting Post-Trade Transparency information:

- (i) Structures of RM or MTF
- (ii) Structures of 3<sup>rd</sup> Party
- (iii) Own Channel

CONSOB publishes list of 98 eligible reporting channels where few channels report more than one subject. For OTC Trades the Post-Trade Transparency Services (PTTS) is extended by Borsa Italiana. The information is accessible also to Non-Members and information vendors. There are Nine RMs, Eight MTFs and One SI in Italy, over and above OTC transactions.

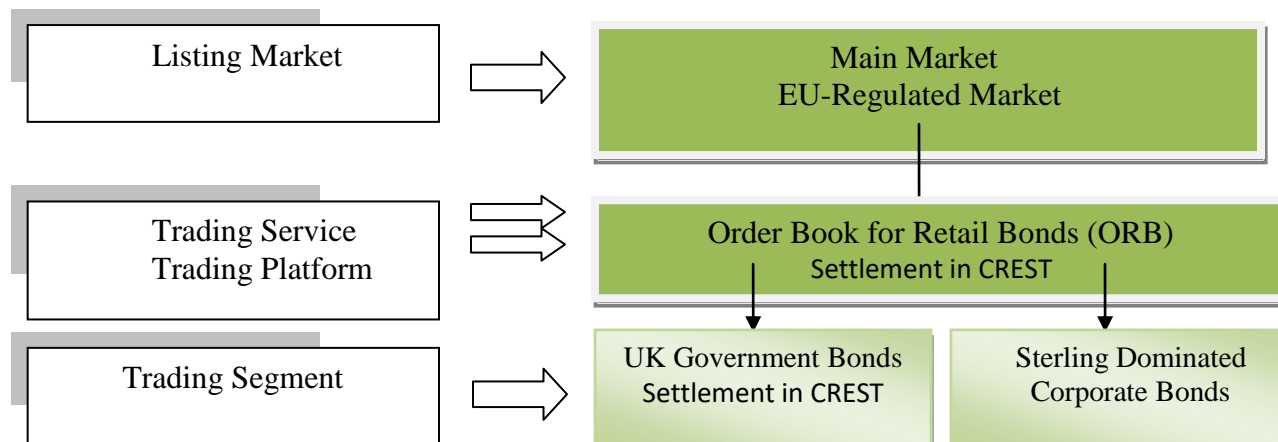
### **8.3 UK - LESSONS FROM LONDON STOCK EXCHANGE (LSE)**

Retail individual investors' demand for Retail corporate Bonds in LSE had grown five-fold since 2008. With the launch of new Electronic Retail Bond Market enabling the Private individual retail investors to on-screen liquidity and Price Discovery, the retail individual investors in LSE have now access to a cost-effective, transparent and efficient Retail online Bond trading system. With Par value of £ 1000 and below, the small size retail corporate Bonds are now available in Electronic Order Book for Retail Bonds (ORB) in LSE. According to the individual preferences and investment strategies, the individual investors of UK are now developing increasingly more appetite for investment in individual corporate Bonds in a transparent and liquid retail corporate Bond Market with the flexibility to trade in and out of individual Bonds as per their choices. ORB stimulates the corporate issuers to bring retail investor friendly new issues and distribute the same to the retail investors by providing an efficient retail investor dedicated Platform.

MOT model of Italy operated by Borsa Italiana, the most liquid and heavily traded Bond Market in Europe has been extended to LSE's Retail Bond Market for the retail individual investors of UK, using the familiar SETS Model. Dedicated Market Makers provide Buy-Sell Prices throughout the Day. Price Discovery is visible in LSE's own site or Third-Party Channels. Liquidity is ensured by the central trading system. Surveillance is exercised by the Financial Conduct Authority (FCA) on all trades. Entry to the ORB is open to all the registered Market Participants enabling the Traders to make the Price or take the Price. There are dedicated Market Makers and other registered Participants in the Retail Bond Market who in ORB enable straight through processing to Retail individual investors via traders thus making the system simple, cost-effective and efficient. Prices of Bonds are accessible to the retail investors on-screen. They can trade in retail Bonds online in the same way they trade in shares. Minimum Price movement is fixed at £ 0.01 (One Penny) for all Order Book Bonds. The fees payable by the Market Participants is also low at 90 Pence per order. Trade data is published automatically, and settlement is done through CREST. Electronically processed trade data is automatically transmitted to Post trade router which computes the accrued interest for settlement through CREST on behalf of the counterparties. The minimum lot size varies from £ 100 to £ 10000 as reflected in the Prospectus of the specific Bond for all UK retail segment Order Books against each Retail Bond. Electronic Platforms were hardly used by the Retail individual investors in UK till the Electronic ORB for Retail Bonds was launched in 2010 and prior to that the private retail investors preferred to trade over the counter and the trades were being reported thereafter. UK Regulations under Prospectus Directive define 'Wholesale Bonds' as tradable size of £ 100000 and above. Tradable size of below £ 100000, normally of £ 1000 is called 'Retail Bonds'. In the

initial phase, LSE ORB selected few Retail-friendly listed corporate Bonds in the Main market for trading in ORB and more retail Bonds were available to the retail investors in the Market with the range of corporate issuances widening over time. The structure of Retail Bond Market in UK is demonstrated in Fig.1:

Fig. 1 Structure of Retail Bond Market, UK



(Source: London Stock Exchange Group Publication)

The structure of LSE ORB is demonstrated in Fig. 2:

Fig. 2 LSE Retail Bond Order Book Segments and Sectors

Trading Services	Segment Code	Segment Description	Sector Code	Sector Name
Order Book for Retail Bonds	UKGT	UK Order Book Gilts	UKG1	UK Order Book Gilts 1
	UKCP		UKG2	UK Order Book Gilts 2
		UK Order Book Corporate and Other Bonds	UKC1	UK Order Book Corp Bonds 1
			UKC2	UK Order Book Corp Bonds 2
			UKD1	UK Order Book Corp Bonds 3
		INCP	UKC3	UK Order Book Corp Bonds 3
	International Corporate and Other Bonds		UKS1	UK Order Book Corp Bonds Dirty Priced
			INC2	UK Order Book Subnational Bonds
			INC3	ORB International & Other Corp Bonds 2
				ORB International & Other Corp Bonds 3

(Source: London Stock Exchange Group Publication)

Fig. 2 reveals that there are three Retail size segments in LSE ORB, namely, (i) Gilts (ii) Corporate and other Bonds (iii) International corporate and other Bonds. Each segment is subdivided into sector that defines the parameter and maximum spread allowable for monitoring the prices of various categories of Bonds. Order execution is undertaken either by (i) Aggressive Execution or by (ii) Passive Execution. Under Aggressive execution route, the Market

Participants can enter order and execute the same electronically at the quotes of the Market Makers. Under passive execution the participants can enter their own desired order and the Market Makers quote maximum spread and minimum volume which is multiples of the standard lot size as set for the security.

UKLA, the listing Authority process listing of Retail Bonds in two steps, namely, (i) Admission to UK official list managed by UKLA and (ii) Admission to Trading in the LSE's Main Market managed by the Admission Team.

#### **8.4 LESSONS FROM NFC RETAIL BOND MARKET IN US**

US has an 'Open Architecture' Model of NFC Retail Bond Market. In US the Retail investors execute trades in corporate Bonds through live and executable quotes. These live and executable Quotes are sent by the Dealers which enter into the Retail Trading system like Tradeweb direct, TMC Bond and ICE Bondpoint. The Dealers carry inventory of Retail Bonds and provide liquidity in the Retail NFC Bond Market. Dealers carry 'Street Inventory' of retail Bonds and provide Bid-Offer Quotes for active trading of the Retail Bonds in the Electronic exchange. The Dealers may or may not have their captive Financial Advisor Distribution network. Bid-Ask spread generate their revenue. 'Internal Inventory' refers to the liquidity provided by the trading desks of the Retail Brokerage Houses to the clients of their Financial Advisor Network. Retail Brokerage Houses provide the Quotes either to the self-directed retail investors or to the Financial Advisor Desks based on the Bid-offer Quotes that they ingest from the Retail trading system. 'Street Inventory' may also be offered from these Trade Desks and the level of street inventory displayed varies from Firm to Firm. The online Retail Brokerage Houses provide 'Open Architecture' displaying all the Bid-offer Quotes from the street inventory or they may show only the Pre-Trade offer side Quotes. The Retail Brokerage Houses allow Limit orders which are part of Depth of Book. In US there are 6 to 10 retail Bond Market dedicated traders who offer live and executable Quotes of corporate Bonds to the Retail individual investors. Pre-Trade Transparency is facilitated by 'Trade Reporting and Compliance Engine' (TRACE) data.

#### **9. FINDINGS**

Drawing lessons of the Market Infrastructures and Market Makers from LSE 'ORB' Model, US 'Open Architecture' Model and from other European NFC Retail Bond Markets based on survey of secondary data, a Questionnaire was designed for Primary survey and sent to 500 Retail individual investors in six districts of West Bengal, out of which 447 responses were received. The objectives of the Questions were to find out the degree of likeliness of the Global Models of Market Mechanisms by the NFC Retail individual investors in India.

Measurement of the responses was in terms of five-point Likert scale, namely, 'Very unlikely', 'Unlikely', 'Don't Know', 'Likely' and 'Very likely'. Questions on likeliness of the individual Retail investors on various types of Market Makers and Market Infrastructure as observed from the global Retail Bond Market Models, have been analyzed based on their Frequencies of responses under each of the above five-point scales in binary mode, with '0' indicating 'No' and '1' indicating 'Yes'. The frequencies of positive responses indicate sum of frequencies under 'Likely' and 'Very likely' scales as the data is non-parametric. The Market Mechanisms where the frequencies of positive responses are less than 50 % have not been considered in the analysis. The shortlisted Market Mechanisms where the number of Frequencies of positive responses are 50 % and above have thereafter been ranked in order of the number of Frequencies of positive responses registered in both the scales. Ranking has been done for the top five ranks separately

for two elements of Market Mechanisms, namely, (i) Types of Market Makers and (ii) Types of Market Infrastructure. The data on Market Makers is tabulated in Table 1:

**TABLE-1 RANKING OF MARKET MAKERS**

Rank	Market Makers of NFC Retail Bonds	Combined Frequencies (Likely + Very likely)	Percentage of Sample Size (447)
1	Commercial Banks	343	76.73
2	Online Financial Advisors' Network with back-up Dealers' Desk	334	74.72
3	Registered Exchange Brokers	288	64.43
4	Post Office Banks	280	62.64
5	Merchant Bankers	239	53.47

(Source – Primary Survey Data)

The Data on Market Infrastructure is tabulated in Table 2:

**TABLE 2 - RANKING OF MARKET INFRASTRUCTURE**

Rank	Market Infrastructure for NFC Retail Bonds	Combined Frequencies (Likely + Very likely)	Percentage of Sample Size
1	Easy access Retail Bonds to the Retail individual investors with Physical and Online Buy and Sell Points	340	76.06
2	Dedicated Online Platform for Primary Issues and Secondary Trading	314	70.25
3	Online Exchange Screen with Real Time Display of Transactions, Prices and Interest rates for Pre-Trade and Post-Trade Transparency	303	67.79
4	Special Purpose Vehicles (SPVs) formed by Dealers as Dedicated 'Bond Management Company' with authorization of securitization transactions, Risk Management and Market Making	301	67.34
5	Online Multiple Trading Facilities (MTFs)	293	65.55

(Source – Primary Survey Data)

Table 1 reveals that the Market Makers holding the top five ranks are between 53.47% and 76.73% frequencies with average frequencies of positive responses of 66.40% of retail investors who have preferences to these Market Makers for investment in NFC retail Bonds. Table 2 reveals that the Market infrastructures placed in the top five positions are between 65.55% to

76.06% frequencies with average frequencies of positive responses of 69.40% of retail investors who have preferences for these Market Infrastructures for investment in NFC Retail Bonds. The above findings reveal that the preferences of the Retail individual investors of India in respect of various Market Making Mechanisms are aligned significantly with those of the Global NFC Retail Bond Markets in the European countries and in the US. The findings, therefore, validate the Hypothesis  $H_{01}$  with rejection of the Hypothesis  $H_{02}$ .

## 10. RECOMMENDATIONS

- (1) During the initial phase of development of NFC Retail Bond Market, a group of Market Makers solely dedicated for this Market need to be created who are appearing as the first five choices of the Retail Household investors (Table 1)
- (2) Government and Regulators need to create debt segment solely dedicated for Retail Bond Market for Retail individual household investors with enabling Market Infrastructure as per the top five choices of the retail investors (Table 2)
- (3) US 'Open Architecture' Model is recommended for implementation in phases.
- (4) Regulations applying to Corporate Bond Market in India need to be overhauled for greater
  - (i) protection of Retail investors' interests, (ii) Pre-Trade and Post-Trade Transparency of information, (iii) Simplification of Public issues of Retail Bonds and (iv) Participation of large number of corporate issuers, drawing lessons from MiFID II and MiFIR as implemented across the European countries.

## 11. CONCLUSIONS

The successful Global Models of NFC Retail Bond Markets show the way for activating a vibrant NFC Retail Bond Market in India, which will be very costly to be overlooked considering the huge capital needed to achieve the USD 5 Trillion growth of the Indian Economy within 2024-25.

## 12. LIMITATIONS

Debt segment solely dedicated for NFC Retail Bond Market is so far non-existent in India. Debt segment as implemented by BSE/NSE deals with both Government Bonds and corporate Bonds, in general, under different category codes. The study therefore had to rely on the active global NFC Retail Bond Markets which are operating as a dedicated Retail Bond segment. Availability of Research Literatures solely focused on study of NFC Retail Bond Market posed constraint.

## 13. SCOPE FOR FURTHER RESEARCH

To take the growth of the NFC Retail Bond Market in India forward, further Research studies are necessary to find out the ways and means to ensure business viability of the Market Makers who may be dedicated for increasing the width and depth and bringing liquidity in the NFC Retail Bond Market of India.

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## **STUDY OF INFORMATION SECURITY, RISK, AUDIT AND THE ROLE OF LAW IN SRI LANKAN PERSPECTIVE**

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### **ABSTRACT**

*2010 was named as the Information Technology year in Sri Lanka. Our main attention was focused on whether our systems supported by Information Technology (IT) were safe from attacks. With the expansion of Information Technology most of the Sri Lankan organizations were driven by computerized information systems. With the vital role played by the Information Technology for its users it offers not only the benefits but also unchallengeable threats. These threats came in many forms such as data sabotage, destruction of systems and hacking offences. To address this issue both the IT professionals as well as the legal experts had come with their own solutions from time to time. The role played by the Information Technology Audit was focused through this paper. Through IT Audit the possible attacks to the systems could be identified. The role played by the legal experts in this regard was enacting the most recent Computer Crimes Act No 24 of 2007 which enable to bring security violators to the law. The research methodology adopted by this research was checking 75 information systems of Sri Lanka by a validated questionnaire. The questionnaire was presented to the system users and the feedback from them was taken as the results of this study. IT Audit also could be used as an evaluation tool in a research like this although this study limited its scope to adopt sampling method through questionnaire since the data was highly confidential. The findings were analyzed in order to come for conclusion which satisfied the implemented security level in information systems which were reviewed. Overall security of the information systems was satisfactory in terms of physical, logical and network security. Approaches that could be taken when a breach of security was there in terms of legal measures were also come under review.*

**KEYWORDS:** *Information Technology Audit, Security, Law*

## INTRODUCTION

Our systems which supported by Information Technology were called as Information Systems. IT plays a vital role in our life today. With the expansion of IT the possible attacks to the systems had taken an increase. This would destroy our IT systems, data and databases of importance. Attacks and hacking to the IT systems go hand in hand today. We must have to see how to safeguard our systems from such possible attacks. On the other hand our Information Systems could be protected from physical as well as logical attacks and from hackers.

With the introduction of our Computer Crimes Act No 24 of 2007 computer related crimes and hacking offences are primarily addressed. Computer related crimes introduce sabotage of computer system through data destruction, intrusion, alteration, deletion and other malpractices. Hacking offences mainly contribute to destroying of the system through internet such as introducing viruses, worms and also cyber hacking, phishing etc.

In related to both these offences our practice could focus on identifying such risks and fill the loopholes in IT security systems. With the increase of Information Technology development the possible attacks also had increased. This was also going simultaneously since hackers also had been finding new ways and means of attacking the existing systems.

A way to identify such risk was Information Technology Audit. This was to bring the IT security system in compliance with the standards.

Three main areas which IT Audit focused on are physical security, logical security and network security. IT Audit was used by many Sri Lankan organizations today by involving external as well as internal IT Auditors. Also it had become a mandatory requirement for the Sri Lankan companies which are regulated through Stock Exchange to be in compliance with the new Companies Act 2007.

IT Audit was also carried out with the Financial Audit annually and this is helpful to evaluate the Information systems of the company which are mostly computer systems. Possible threats as well as the identified risks and breach of security was reported in the IT Audit report and this study focused on how IT Audit was taken as a tool to evaluate Sri Lankan Information Systems.

Law and legal parlance had come into the scenario when the hackers were identified through the IT Audit. Legal measures could be taken to bring the culprits to the law. The new enactment of Computer Crimes Act gave provisions to bring such offenders to the law.

### Problem Statement

The problem of this study was to see how secure our information systems used in Sri Lanka. To address this problem IT Audit could be taken as a tool.

### Objectives of the Study

- The objective of the study was to evaluate security status in information systems currently used in Sri Lanka in relation to physical, logical and network security. The tool of evaluation was the Information Technology Audit (IT Audit).
- I. To focus on the roles of different sectors in prevention
- II. Role of awareness and education
- III. To strengthen IT Tools to enhance security

#### **IV. The role of legal measures through the Computer Crimes Act of Sri Lanka**

##### **LITERATURE REVIEW**

This study focused on the literature published by the industry experts and other relevant recent published literature.

Information security still narrowly focuses on the use of technology to mitigate threats. Experience has proven that policy, process and procedure, complemented by technology, provide more effective defence, in most cases, than technology alone. (John.P.Pironti, 2008)

Key elements of an Information Risk Management Program as stated by John.P.Pironti (2008) are Chief Information Risk Officer. Information Security, Physical Security, Compliance, Privacy, Financial Risk, Business Operations Risk etc.(p 45)

According to him physical security is “the physical security organizations provide insight into threats and vulnerabilities to the physical infrastructure elements of the organization and to personnel. This group defines, implements, monitors and matures physical controls and control frame work that used to mitigate the identified threats and vulnerabilities”. (John.P.Pironti, 2008)

##### **Physical Security**

In physical security the attention was on the area where computers are located. The computer systems were to be protected from physical intruder attacks. For this the authorized area should be named and only authorized access should be established. In other terms a key locked door should be maintained. In high security areas mainly in server room this can be improved to key pad access, finger print scanners and retina access. Always there should be an authorized access register to enter the security area and entries should be maintained properly.

An important point to remind in this situation is to have only few regular authorized persons and number of visitors should be strictly controlled and carefully watched. The area should be well sealed and all windows and ventilation pockets should be sealed. To maintain the temperature there should be properly functioning Air Conditioner and humidity meters and thermometers. At the entrance there should be an inflammable gas cylinder (CO<sub>2</sub>) which have proper expiry period in a case of fire attacks.

##### **Logical Security**

Then the attention was given our attention logical security.

Logical security mainly focused on password security. Passwords could be implemented in various levels such as in the login to the computer, password protection to files and folders and password protection to networks and administrative logins.

Password protection to computers should be highly implemented to minimize security and network risks. One user login per password should be implemented and this should be conveyed confidentially. User name and password management is also a highly vulnerable area. User guidance should be given as how to secure their logins from hackers and possible attacks. This was mainly focused on how passwords are implemented. Passwords should have a minimum number of characters and maximum number of characters. Also the age of the password and expiry should be defined. Ideally expiry should be within 30-60 days. This will prevent password hackers to operate.

Administrative login also should be carefully implemented and maintained. Authorized users

should be minimum and their logins should be carefully managed.

Level of encryption was also important in logical security. Using encrypted passwords were high security measures.

### **Other Security Measures**

In terms of network security the computers that were connected to the network should be managed securely. Outside user penetration should be barred. Firewall implementation was one aspect in this situation. The network should be secured from internal and external penetration. This could help to secure the system from virus, worms attacks and other malware.

Not only IT Audit focus on the above mentioned areas but expands its horizons to backup protection, disaster recovery and business continuity planning.

### **End Point Security**

An End Point is an individual computer system or device that acts as a network client and serves as a workstation or personal computing device. Common end points are laptops, desktops and personal computing devices. End Point security which is a key component in the information security defences of organizations is being overlooked by a significant number of organizations, according to a survey released by Secure computing Corp. in July 2006. (Martin Leo, 2008)

### **Law Plays the Role**

Next our focus was on how law and litigation plays in the above mentioned IT security risks. IT Audit would find the possible risk areas and how the Information Systems lacks protection. Also the Audit report would highlight issue and what possible prevention clauses should be taken. Not only reporting issues IT Audit could highlight the software licensing problems and the road to identify the intruders. Then the law automatically had come into the scenario. Filing action against the intruders in a court of law was the responsibility of the management of the organization. Litigation would start accordingly and to punish the offenders and demand compensation was based on our new Act, Computer Crimes Act 2007. This clearly identified sections on how to bring offenders to the law and to punish them accordingly with imprisonment and or with fines.

Part II of the Computer Crimes Act No 24 of 2007 stated the investigation procedure in a security breach of an organization.

Section 17 of the Act defined that appointment of a panel of experts for investigations. Section 18 stated the powers of search of seizure with warrant in such an investigation. Section 19 of the Act defined the preservation of information in the investigation procedure.

The Computer Crimes Act stated that the prosecution to be carried out according to the provisions in the Code of Criminal Procedure when it was not specially mentioned.

According to the Section 17(3) of the Computer Crimes Act 2007 when carrying out the investigation an expertise of the field should be involved. Ideally expertise from Electronic Engineering or Software Technology was to be involved in the investigations.

There are provisions where police officers also could be involved in the investigation procedure and they are called as peace officers in such situations.

CISA Review Manual (2007) stated that legal repercussions can be there due to the computer



crime issues and exposures.

It further stated that there are numerous privacy and human rights laws an organization should consider when developing security policies and procedures. These laws can protect the organization but also can protect the perpetrator from prosecution.

In addition not having proper security measures could expose the organizations to lawsuits from investors and insurers if a significant loss occurs from a security violation. The IS Auditor should obtain legal assistance when reviewing the legal issues associated with computer security.(CISA Review Manual, 2007)

## METHODOLOGY

Methodology followed in this research was mainly the literature research and a pilot case research. For this particular study pilot case study was involved where the data were collected through a questionnaire which involved a representative sample.

The pilot research was for 75 Information Systems in Sri Lanka. The sample was taken by selection of 75 Colombo Security Exchange (CSE) listed IT audited companies, applying convenience sample method. These organizations belonged to both government and private sectors. A questionnaire was developed to identify possible information security threats in terms of physical, logical and network security measures. Author's experience as being an IT Auditor and a Technology Audit Lead was helpful in developing the questionnaire, deciding the sample and carrying out the research. The designed questionnaire was taken as a tool to collect respective data from system users.

Observation method was also carried out in this research to validate results. Mainly the physical security implementation level was carried out by the observation method which validated the results gained through the questionnaire.

### Sample

Sample was of 75 IT systems in Sri Lanka mainly focusing on their implementation level of physical, logical and network security. Sample was selected from the Colombo Stock Exchange (CSE) listed IT Audited organizations. Sample was in the range of governmental, private, banking, plantation and other key organizations whose major system was information systems. Convenience sampling method was used and primary data was taken through a questionnaire.

## FINDINGS OF THE STUDY

Following findings could be seen when the data was analysed. Table 1 depicts the findings of the research conducted.

**TABLE 1: IMPLEMENTED LEVEL OF IT SECURITY OF THE REPRESENTATIVE SAMPLE**

Security Level	Positive Organizations	Negative Organizations	As a Percentage P= Positive N=Negative
Physical Security	69	6	P=92%, N=8%
Logical Security	70	5	P=93.33%,N=6.66%
Network Security	54	21	P=72%,N=28%

69 organizations out of 75 had implemented physical security measures. This was as a

percentage 92%. This showed a positive result in physical security implementation. Only 6 out of 75 organizations had not implemented any level of physical security. As a percentage it was only 8% of the representative sample.

70 organizations out of 75 selected organizations had implemented logical security measures. This was as a percentage 93.33%. This showed a positive result in logical security implementation. Only 5 out of 75 organizations had not implemented any level of logical security and gave a negative result of 6.66% for the logical security implementation.

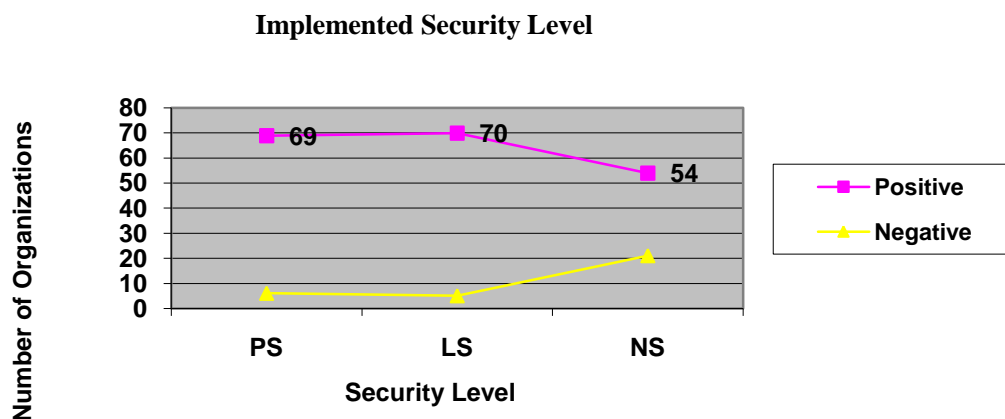
When compared to physical and logical security implementation level a low percentage was seen for the network security implementation. 54 organizations out of 75 selected organizations had implemented network security measures. This was as a percentage 72%. However this percentage also showed a positive result in network security implementation. 21 out of 75 organizations had not implemented any level network security and gave a negative result for the network security implementation. As a percentage it was 28% of the representative sample.

Analyzed data was depicted in a graph as follows.

PS = Physical Security

LS= Logical Security

NS= Network Security



**Graph 1 Implemented Security Level of Organizations as a Number**

## DISCUSSION

This study focused on all three areas of security information systems must have been implemented namely physical security, logical security and network security. The research resulted the Sri Lankan information systems surveyed had been having a high security in respect of physical, logical and network security.

Information Technology Audit (IT Audit) evaluation was limited to a designed questionnaire and feedback from system users, since the author was not in an authorized capacity when doing this research to do a complete IT Audit.

The systems surveyed had 92% of physical security implemented. This was in the range of basic security for example having key lock systems to very high physical security implementation such as swipe cards and finger scans. However it was seen in Sri Lanka still had not gone to the extent

of retina scans in terms of physical security.

This study had a limitation where the author had to rely on the questionnaire method and as a result to take the feedback and the information given by the information/system user. The results might slightly change if the author could do an Information Technology Audit which at this situation the author who had experience as an IT Audit Lead, did not have the authoritative capacity. Therefore the experience gained by the author was taken into when designing the questionnaire and taking the information from the users.

Also observation method was helpful when checking the physical security measures. Therefore the data given by information users for the physical security was 100% reliable and the author could validate the answers in this security area with high confidence.

Then the study focused on logical security in which 93.33% of the selected organizations had implemented logical security. As in physical security implementation level, the logical security implementation also was in the range of basic to medium and to high level implementation such as encryption.

Very few information systems had encrypted standards and user awareness on encryption. However most of the systems had password policies and password implementation. Also systems were secure in terms of authorized logins and locking the system when the user was not available.

Network security implementation result showed 72% had taken security measure in relation to network security. This was basically implementing firewalls and banning insecure websites from the corporate internet.

It could be seen from this study the information systems used in the research had overall high security measures implemented. Breach of such security measures could only be identified through conducting a proper Information technology Audit which was not in the scope of this study.

The legal measure and the role of law through the Computer Crimes Act No 24 of 2007 could be taken if such breach was uncovered and reported respectively. Then part II of the Act could take specific action in relation to investigations and the experts to be named in such an investigation procedure.

If a proper IT Audit could be conducted the clear insight to the logical and network security implementation level could be revealed. However even if in carried out IT Audit, the report which disclosed the findings were not available to all but only to the higher management like Board of Directors of the organization. Since the IT Audit report was highly confidential disclosing breach of security in the organization and accessing legal measures was at the discretion of the higher management. Therefore the role played by law could be also limited in such a situation and access to the law was at the hands of the organization higher management.

Awareness through user education is a very good method which could be adopted within organizational level. Through this users could be educated of such security breaches and can prevent future attacks. Also user awareness of new security measures and standards like BS 7799 could be provided to the system users to be precautious and to strengthen their security implementation.

Complex Information Technology tools could be used to enhance and strengthen the security of

the system to overcome security breaches in future. Also legal measure such as mandatory laws could be passed to organizations to be in compliance with IT security to adopt security standards.

Sri Lankan organizations had adopted one such mandatory measure was implementing IT Audit to be in compliance with Companies Act No 07 of 2007.

The objective of the study evaluating Sri Lankan information systems in terms of their security implementation standard was achieved in this research.

Also exploring the measure of law in a case of breach of such security was also achieved by taking the options the role of law could play such as bringing the offenders to the law under the existing law. Achieving the objectives of awareness through education and also strengthening the IT systems was also achieved.

## RECOMMENDATIONS

Recommendations to the organizations which are having computerized information systems through this study are to implement high security levels in terms of physical, logical and network security. Also to have internal controls such as secured levels of administration and adhere to the best practice standards like BS7799 and ISO standards.

Exploring the new techniques in Information Technology tools such as high programming levels to enhance security of the Information System and passing new laws to be in compliance with IT security are valid recommendations to Sri Lankan organizations.

It is said prevention is better than cure. Therefore by implementing a high security level as recommend by IT Audit is much more beneficial to the information systems holders than searching for culprits when the security is breached and the damage is done.

## CONCLUSION

I would like to highlight through this paper the importance of identifying IT security risks, the role of IT Audit and finally how the law would help to protect IT security systems. In the conclusion I want to stress the fact that legislation and litigation is not the final answer, which should be in the hands of ICT professionals who should find new security measures in addition to the existing ones to override the hackers and computer attackers' new endeavours, methodologies and loopholes.

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## **TECHNIQUE OF IMPROVING THE TECHNICAL AND TACTICAL SKILLS OF NATIONAL WRESTLERS**

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### **ABSTRACT**

*The article focuses on movement training and physical development. The methods of improving the technical and tactical skills of national wrestlers are shown. Work on improving technical and tactical skills is based on scientific evidence. The person who conducts the pedagogical process in the field of physical education should see it not only in terms of education and training, but in accordance with the principles of physical development. It is important to remember that the principles of exercise training reflect the same requirements: any pedagogical process must be based on consciousness, activity and other principles. Excessive demands on the physical abilities of the organs and systems in the body, excessive physical activity (accelerated exercise) can have the opposite effect and can be detrimental to health. It is important to keep in mind that the effects of loading are not the same as the morphological improvement rates of different organs, systems and functions in the body. In practice, there are many variants of selective uploading options. For example, to improve aerobic performance of a cross-country skier during a single exercise, you can only fund motoring. However, this exercise must be performed in different modes: first using a spaced and then one standard method, or rather using a set of one-way tools for one-on-one training. Thus, only the actual values of maximum load can be determined by the physical condition of a person. Of course, the maximum load on the development of physical abilities should be used in accordance with other principles, which should take into account the age, specificity, and specificity of the downloads, when appropriate training is given to the individual.*

**KEYWORDS:** *Technical and tactical skills, physical ability, legality, training, pedagogical practices, wrestlers.*



## INTRODUCTION

The processes of training and development of physical abilities are subject to different laws, even though they are the only object of influence - an individual performing physical activity. The originality of the laws requires appropriate pedagogical (methodological) actions for their implementation: for teaching behavior - the same pedagogical principles, for the development of physical abilities. By the way, mastering the activity is a special feature of the pedagogical process. The person who conducts the pedagogical process in the field of physical education should see it not only in terms of education and training, but in accordance with the principles of physical development. It is important to remember that the principles of exercise training reflect the same requirements: any pedagogical process must be based on consciousness, activity and other principles. The clear implementation of the principles (ie, the choice of tools and methods) must be consistent with the tasks (the objectives of instruction or the development of physical abilities). For example, the evolution of movement training involves the use of a system of exercises, and the development of physical abilities through a system of physical loading. Therefore, any way to develop physical abilities should mean that the didactic principles are unique. As the behavioral training is influenced by the physical load on the learner, there is a need for the organism to consider the patterns of response to the expected load. Therefore, there are some specific principles that characterize the relationship between the human condition and the way that physical loads are organized in time.

### Main part

The principle of regularity of pedagogical effect. This principle implies the need for regular exercise to develop one's physical abilities. This is because abilities develop and improve in the course of their activities. The principles underlying this principle are the effect of repetition of actions and activities on the human body, how different cycles of work and leisure are reflected in each stage of recovery, and when long periods of unreasonable interruptions in training occur. Describes the recurrence of skills development. The independence of the effects on the development of physical abilities is ensured through the proper execution of a particular course within a particular course, as well as the proper rotation of classes and rest periods within a specific time period (week, month, quarter, year, etc.). . Consequently, the implementation of the principle of regularity should ensure the continuity of functional and structural adaptation processes that form the basis for the development of physical abilities. This will be achieved, first and foremost, by maintaining a mode of action that is considered to be the most desirable for each skill, and the basis for this is the order of work and rest. Gradually increasing the load, both in a single session and in a series of sessions, facilitates the alignment of the human body, deepens and strengthens the adaptation processes, thus creating new, higher loads. It will help to create conditions for the transition to the next level. Excessive demands on the physical abilities of the organs and systems in the body, excessive physical activity (accelerated exercise) can have the opposite effect and can be detrimental to health. It is important to keep in mind that the effects of loading are not the same as the morphological improvement rates of different organs, systems and functions in the body. This means that the use of different exercises during the workout requires a specific increase in the load in each case. For example, significant progress in spindle training can be achieved during the 3-month training period, with only a few muscle groups of the apparatus requiring a significant increase in volume at least 6 months. In order to improve the functioning of the respiratory system, it is necessary to exercise regularly for 10 to

12 months, and these differences can be summarized simply: flexibility increases day by day; strength - week; speed - month; year by year.

The evolution of load increases does not exclude the application of maximum (maximum) loads. Such downloads can, under certain circumstances, cause very high positive changes in physical development. Boundary loading is a load that fully mobilizes functional resources of the human body, but does not go beyond its adaptability. It does not interfere with the normal functioning of the body and does not cause it to become overweight. The notion of “boundary” loadings has a relative meaning: at one level, the threshold load is not considered as another. Thus, as the functionality of the body increases during the regular exercise, the maximum load previously becomes normal. Thus, only the actual values of maximum load can be determined by the physical condition of a person. Of course, the maximum load on the development of physical abilities should be used in accordance with other principles, which should take into account the age, specificity, and specificity of the downloads, when appropriate training is given to the individual.

### **Analyses**

The size of the physical load is characterized by its size and intensity. Accordingly, the load is done either by increasing the workload or by increasing the performance or by changing both indicators at the same time. In practice, various forms of gradual increase of load are used: straight-line, ascending, staggered, wavy and jump-loaded. More selective and complex in the development of physical abilities. - Available for large, medium and small downloads. The aforementioned downloads consistently and consistently (at the same time) improve individual abilities, such as agility, and the latter, speed and endurance during various activities. It has been proven that the use of the same route loadings for developing a particular ability during a particular exercise or series of exercises has a much deeper but limited effect on the human body than complex loads. In practice, there are many variants of selective uploading options. For example, to improve aerobic performance of a cross-country skier during a single exercise, you can only fund motoring. However, this exercise must be performed in different modes: first using a spaced and then one standard method, or rather using a set of one-way tools for one-on-one training. Complex loading has a broad, but superficial effect on the body. When applying complex capacity-based downloads, the following should be considered:

It is well-known that fast-loading loads create favorable physiological conditions for loads that require greater endurance. They will leave a trace that can negatively affect the performance of the exercises for a few hours (if there is a significant increase). It has also been found that the load loads are well aligned with the effects of force characteristics, whereas the positive longitudinal effects are in certain conditions, such as when the force is exerted before the exercise, but in reverse order. It is important to note that the following basic concepts and terms used in the struggle do not have a single description of these scientific and methodological literature and practice. Written by prof. F.A. In their work, Kerimov grounded these concepts and terms. Wrestling training system is a set of interconnected elements that make up a whole unit, aiming at training athletes who can meet the model's strengths and show the best results. is a complex of activities. Trainer training is an integral part of the training system, a pedagogically organized process to manage athlete development using structured tools and techniques to achieve high athletic performance. Training is a team of trainers and wrestlers who successfully achieve their training goals. Sports competitions are a component of the training system of wrestlers. They serve as benchmarks for training purposes and their effectiveness, and, on the

other hand, are effective tools for preparing special competitions. Athletes' technical training is a pedagogical process that provides a high level of confidence in the athlete's ability to compete. The psychological training of a wrestler is a pedagogical process, which is based on the peculiarities of the spiritual, will and sports struggle, as well as the development of spiritual qualities, which can provide a high level of reliability in the competition. Theoretical training of the wrestler is to equip the athlete with special knowledge that will train him and improve the efficiency of the tournament. Integrated training of the wrestler is a pedagogical process that integrates technical, tactical, psychological, theoretical and physical training effects to ensure effective competition. Training load is a component of the training that reflects the number of times the athlete is impacted by the training.

## **CONCLUSION**

Competitive load is the number of times and volume of competition activity. In conclusion, it should be noted that determining the role and effect of technical efforts and physical qualities of wrestlers to improve their athletic skills is aimed at improving their ability to evaluate and re-evaluate their performance in extreme contests.

1. Determine the role and effect of technical skills and physical qualities of the competitors in their sporting skills; be able to move from concrete and purposeful movements to new actions and to create new actions to perform their tasks.
2. Acquisition of the system of action, and secondly, the ability to quickly adjust the movement in changing conditions, to change the direction of movement from one direction to another. The first level is characterized by clear and coordinated movements in space. It is characterized by precise spatial behavior during time constraints. High-speed agility is defined by the precise and fast performance of the action in changing conditions. The ability to target as fast and as accurately as possible in times of time.

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## **THE USE OF PLAY AS AN EDUCATIONAL TOOL IN THE LEARNING PROCESS**

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### **ABSTRACT**

*This paper makes analyses of the use of the play in an educational learning. On this case, research has been connected with the learning process of the education. To get better knowledge and point at different analytical investigations were concluded by author. Major feedbacks as a shortcomings and outcomes were stated in the results of the final points. As we know, children's lives are full of activities and games are the main type of activities. The realities around the game are more interesting, because it is clear to the child that the child-created reality is revived. Most importantly, the educator achieves certain successes. A child's perception of the subject becomes easier and his boredom is prevented. And, of course, intellectual consistency grows and develops in children's play and study. Though opinion is very simple in person, it is because of problems. In particular, modern psychologists say that through psychology of the game, they analyze the individual at the level of an axiom, which does not require evidence that, apart from both mental and physical, and psychological, it is the basis for expanding his or her knowledge, skills and abilities. The game is a complex movement to activities that consists of different historical, social, and philosophical concepts. The game is one of the specific forms of human activity. The concept of "game" includes educational activities and activities, ranging from a simple act of rattling a child. It is also a conscious activity aimed at achieving the goal of the game. The maturity of a teacher depends on their pedagogical skills. It is important for today's educator to look for himself, to discover new ways for each lesson, to work hard for the future of his or her future, to feel the future.*

**KEYWORDS:** Use, Play, Educational, Tools, Learning Process, Uzbekistan.

## INTRODUCTION

Intellectual intelligence in the person can only awaken, develop and, of course, shape the person's personality in a well-organized educational process. The principle of continuity and continuity of our country in the system of preschool education requires consistent development of mental abilities of students.

The maturity of a teacher depends on their pedagogical skills. It is important for today's educator to look for himself, to discover new ways for each lesson, to work hard for the future of his or her future, to feel the future.

As science and technology improves, it becomes more and more difficult to ensure that a child's activity in the classroom is more challenging. Therefore, teaching children through a variety of exhibitions and games helps them to grow their speech and expand their thinking. It will be much easier for children to have fun, to understand and classify topics.

Most importantly, the educator achieves certain successes. A child's perception of the subject becomes easier and his boredom is prevented. And, of course, intellectual consistency grows and develops in children's play and study. Though opinion is very simple in person, it is because of problems. One of the main requirements of modern pedagogical technology is to develop children's independent thinking skills and interests through games that can turn children into an active listener, with different meaning in each lesson.

### Main part

As the child develops, the conditioned reflexes in it are formed as a system of first and second signals that are continuously organized by the organism during interaction with the environment and the decisive influence of parenting. The process of personality formation and development is also the process of acquiring a person's social experience.

Discipline is focused on a specific purpose, which is important for the development of the child. The decisive situation in acquiring experience in the community depends on the child's own activity and the interaction with the external environment. Therefore, the game is a free expression of the impression in the impedimentary state. As we know, children's lives are full of activities and games are the main type of activities. The realities around the game are more interesting, because it is clear to the child that the child-created reality is revived.

Children's play activities merge from early childhood and go from simple imitation to complex role play; this game originally reflects people's activities related to their subjects, norms and rules of social behavior.

Gaming is a key factor in nurturing a successful learning process. That is why it is seen as an important tool for educational and educational opportunities in the development of key issues in educational institutions. But the game evolves, as every child does, within their own legal framework, and this play is seen as a necessary requirement for a growing organism that nurtures the child's organizational skills. But the game is always a game. There are also games in which the child develops free thinking, independence, justice and friendship.

The game is a complex movement to activities that consists of different historical, social, and philosophical concepts. The game is one of the specific forms of human activity. The concept of "game" includes educational activities and activities, ranging from a simple act of rattling a child. It is also a conscious activity aimed at achieving the goal of the game. The game does not



produce any tangible material, the purpose of which is the over all image power in the up bringing and maturity of the person. In particular, the game has always attracted the attention of educators, psychologists, philosophers, medical workers, art critics and other professionals. In this regard, who is he? What is it? ” (Vol. III, Volume III, vol. Useab. 1988. p. 256) “ No matter who you are when you grow up, whether you are a doctor or a chauffeur, an operator or a designer, a teacher or a pilot-pilot, of course you feel the need for fun games ”.

In Encyclopedic Dictionary (1990) “Play is a type of activity, not a motivation, but a process. In the history of human society, the game is intertwined with witch craft, religious ritual, and more: sports, military and other exercises, art (especially its forms of execution). The up bringing and education of children play an important role in the development of children as a means of preparing them for the future. (Encyclopedic Dictionary. Volume II. Volume II. T. Usebr. 1990. p. 466).

In addition, the game evolves as an element of culture with all cultures in the community, a useful tool for raising children and adolescents. It is always focused on a specific purpose and represents a variety of guidelines and activities on a variety of topics. Play activities have a lot in common with childhood and hardwork.

The game is a very emotional activity and therefore requires serious attention in the education of children and youth. As the child grows and develops, the meaning of the game changes, while the activity of the game is simple in the early stages, it is gradually enriched and improved.

As a part of existence, a person will be able to think clearly about what he has seen and heard, be able to read, think, think, think, and produce new ideas. A skill educated or can make good use of game technologies and contribute to the correct formation of his or her knowledge, skills and abilities.

Many experts have suggested that the psychological mechanism of gaming activities is based on fundamental needs, such as self-expression, self-determination, self-control, and self-reliance.

In particular, DU Uznadze: in his description of the game, he promotes this idea, that is, "game is a form of affective mental behavior that is characteristic of the individual".

And AN Leontev describes the play as a product of the imagination, in which the individual imagined but difficult to realize, the emergence of fantasy as a reality. LS Vgodsky - "The play is a means of learning the inner world of the child, social order." In particular, modern psychologists say that through psychology of the game, they analyze the individual at the level of an axiom, which does not require evidence that, apart from both mental and physical, and psychological, it is the basis for expanding his or her knowledge, skills and abilities.

Gaming technologies perform a range of tasks such as charming, communicative, fulfilling their potential, healing, diagnosis, interethnic communication and socialization.

## Results

As game and game technology create a form of struggle, competition and competition, it will stimulate the child's interest and create a space for free creativity.

The game will be focused on different purposes. They are reflected in the development and socialization of didactic, educational activities.



1. Didactic goal is to expand the child's knowledge and cognitive functioning, to develop educational skills and skills, and to develop skills in labor activity;
2. The educational purpose is to foster co-operation, collectivism, communication, socialization, the formation of independence, the will, the formation of attitudes, spiritual aesthetics and worldview.
3. Developmental goal is to develop attention, memory, speech, thinking, hypothesis, imagination, creative ability, reflection, and motivation of educational activities.
4. The social purpose is to involve society in the norms and values, to adapt to working conditions, to control their passions, to teach self-management to communication.
5. Physical Purpose is to develop the person as a person and to ensure that the society is healthy and spiritually mature.

Also, game technologies will be implemented in the following areas:

- is based on the activation of child activities;
- Contest elements are included in the educational activities;
- educational activities are subject to the rules of the game;
- the learning material is used as a play tool;
- Didactic purpose is set as a game transfer;
- Performing didactic tasks is linked to the outcome of the game.

## CONCLUSIONS

If such games are properly organized in preschools, the effectiveness of teaching and learning will be enhanced, children will be able to expand their thinking and become more interested in science. In summary:

- Game - learning as an independent learning involves learning lessons, sections, themes and concepts;
- Used as elements of general technology;
- The game is organized as part of a workout or part of it;

Gaming technology is also widely used in extracurricular activities.

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**DEVELOPMENT AND IMPEMENTATION OF THE  
PSYCHOPHYSIOLOGICAL WELL-BEING ASSESSMENT TOOL BASED  
ON ROY'S ADAPTATION MODEL FOR BREAST CANCER PATIENTS:  
A PILOT STUDY**

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**ABSTRACT**

*Breast cancer is a chronic illness affecting a vast number of females globally. During the illness and after mastectomy they have disturbed physiological and psychological wellbeing. No tool based on RAM (Roy's Adaptation Model) was there to assess their physiological and psychological wellbeing. The purpose of the present study was to develop the valid and reliable Psycho physiological Well-being Assessment Tool (PWAT) based on Roy's Adaptation Model and implement the tool on post mastectomy breast cancer patients who were under radiation therapy or chemotherapy or both to assess their Psycho physiological Well-being. Methodology: A Methodological research design was adopted to conduct the study. Item analysis and Modified Delphi survey were done to develop PWAT. It was implemented on 20 post mastectomy breast cancer patients who were selected by convenient sampling technique in Amer Hospital Patiala. Results: Common consensus of experts was obtained from 72 pooled items to 38 items of PWAT. The reliability of instrument was estimated by using split half Chronbachs alpha which was  $r=0.73$ . Statistically all the items of PWAT were found inter correlated and were compatible to each other. The mean value of physiological wellbeing was 60.45 with stand red deviation of 6.637 and median value 61.5as compared to Psychological wellbeing mean value 80.60 with standard deviation 15.689 and median value 80.5 which revealed that post mastectomy breast*

*cancer patients were having better psychological wellbeing rather than physiological wellbeing*  
**Conclusion:** *The empowered nurses with PWAT will do quick assessment of psycho physiological wellbeing of post mastectomy breast cancer patients. Their timely intervention will help in decreasing re-hospitalizations of patients and help in cost containment for the health care industry which is the essence of quality care management.*

**KEYWORDS:** *Breast Cancer, Psycho Physiological Wellbeing, Roy's Adaptation Model, Psycho Physiological Wellbeing Assessment Tool, Quality Care.*

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## INTRODUCTION

Theory-based nursing practice is based on the concept that the work of any discipline is directed by its knowledge base. A nurse practitioner using process of theory-based nursing practice develops a practice proposition and a plan for schematic application of this nursing process in the relevant area of nursing.<sup>1</sup> Theories can interrelate the facts in such a way as to present a new view of looking at a particular phenomenon. RAM (Roy's Adaptation Model) is a highly developed and widely used conceptual description of nursing which is commonly used in different countries to guide studies that address adaptation.<sup>2</sup>

As Breast cancer in women is a major health burden both in developed and developing countries that instills feeling of dread and fear in many women. Understanding Roy's theory is extremely significant for nurses because it helps them to promote a client's adjustment to challenges related to health and illness and enhances adaptation for individuals and groups in the four adaptive modes, thus contributing to health.<sup>1</sup>

## NEED OF THE STUDY

Since the incidence and prevalence of breast cancer is rising throughout the world, younger women are getting affected. By the time cancer patients visit a specialist, 80% are already in stage 3 or 4, wherein survival rates are not very optimistic.”<sup>3</sup>

Data reports from a study on Breast cancer in 2017 stated that Breast cancer has ranked number one cancer among Indian females with age adjusted rate as high as 25.8 per 100,000 women and mortality 12.7 per 100,000 women.<sup>4</sup>

When a woman suffers from this dreadful disease and undergo mastectomy she will definitely have her physiological and psychological disturbed wellbeing due to the loss of her breast. She will always compare her present image with previous image of attractiveness. She will have low self esteem, hopelessness, depression and anxiety. The impact of physical disability on psychological health is an important issue. At that time it is very essential for a nurse to have the knowledge of the concepts of RAM to address adaptation as well as she must know that what she can do for her disturbed physiological and psychological well-being.

**Frank, C.A., Schroeter, K., Shaw,C. (2017)** conducted a descriptive survey by developing and implementing the Primary Care-Posttraumatic Stress Disorder (PC-PTSD) screening tool based on Roy'sAdaptation Model The results revealed use of the PC-PTSD tool triggered 28% of the patients to receive a health psychology consult. Forty-five percent of patients who received a health psychology consult were recommended outpatient therapy.<sup>5</sup> Another study conducted by Ramini, S., Brown, R., & Buckner, R. (2008) in a children's hematology/oncology clinic to examine adaptive strategies of adolescents with cancer by use of Roy Adaptation Model.

Respondents reported creatively managing bodily changes, keeping positive attitudes, and demonstrating psychosocial maturation.<sup>6</sup>

## **OBJECTIVES**

To develop the Psycho physiological Wellbeing Assessment Tool (PWAT).

To assess the psycho physiological wellbeing of post mastectomy breast cancer patients who are under radiation therapy or chemotherapy or both by using PWAT.

To assess the physiological Wellbeing of post mastectomy breast cancer patients who are under radiation therapy or chemotherapy or both by using PWAT.

To assess the Psychological Wellbeing of post mastectomy breast cancer patients who are under radiation therapy or chemotherapy or both by using PWAT.

To compare the physiological Wellbeing and Psychological wellbeing of post mastectomy breast cancer patients by using PWAT.

## **MATERIAL AND METHODS:**

**Research design:** Methodological- study design

**Research Setting:** Amer hospital, Patiala , Punjab.

**Population:** - The population of the study was patients suffering from breast cancer.

**Sample and Sample size:** Sample was 20 post mastectomy breast cancer patients who were under radiation therapy or chemotherapy or both.

**Sampling technique:** Subjects were selected by Non- probability convenient and purposive sampling technique.

### **Inclusion criteria**

Breast Cancer patients who were:-

- Falling in age of 30 -65 years.
- in any stage of breast cancer
- Getting treatment of radiation therapy, chemotherapy or both.
- Operated for breast cancer i.e mastectomy.
- Available at the time of study.

### **Exclusion criteria**

Breast cancer patients who were:-

- unmarried
- Not willing to participate.
- Suffering from other than breast cancer.
- Having problems in breast not due to cancer.
- Males having the breast cancer.

## METHOD OF DATA COLLECTION:

Data was collected from breast cancer patients through paper pencil method or structured interview.

## RESULTS

### 1. Development of the “Psychophysiological Wellbeing Assessment Tool” (PWAT).

Fig1

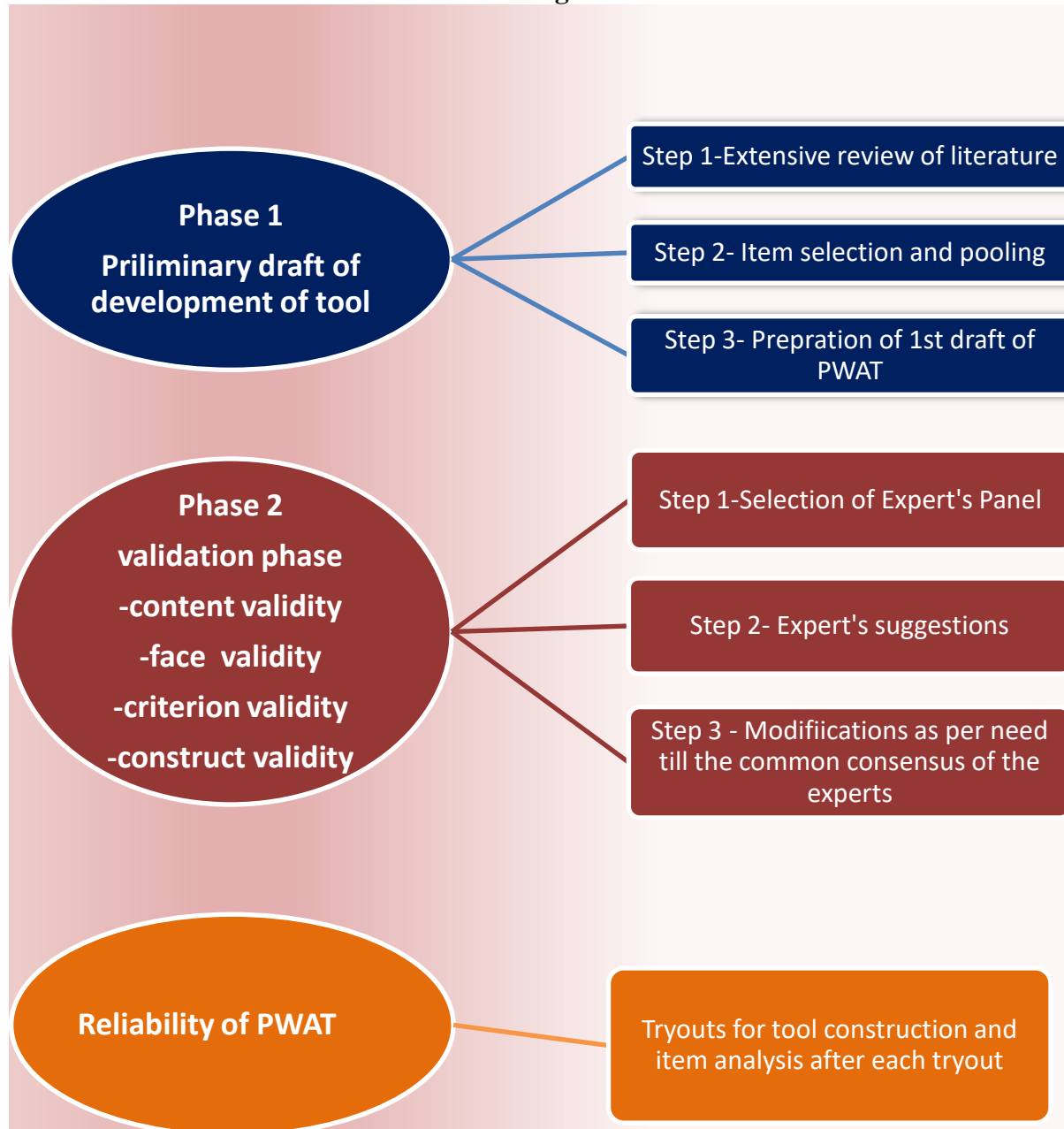


FIG. 1 PHASES OF RESEARCH TOOL DEVELOPMENT

Critical review of literature was done to develop the PWAT for post mastectomy breast cancer patients. Preliminary PWAT -1 was prepared with 72 items. It was based on two modes of RAM

(physiological mode and psychological mode) to get the detailed information about the psychophysiological well-being of breast cancer patients.

## PHASE 2 VALIDATION PHASE

First try out was done of PWAT- I on 10 breast cancer post mastectomy patients in Radiotherapy Department, Amer Hospital, Patiala to check the difficulty index of items and reliability of PWAT-I. Item analysis was done to assess the quality of the individual items and PWAT-I as a whole. Reliability statistics showed  $r=.941$ . The 5 items were expressed incompatible having mean value 2.5 or less than 2.5 (The optimal mean value for item statistics should be more than 2.5) had been excluded from the PWAT. PWAT-1 was prepared with 67 items.

Panel was selected comprising of 10 experts of different specialties of Nursing. The first draft of tool was circulated among 10 experts via e-mails or by post. The Modified Delphi Technique was adopted to validate the 1<sup>st</sup> draft of PWAT. All the panelists were requested to give their valuable suggestions pertaining to the content, accuracy of information, the item order i.e. organization and sequence of the items. The suggestions given by panelists were incorporated; changes were also made in the sequence of items as advised by the experts. Many items were modified, clubbed and deleted. New items were added to generate the second draft of the tool. After first Delphi survey, PWAT-II was prepared. There were total 52 items which were categorized under 2 subheadings: Physiological well-being (item no. 1-20) and Psychological wellbeing (item no. 21-52).

Same process of item analysis and Expert's opinion were repeated in 2<sup>nd</sup> try out and 3<sup>rd</sup> tryout.

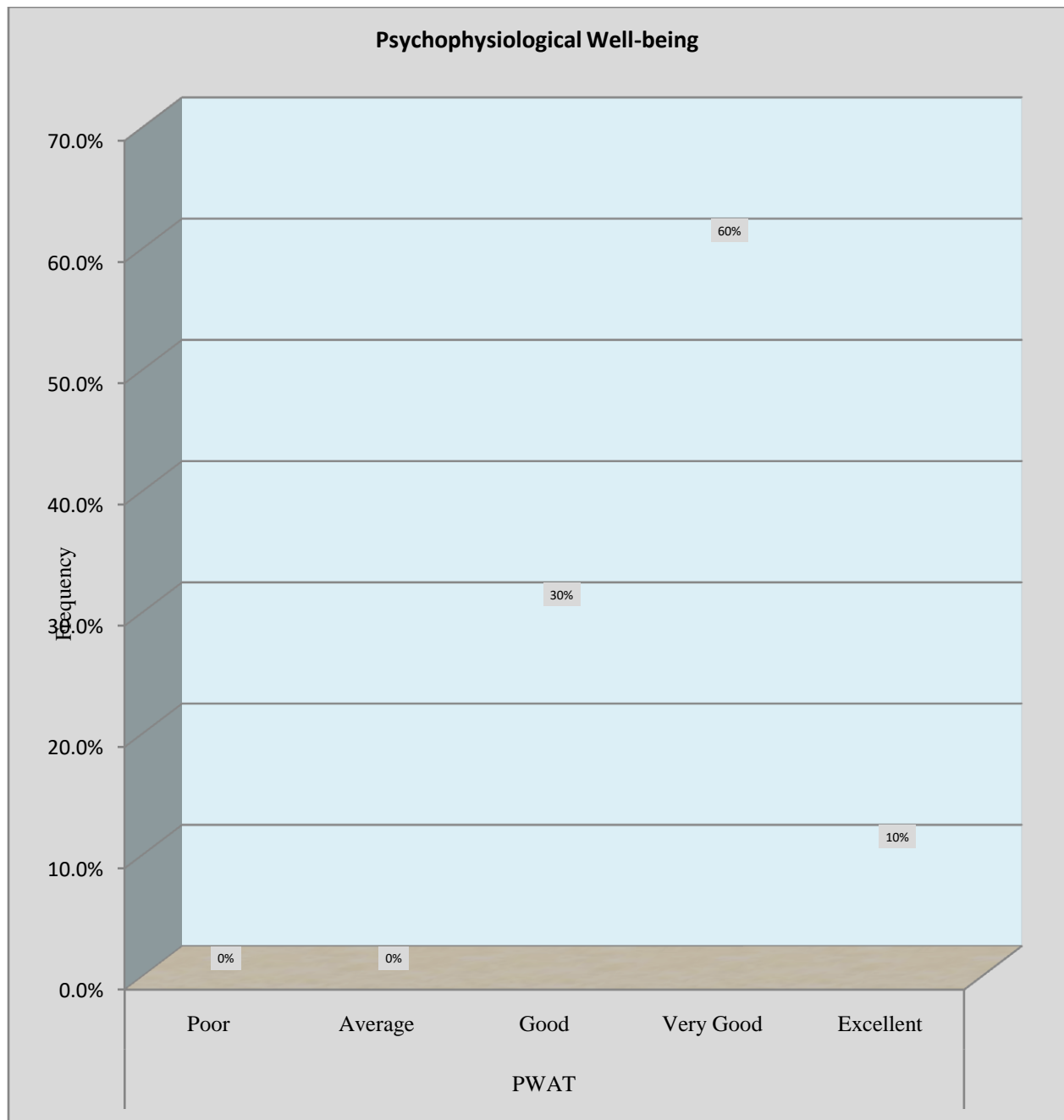
In 2<sup>nd</sup> try out ten (10) items were expressed difficult and incompatible having mean 2.5 or less than 2.5 were excluded from the tool. These were 03 items from physiological mode, 07 items from psychological mode. Reliability statistics of PWAT-II showed  $r=.78$ . PWAT-II was prepared with 42 items

In Expert's opinion two items were deleted. All the experts suggested to add one item "Do you have alopecia?" which was excluded in second round of item analysis. So this item was added in the psychophysiological well-being assessment tool. 41 items were finalized for PWAT-III which was categorized under 2 subheadings: Physiological wellbeing (1-18) and psychological wellbeing (19-41).

In 3<sup>rd</sup> try-out of item analysis each item was expressed very good item except 03 items having zero variance so removed from the scale. The PWAT was prepared with 38 items. Reliability statistics of PWAT-III showed  $r=.73$ . PWAT was sent to experts for 3<sup>rd</sup> Delphi round. At this point, no suggestion was given by any panelist. There was no deletion, no addition and no modification. Researcher was successful to obtain common consensus from the panel and finally PWAT-III was finalized with 38 items which were categorized under 2 subheadings: Physiological wellbeing (1-16) and psychological wellbeing (17-38). **Finally the researcher was successful to develop the valid and reliable tool.**



2. To assess the Psychophysiological well-being of breast cancer patients by Psychophysiological Well-being Assessment Tool (PWAT).



**Figure 2: Psychophysiological well-being of breast cancer patients by Psychophysiological Well-being Assessment Tool (PWAT).**

3. To assess the physiological well-being of breast cancer patients by psychophysiological well-being assessment tool (PWAT).

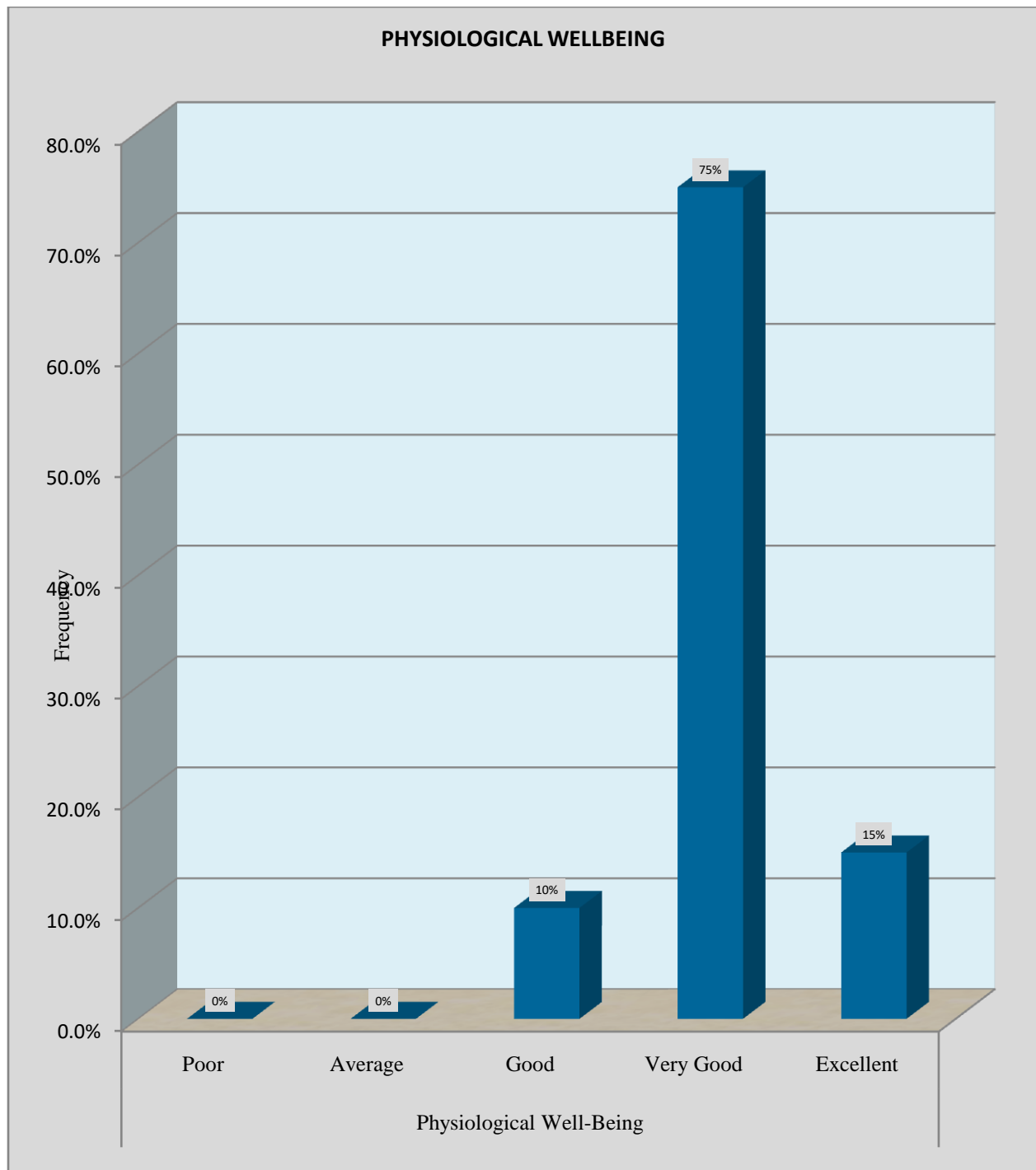


Figure:3 Physiological well-being of breast cancer patients by psychophysiological well-being assessment tool (PWAT).

4. To assess the psychological well-being of breast cancer patients by psychophysiological well-being assessment tool (PWAT).

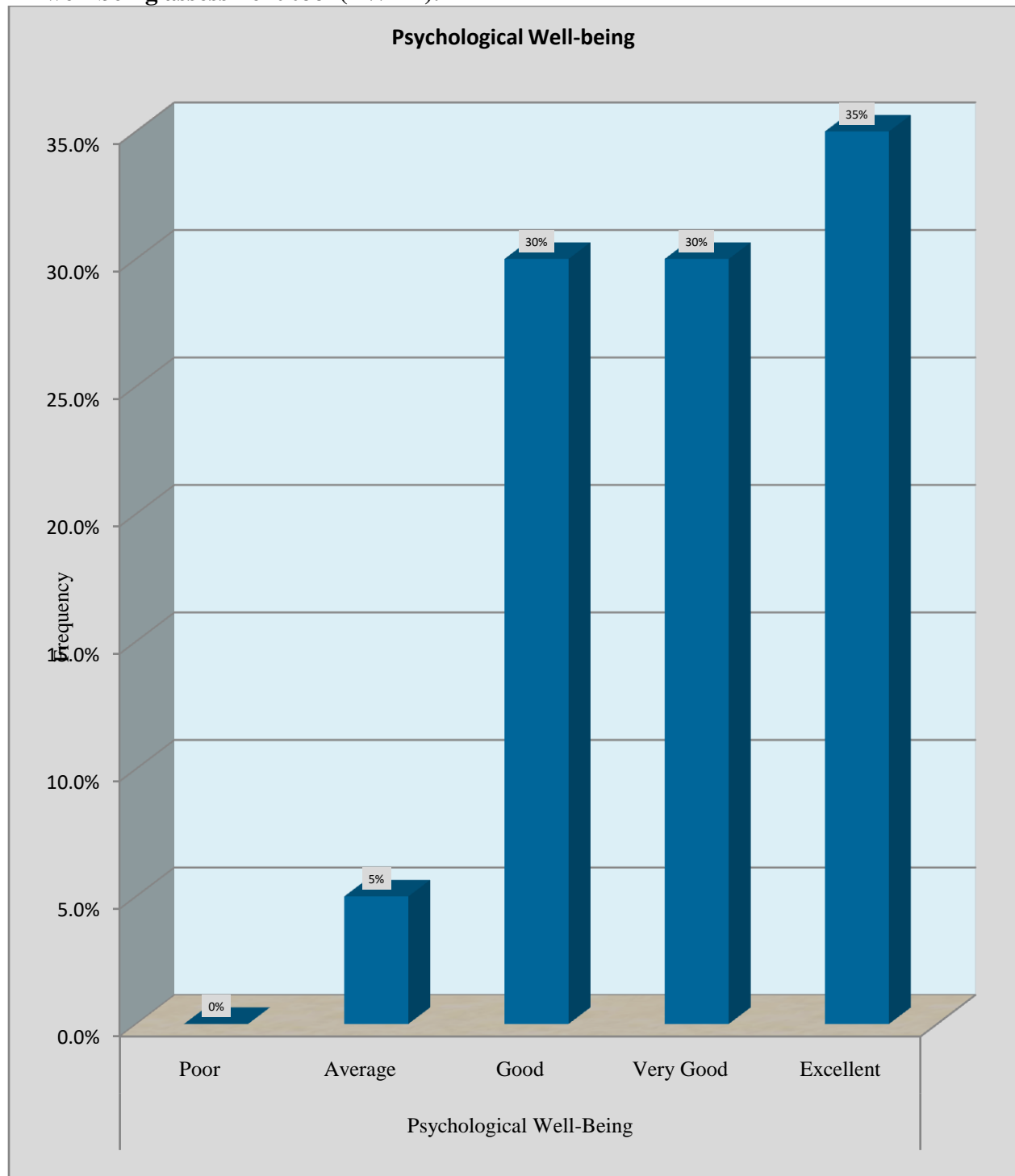
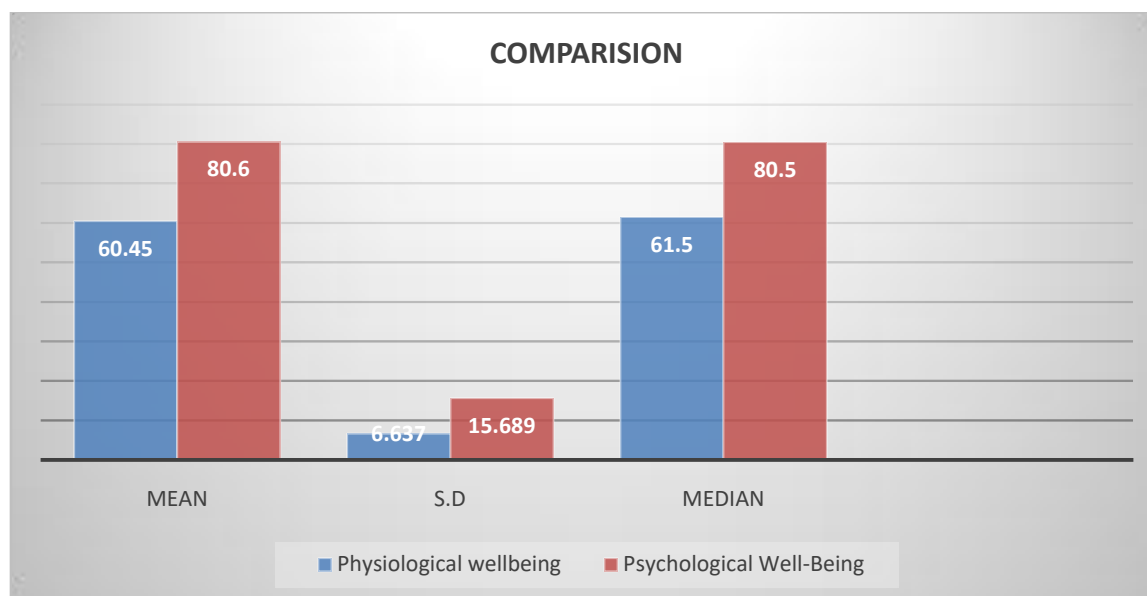


Figure:4 Psychological well-being of breast cancer patients by psychophysiological well-being assessment tool (PWAT).

### 5. To compare the physiological well-being and psychological well-being of breast cancer patients by psychophysiological well-being assessment tool (PWAT).



**Figure: 5 Comparison of the physiological well-being and psychological well-being of breast cancer patients by psychophysiological well-being assessment tool (PWAT).**

Following figure reflects the mean difference of physiological wellbeing and psychological wellbeing. The mean value of physiological wellbeing is 60.45 with stand red deviation of 6.637 and median value 61.5. Psychological wellbeing mean value is 80.60 with standred deviation 15.689and median value 80.5 which explain that post mastectomy breast cancer patients are having better psychological wellbeing rather than physiological wellbeing.

### FINDINGS

Out of 20 breast cancer post mastectomy patients:

- Maximum 12(60%) were having very good Psychophysiological wellbeing.
- Maximum 15 (75%) were having very good Physiological wellbeing.
- Maximum 7 (35%) were having excellent Psychological wellbeing.
- When mean values of Physiological wellbeing (60.45) and psychological wellbeing(80.60) were compared the mean difference was 20.15 which explain that post mastectomy breast cancer patients are having better psychological wellbeing rather than physiological wellbeing

### DISSCUSION

The present study mainly focuses on developing and testing the Psychophysiological Wellbeing Assessment Tool (PWAT) for its feasibility and reliability and its implementation. It has advanced the work of previous researchers. Researcher has given the direction to the clinical nurses to use this PWAT on breast cancer patients to assess their psycho physiological wellbeing so that timely interventions can be done, by this researcher has met both current and future demands of the healthcare organizations. By bridging the gap between the academic world of theory and the "real world" of practice, this study provides practical means of linking theoretical concepts to the planning and delivery of nursing intervention in specific health care situations.<sup>7</sup>

As the study evidenced that patients suffering from breast cancer have better psychological wellbeing rather than physiological wellbeing so the nurses working with those patients can focus their interventions on their physical wellbeing more rather than psychological wellbeing. This study is opposing the findings of **Sayad Riza et.al** who conducted a study aimed to evaluate the effects of Roy's adaptation model in nursing practice on the quality of life in patients with type II diabetes. Results indicated that use of Roy's adaptation model had positive effects on some physiological dimensions of quality of life in patients with type 2 diabetes; these domains were diabetes control, energy and mobility but further studies with longer durations were required as to investigate the efficacy of this model in the areas of anxiety and stress.<sup>8</sup>

Unfortunately to our knowledge, the tools developed for measuring wellbeing of patients with different problems in the clinical settings are not used by most of the nurses. Thus the nurses in clinical areas should be motivated to use this PWAT to assess the Psychophysiological wellbeing of not only breast cancer post mastectomy patients but other patients with different diagnoses, which is essential to quality of clinical care. Organizations should include the use of wellbeing tools into its policies for their application<sup>9</sup>

## CONCLUSION

So it can be concluded from the whole study that breast cancer post mastectomy females who are under radiation or chemotherapy or both were having healthier psychological wellbeing rather than physiological well-being. So by using this PWAT nurses can detect the weak area of wellbeing of the breast cancer patients and focus their interventions to make them physiologically and psychologically healthy.

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## **THE IMPACT OF POSITIVE POLITICS ON PUBLIC ADMINISTRATION OF KANDAHAR**

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### **ABSTRACT**

*The main significance of positive politics on public administration in Kandahar is one of the vital and greatest issue among the nation and it has drastically story behalf of a century. Positive politics and public administration has strong relationship for abiding of sound public policy in public administration of Kandahar rather than a century in administration and political processes which is indicatable social contracts, subject and debate. The level of politics must concentrate on over-all guidance of policy and better implemented in administration. The present subject is in view of the academic literature, under the proposed rubric of positive politics' well defined as the study of the impact of Positive politics on Public Administration for processes upon well-being of Kandahar. The purpose of this article is to elucidate the impact of positive politics on public administration of Kandahar. The impact of positive politics on public Administration is one of the greatest issue which has ancient background in Kandahar province.*

**KEYWORDS:** *Impact, Positive Politics, Public Administration, Kandahar.*

### **INTRODUCTION:**

The politics is the method of supportive and the public administration is the leading out of laws concentrated and considered by legislative members. Both are liked with each other, sometimes obtained to be altered. That is what each law needs to formally reviewed, interpreted in language of what the legislators targeted when they accept the law then it will be rewritten as regulations.

Policy is fascinating because people are disagreed. They disagree on behalf of how the live should be. Who should attain what? How the authorization and other resources could be distributed? Whether the society should be based on cooperation or based on conflict? The people are all so disagree pointing that how good the matters should be resolved and how could the decision of collection be decided? Who will have the rights to say? How the people should have influence and how much? For Aristotle this politics the 'master science' that is nothing less

than the prompts which human beings struggle to enhance their lives for stabilizing better society. Politics are social activity. It is always a speech and never a monologue. A scholar as Robinson Crusoe might be able to promote a simple economy, produce art etc. but they cannot indulge with politics. Politics exist only with the arrivals of a man or woman. Although the disagreement that lies at the heart of politics also spread to the nature of the subject and how it could be learned. People disagree about what it is that creates social inspiration politics. Whether it is where it obtains place and within government. The state or nation sphere generally or as a type of activity it indulges the calmness salvation battle or exercising hold over less powerful teams in society. Disagreement behalf of the nature of politics as an academic discipline that accepts an array of theoretical approaches and different of schools of analysis. Additionally, we can say worldwide tendencies have mobilized some speculate that the discipline parted between politics and IR has become now redundant.

The word used by Aristotle: as the father of political science the first imaginer to create use the term of politics in his treatise. The word politics is taken from the Latin word politicus, which is taken from the Greek word polis, which gives the meaning of city-state. Politics is the main dealing with the activities of the city-state. The Greeks utilized the term politika to emerge the totality of state phenomena or the great performance and affairs of the polis.

As it is identified that positive politics has strong relationship with administrations and there is no still end point for both of them whether administration is the part of politics or both of them are separated. The example could be mentioned that in the year of 1887 Wood Row Wilson the ex-president of USA declared that public administration is divided from the politics.

Woodrow Wilson how wrote the study of administration in 1887 was the idea that civil servants must be educated on politics and administration as politics of government strongly related on politics of any organization. The deviation of politics and public administration influenced the columnist who are classified as the second generation, as Gulick and Urwick who believed that both personal and public institutions should be enhanced directly the application of Henri Fayol's scientific management theory. For centuries politics are the basic of each country for the promotion and demotion in the world, nevertheless those politicians who are utilizing positive politics are the leaded politicians. Those are following negative politics are backward politicians for the public administration of the country. They are the generator of harmful for the society and they will not have calm life because of negative politics.

Impact: the action of one object returning forcibly into contact with one other, a known effect or influence; Oxford University. As one the main issue to recognize how the politics and administration are related by observing at promoted countries. Up to now there is some separation between politics and administration in developing countries, hence politicians in those countries has less power. Thus the administration is as the driving force behind the promotion. Even though some levels of law relations is observed between politics and public administrations.

In other context the balance and political crises and attractiveness and importance directly resolutions battle in public administration paid plenty attention for the impact of positive administration by positive politics in Kandahar.

Positive politics can enhance the country near to globalization which is the significant path for promotion and welfare condition for better public administration. Positive politics well identify the future of globalization father more it will be the reason for economic growth. Remove

poverty, eradicate battles, mobilize state capability to govern and international cooperation, also it is capable to convergence among the state, developing home economics.

However, it could be framed of existed research such as the consequence of globalization may be impacted of economics, politics, society and traditions. The impact of positive politics can affect economics growth, poverty, inequality, democracy, battles, state capability, policy and institutional convergence, cultural differences, volatility, and the diffusion of crises. And the balance of authorization between capital and labor. The other issue that can be considered is the relationship between political and nonpolitical or nation identifications.

The impact of positive politics on public administration of Kandahar will consider on both external and internal enhancement themes in Kandahar for better of people r society. Even though this subject is modified for enhancement of three main sub-dimensions: as political astuteness, inclusive skills, and visionary skill.

In promotion and under promoting countries the politicians are strong by working to current organizational leadership in large-scale crises as the global or worldwide crises, stabilized market needs and wants. By making good quality products and quality control to control the market and to contain the country from financially and economically.

The researcher also urged that national managers must hire strategic leadership to deal with politics. (Heymann,1987, Moore, 1995).

Positive politics can be able every politician to do the role of las and the power of state for better and seek of the country. Additionally, by positive politics we can apply role of las for the impact of positive politics in public administration of any country. We can determine the dimension parts. And levels of the rule of las can be identify as local order. Independent judiciary and latest justice, capability of the sociopolitical to structure implement and force the law, unless nonexistent rate of corruption, illegality and abuse of authority by state organizations and security forces that are honored of citizens' rights and are modern local's control. Positive politic impact on public administrations can implement rule of law as a resource of chances for political acts. Or as outcome of political process for procedure of the political mains. Quality with the content of the policies and qualities participated with the product of the political processes.

### **Public Administrations**

It is an academic discipline which is over hundred years aged whereas the public administration is an activity could be traced to the aged period of human background when man initiated living in managed societies.

Gerald Caiden has pointed the following significant points as said for public administration in contemporary society.

- a. Preservation of the polity.
- b. Maintenance of stability and order.
- c. Institutionalization of socioeconomic change.
- d. Management of large-scale commercial services.
- e. Ensuring growing and economic development.
- f. Protection of the weaker section of society.
- g. Formation of public opinion.
- h. Influencing public policies and political trends.

This has resulted in public administration becoming a key power constituent in modernized (both capitalist and socialist) and modernizing states in its own right.

Public administration is the management of affairs of the government at all levels- national, state and local.

**Public administration:-**

- a. Is cooperative group effort in a public setting;
- b. Covers all three branches-executive, legislative and judicial- and their interrelationship.
- c. Has an important role in the formulation of public policy and is thus a part of the political process.
- d. Is more important than, and also different in significant way from private administration
- e. As a field of study and practice has been much influenced in recent years by the human relations approach;
- f. Is closely associated with numerous private groups and individuals in providing services to the community.

Public administration is implemented within a political context. It is identified by which the policy decision created by the political decision makers are clarified. The public administration is decision-making scheduling the plan to be done, formulating goals and objectives. Working with law makers and citizen organizations to obtain public assessment and finance for government programs, establishing and practicing organizations, directions and monitoring the stuff, leadership, communications and gaining communications, identifying planning methods and procedures, appreciating performance and other functions implemented by governments.

The purpose and goals of government are recognized by (Basu, 2017).

To summarize, these definitions identify public administration with:

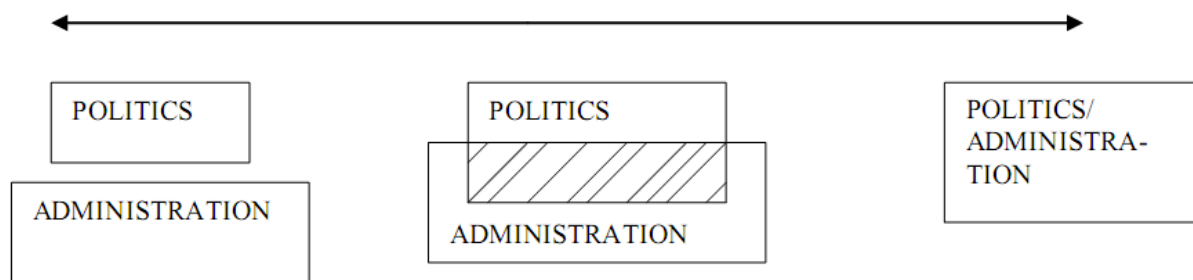
- 1. The formulation and implementation of public policies;
- 2. The executive branch of government;
- 3. Organizational structures and machinery of administration;
- 4. Administrative processes;
- 5. Bureaucracy and its activities;
- 6. Coordination of group activity or social relationship; and
- 7. Interaction between organizations and their environment.

**Politics:**

Politics and administrations- different but intertwined the most significant traits in current democracy is the appearance of huge administration members. Even if the logic of democracy represents general knowledge is stark difference to the logic of bureaucracy expertise, representations, financing to the local directly selections, balances, interpretation of laws and regulations the two seems tightly linked the democracies of today's are with the side lining public responsibilities.

The teaching which does not have huge bureaucracies looks very unrealistic (Bendix 1964).

In easy way the separation of between the politics and administrations can be shown as a continuum ranging from a total and clear distinction between politics and administrations to a condition where no distinction between the two spheres is.



In the above mentioned point of the continuum there is sphere where politics and administration is hard, if not possible to separate from each other's. This is the most general condition in political-administrative planes. If they belong to central regional or general government (Jacobsen 1996,1997 and 1998).

The relationship between politics and administration relates up for different fascia able questions: what is occurring in grey zone'? How is it organized? Who is authorized in this zone? Is it controlled by battle or by support?

In this paper I will only stress on the current, i.e. the degree of perceived battle between politics and administration and whether this condition is linked to the degree of central government regulations (Jacobson, 1999).

Some arguments for dichotomy between politics and public administrations raised for ages. Even though many scholars created attempts to conduct their research for why or why not politics and administration must be separated from each other. There is no global consensus on this subject. Gazing at both side of the argument, those who help that the two should be separated, declare that it will bring an efficient, effective and neutral bureaucracy. However, the largeness of this separation had not been identified stated to other teams who argue that the two disciples should not be distinct rest their thesis on the interconnection between politics and administration. Consider to a definition. Politics itself lacks an identified definition. The view has been utilized synonymously with government. So politics refers to what government performs. In this regard Easton definition is suitable "politics is the authoritative allocation of values in society" (Easton, 1953).

Simply it is defined public administration refers to the performance of the administrative organization of governments that exactly perform policies and programs. Thus authorizations policies become laws and these laws provide to make the administrative organizations with the fundamental important to perform these policies programs. This definition does not have struggle to provide a comprehensive clarifications of public administrations but it is connected to the purpose of this issue. Moreover, it is clear that the above definitions show a clear connection between the impact of positive politics and public administration in Kandahar.

### **Efficiency and effectiveness:**

Few years ago politics and public administration of Kandahar, authorization was corrupt. Politicians practice coercive powers so that to get duty perfected. In a struggle to deter corruption in government, a stress on efficiency and effectiveness changed. The efficiency and effectiveness are focused as criterion to size the performance of authorization. The performance measure are proof of successes and failure in social plans. The researcher of public administration, Fried (1976) focused on efficiency to be one of greatest performance criteria for public bureaucracy in America today. James Madison talked in the federalist papers that parted government into three



sections that was a way to place a checks and balance system on powers (Rainey, 2003 p.94). Madison ideologist explain how demands for efficiency and effectiveness commenced. Performance criteria deter corruption unethical behavior in authorizations. Too strong politic influence would not enable public administration to perform effectively and efficiently, that is why organizations would not be able to perform the objective participated with the other pillars of administrations.

The main objective of public organizations is rooted in the definition of efficiency and effectiveness has clarified in the literature as producing a better service at the lowest price possible while fixing a constant level of quality (Rainey 2003 p. 95) the overall public holds public servants accountable and responsible for hitting the objective with benefits. Former United States president Bill Clinton, started the local performance practice in replay to inefficient government. Clinton's struggle to streamline government caused in 324000 government jobs being rid (Rainey 2003 p.95). Efficiency and effectiveness could be hindered by unethical manner. Positive politics and public administration role the most significant in program and policy implementation. The efficient performance is imperative for producing effectiveness positive politicians. If efficient capable behaviors have not been indulged in or negative politics ruled in program or policy monitory is likely to emerge incompetence. Law enforcement agents, generally referred to street-level bureaucrats are given huge level of discretionary decision making authority. In time of chosen not to be performed a policy handed down from high-level monitors. They are not being countable, responsive efficient, legitimate or effective.

Measuring effective sometimes creates problems for local organizations as negative politics in public administration. Bureaucracies are sometimes overloaded with the selection of whether to measure effectiveness or goals measures (Rainey 2003 p. 136). Moot's studies identified of how organizations may join both a qualitative and quantitative nears to measuring effectiveness. If an agency adopts effectiveness it is highly deserved that public administrations have indulged in efficient strategies to perform programs and policies by the impact of positive politics in public administration.

## CONCLUSION

There would appear to be consensus to show the impact of positive politics on public administration of Kandahar. On last few years public administration was facing many administrative problems, challenges and corruption because of negative interference of politicians. As well as we know that there were misadministration, abuse of power, improper conduct, inexcusable delay, bribing public officials, bribing payments of public officials, discouraging of public employees, poor services delivery, no promoting in activities of municipality in Kandahar, and lack of commitment among public offices and staff.

But now we can see public administration of Kandahar that faced a big changes in developing of different sides of government and the promotion of specialists are increased in most of government offices of Kandahar. This is the impact of Positive politics that Kandahar has growth economically, working is going on in eradicating of poverty, inequality, eradicating of conflict, persuading state capacity, conducting of specialists in public offices to grow international cooperation, promoting domestic economics by which we can have industries all over Kandahar, promoting democracy in society and culture, less crises from business. Positive politics will bring transparency and transparency will bring the outcome of political engagement, sound policy selection is one of the most important job of government, development outcome,



participating of talented people in public offices, the right direction of society toward development, discerning of good, bringing diversity, pluralism of positive activities and solving of dialectic issues by positive politics in society, awareness's of society about public planes and policies to the society, the independency of media such as radio, television, newspapers, internet which has positive impact on applying of positive politics on public administration. The impacts of positive politics on public administration will successfully occur where, there is positive politics, so we can say that the positive politics has impact on public administration of Kandahar.

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## **IMMUNE STATUS IN PATIENTS WITH DUODENAL ULCER AND INFLUENCE ON HER IMMUNOMODULATORY THERAPY**

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### **ABSTRACT**

*The immunoreactivity was analyzed in 52 patients with duodenal ulcer (DU) and 36 healthy persons. The suppression of T-system and its subsets, a tension of humoral link of immunity was observed in patient. The use traditional method of treatment was not made a result to disorder of second immunodeficiency in patients with DU. The usage of Thymoptinum, the dose of which was 1,0 mg – 1,2 mg (in one course) at second group patients (n=24) with DU cured immune disorder, increased cell immunity, and had immunocorrection and eradication features. In a retrospective analysis of the results of immunological examination presented in the table, it was found that the acute phase of DUD was accompanied by a decrease in the level of the general population of T-lymphocytes (CD3). Thus, DUD in the recurrence stage is characterized by a deep deficit of most of the parameters of the body's immune system with a high HP infection of GMM and DMM. Predictors of ineffective eradication are a significant decrease in the number of CD3, CD4 and IRI, as well as a decrease in the concentration of IgA. Apparently, a positive shift in the functioning of the T-cell (an increase in CD3, CD4 and a decrease in CD8) component of the immune system contributes to the eradication of HP. In addition, an increase in B-lymphocytes (CD19) and IgA levels was observed in this group compared to the data before treatment ( $p < 0.001$ ). The purpose of this study was to study the parameters of immunity in patients with DUD and conduct antihelicobacter and immunocorrecting therapy in them.*

**KEYWORDS:** *The Immune System, T- And B-Link Immunity, Cellular Immunity, Humoral Immunity, Link, Thymoptinum Immunotherapy, Duodenal Ulcer, Helicobacter Pylori*

**INTRODUCTION:**

The etiopathogenesis of duodenal ulcer disease (DUD) associated with *Helicobacter pylori* (HP infection) is associated with contamination of the mucous membrane (MM) of the gastroduodenal zone - GDZ (gastric MM - GMM and DMM) with these cytotoxic strains of these bacteria [3, 4].

According to the concept [7], the development of various forms of gastroduodenal pathology depends on the resistance of the microorganism, and HP pathogenic strains can show their cytotoxic effect only when the immunobiological properties of the human body are reduced against the background of the developed immunodeficiency status [2, 5, 6].

The purpose of this study was to study the parameters of immunity in patients with DUD and conduct antihelicobacter and immunocorrecting therapy in them.

**MATERIALS AND METHODS**

52 patients with DUD were examined, of whom 37 (71.2%) were men and 15 (28.8%) women aged from 23 to 54 years. The duration of ulcerative history was on average  $6.2 \pm 2.4$  years. The diagnosis of exacerbation of DUD was confirmed endoscopically. The average size (diameter) of the ulcers was 0.9 cm. Contamination of the GMM was determined by urease test.

All patients showed a high degree of *Helicobacter pylori* (HP) infection. Depending on the treatment, the patients were divided into 2 groups: the 1st group (n = 28) received an eradication regimen consisting of Omeprazole (40 mg/day), De-nol (480 mg / day), Tinidazole (1000 mg/day) for 2 weeks; in the 2nd group (n = 24), the same treatment regimen with the 1st group was used, supplemented with Thymoptinum (Uzbekistan) (1 ml of 0.01%) solution subcutaneously every other day; for a course of 10-12 injections).

Cellular immunity was studied using monoclonal antibodies to CD receptors ("Sorbent Ltd", Russia) of the Institute of Immunology of the Ministry of Health and Social Development of the Russian Federation.

T-lymphocytes were determined (total population - CD3); T-helpers (subpopulation Th - CD4); T-suppressors (Ts subpopulation - CD8); B lymphocytes (subpopulation of CD19) and immunoregulatory index (IRI) - CD4 / CD8.

The level of serum immunoglobulins of classes A, M and G was determined according to Mancini (1968). Circulating immune complexes (CIC) were detected by Hascova.

Immunological examination was carried out for 2-5 days after the patient was hospitalized, and also 1 month after the treatment. The control group for comparison of immunological parameters was 36 practically healthy individuals (25-55 years).

**RESULTS AND DISCUSSION**

In a retrospective analysis of the results of immunological examination presented in the table, it was found that the acute phase of DUD was accompanied by a decrease in the level of the general population of T-lymphocytes (CD3).

Differences were found in groups with different outcomes of eradication therapy: patients with the 1st group had a lower T-cell content in the blood than patients with the 2nd group. Also in both groups there was an imbalance of T-cell subpopulations with a decrease in their helper share (CD4) and an increase in the number of suppressors (CD8); a significant decrease in IRI

and B-lymphocytes (CD19) was registered, which indicates profound changes in reactivity in patients with DUD.

With exacerbation of DUD in both groups, a significant decrease in IgA and IgM levels was observed with a simultaneous increase in IgG indices ( $p < 0.01$  in the 1st;  $p < 0.001$  in the 2nd group), which indicates violations in the humoral component of the immune system. Changes in immune homeostasis are also accompanied by a significant, 3-fold increase in the level of the CIC ( $p < 0.001$ ).

**TABLE. DYNAMICS OF CHANGES IN THE SYSTEM OF IMMUNITY STATUS IN PATIENTS WITH DUD IN THE PROCESS OF IMMUNOMODULATORY THERAPY**  
(M  $\pm$  M)

Indicators		Patients of the 1 <sup>st</sup> group	Patients of the 2 <sup>nd</sup> group	Control group
CD3 (%)	A	39 ± 1,2***	43 ± 2,3**	51 ± 2
	B	42 ± 1,4***	64 ± 2,6***	
CD4 (%)	A	25 ± 0,9***	23 ± 1,1***	36 ± 0,7
	B	28 ± 1,4***	44 ± 1,6***	
CD8 (%)	A	15,1 ± 1,4	16,5 ± 1,3	17 ± 1,2
	B	16,2 ± 1,6	19,1 ± 1,0	
ICI	A	1,6 ± 0,2**	1,5 ± 0,2*	2,1 ± 0,1
	B	1,7 ± 0,1*	2,3 ± 0,2	
CD19(%)	A	11 ± 1,2**	11,7 ± 1,5	15 ± 1
	B	13 ± 1,6	17,2 ± 2,1	
IgA, g/l	A	2,2 ± 0,3	2,3 ± 0,4	2,8 ± 0,3
	B	2,5 ± 0,5	2,9 ± 0,2	
IgM, g/l	A	1,3 ± 0,1*	1,2 ± 0,2*	1,6 ± 0,11
	B	1,02 ± 0,2***	1,5 ± 0,2	
IgG, g/l	A	20,4 ± 0,6***	19,4 ± 0,8**	15,9 ± 0,9
	B	19,6 ± 0,7***	18,7 ± 0,5**	
Note: A - indicators before treatment, B - indicators after treatment; *- p<0.05; ** - p<0.01; ***- p<0.001 compared to control.				

The formation of a peptic defect is not only the result of local damage to the DMM against an imbalance of aggression and the protection of HP microbial contamination, but also a consequence of a breakdown in adaptation, an imbalance in the immune system. DUD in most patients is associated with intestinal dysbiosis, microbial antigens of which can cause sensitization and exacerbate the immune deficiency in DUD patients [1].

Healing of the peptic defect was achieved in a shorter time with successful eradication of HP (in the 1st group - for  $24.8 \pm 1.2$  days with an eradication efficiency of 59%; in the 2nd group - for  $17.3 \pm 0.46$  days with an effectiveness eradication 86%).

After treatment, patients with the 1st group had lymphopenia; the level of the total population of T-lymphocytes CD3 (Table) was reduced, as was its helper CD4 fraction ( $p < 0.01$ ) with a high level of CD8 suppressors, which was significantly different from the corresponding parameters of the 2nd group. A reduction in the IRI to 1.5 at a rate of 2.1 confirms the imbalance in the CD4 / CD8 system in patients with ineffective eradication.

Patients of the 2nd group, after immunocorrective therapy, showed an effective increase in the number of T CD3, B cells (CD19) (Table), with a simultaneous increase in the proportion of Th (CD4) and IRI to 2.3 (normal 2.1), which was much higher than similar values from the 1st group ( $p < 0.001$ ). Apparently, a positive shift in the functioning of the T-cell (an increase in CD3, CD4 and a decrease in CD8) component of the immune system contributes to the eradication of HP. In addition, an increase in B-lymphocytes (CD19) and IgA levels was observed in this group compared to the data before treatment ( $p < 0.001$ ).

Thus, DUD in the recurrence stage is characterized by a deep deficit of most of the parameters of the body's immune system with a high HP infection of GMM and DMM. Predictors of ineffective eradication are a significant decrease in the number of CD3, CD4 and IRI, as well as a decrease in the concentration of IgA. On the contrary, clinical and endoscopic remission of patients of the 2nd group (immunomodulating therapy) was accompanied by a significant increase in the parameters of cellular-humoral immunity, which positively affected the results of eradication and immunocorrective therapy.

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## **IMPORTANCE OF SPRAY AIR FLOW VELOCITY IN CHEMICAL PROCESSING BETWEEN THE NOZZLE ARRAY**

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### **ABSTRACT**

*This article presents the methods and results of scientific research in the development of a device for spraying a suspension for cotton. In addition, in the cultivation of cotton, it is necessary to protect against weeds, their plums, too. Such urgent tasks can be performed by chemical treatment of cotton buds, that is, spraying the suspension, thereby achieving a significant increase in the yield of the cotton crop. It is necessary to perform during the growing season of the goose the number of transitions between the rows is increased due to the fact that various mashine-tractor aggregates are moving along the rut due to the large number of agrotechnological operations, which leads to increased soil density, resulting in a decrease in productivity. This can be explained by the fact that with an increase in the speed of air flow, the body of the goose is bent, and the complete non-contact of the chemical working mixture on the surface of small leaves leads to a decrease in the vegetation period of the goose and a decrease in crop yields. From the analysis of the results of the conducted research experiments, it can be concluded that the location of the spray device proposed in the chemical treatment of the surface of the body and leaves of the goose in relation to the body of the plant is of great importance in comparison with other factors.*

**KEYWORDS:** Chemical Working Compound; Gauze; Suspension; Ventilator Devices; Agrochemical Processing; Combined Sprayers.



**INTRODUCTION:**

Cotton plant and its fiber are the main technical crop in the territory of Uzbekistan. According to its characteristics, it is among the main raw materials inherent in the country's economy.

During the cultivation of high yields from agricultural crops, the cotton plant and its varieties are considered to be susceptible to various diseases, the causes of the occurrence of these diseases are mainly pests that have fallen on the plant body. In addition, in the cultivation of cotton, it is necessary to protect against weeds, their plums, too. Such urgent tasks can be performed by chemical treatment of cotton buds, that is, spraying the suspension, thereby achieving a significant increase in the yield of the cotton crop.

It is necessary to perform during the growing season of the goose the number of transitions between the rows is increased due to the fact that various mashine-tractor aggregates are moving along the rut due to the large number of agrotechnological operations, which leads to increased soil density, resulting in a decrease in productivity. Therefore, the use of combined aggregates in order to reduce the number of transitions on the basis of agrotechnical requirements in the processing between the range of porous remains effective.

**MATERIALS AND METHODS**

Based on the results of the conducted studies, it can be said that when processing a goose with a Khu-4 chop cultivator, it is possible to carry out the combined processing with a special spraying device installed in it. The height of the installation of the spraying device can be adjusted depending on the period of development of the plant, ensuring the perfection of the processing of the plant body and leaves.

According to the results of the experiment, when testing the aggregate at different speeds during the first chop of the cotton crop (husks), the dependence of the spray on the number of working flour and sprinkler triplets and the coverage width was studied. As a result of scientific theoretical research in this area, the range of the coverage width of the sprayer is determined as 3.6 m.

Aggregate work productivity ( $W$ ) is determined using the following expression.

$$W = 0,1B V_u, \text{ ha/soat}$$

where:  $B$  - spray processing width, m;

$V_u$  - aggregate speed, km/h.

In the processing of the sprayer, the fluid consumption per unit time ( $q$ ) is adjusted in proportion to the period of development of the crops. We determine the consumption of Bunda liquid by the following expression.

$$q = n \cdot q_1$$

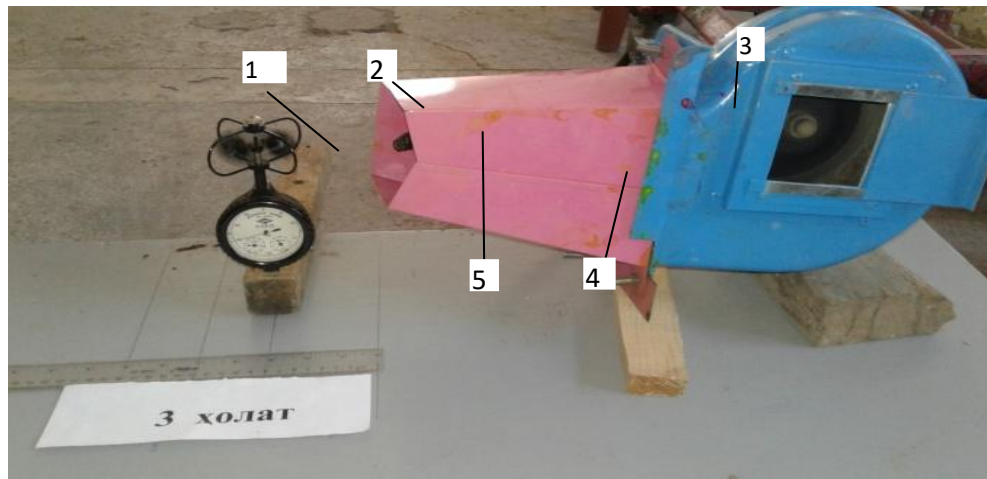
where:  $q_1$  - working fluid consumption of suspension separator, l/min;

$n$  - number of sprinklers, pieces

We determine the working fluid consumption ( $Q$ ) of the sprayer in the processing of one hectare of space using the following expression

$$Q = \frac{q}{w}, l/ga$$

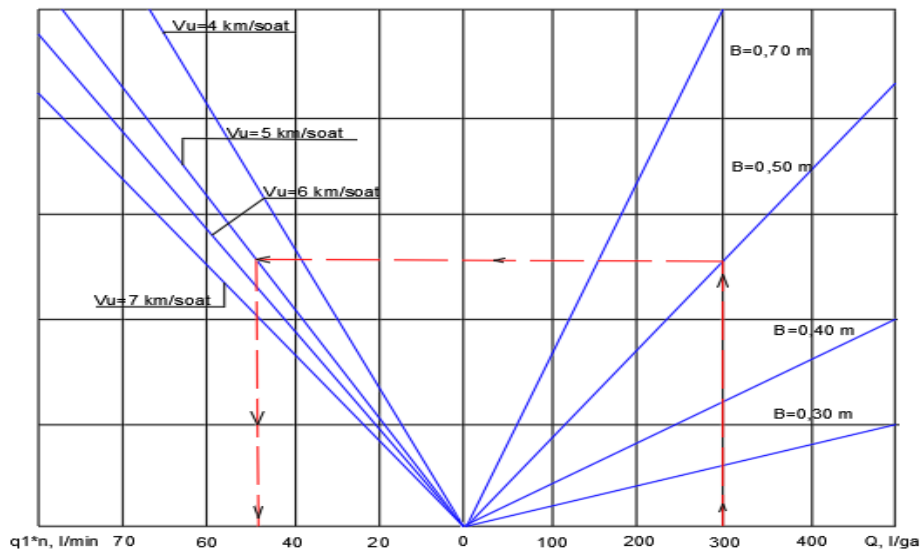
The air velocity coming out of the spray gun was determined using an anemometer measuring instrument in laboratory tests (Figure 1).



**1-picture. The ventilator sprayer device and anemometer used in the study:**

**1-Chuck anemometer; 2-spray tip; 3-ventilator zaslonka; 4-ventilator body; 5-ventilator handle.**

1-the picture depicts the general appearance of the ventilator sprayer, in which the determination of the air flow rate is described by the anemometer 1 and the spray tip 2, the adjustment of the ventilator air intake 3, the ventilation housing 4, the implementation of the ventilator sop 5.



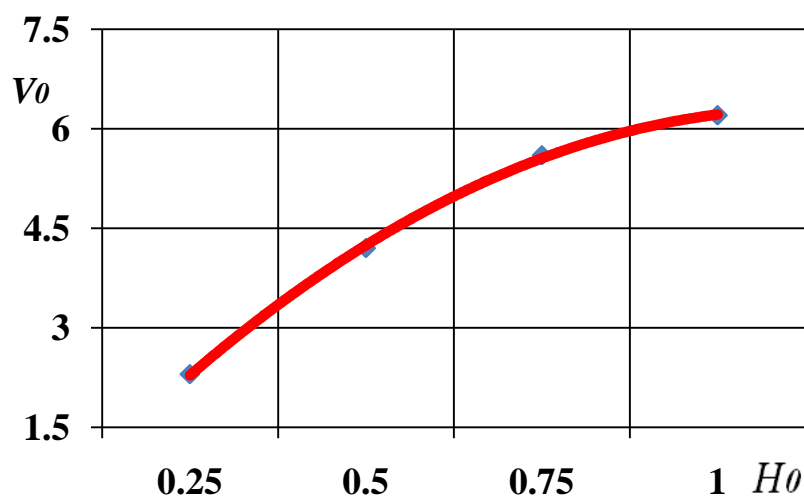
**2-picture. Adjusting the installation distance of the spray tip relative to the plant body, and functional fastening nomogram to the aggregate speed.**

As can be seen from this nomogram in Figure 2, when the speed of movement of the aggregate is close to 7 km/h, the location of the spray device relative to the nozzle will be 0,40 CM. When the height of the nozzle is 20-25 cm, the speed of the air flow coming out of the spray Valve is

3,5...4 M / s ni, while the degree of coating of the bud ost and OST of the sprayed working fluid is 80...It is up to 90%.

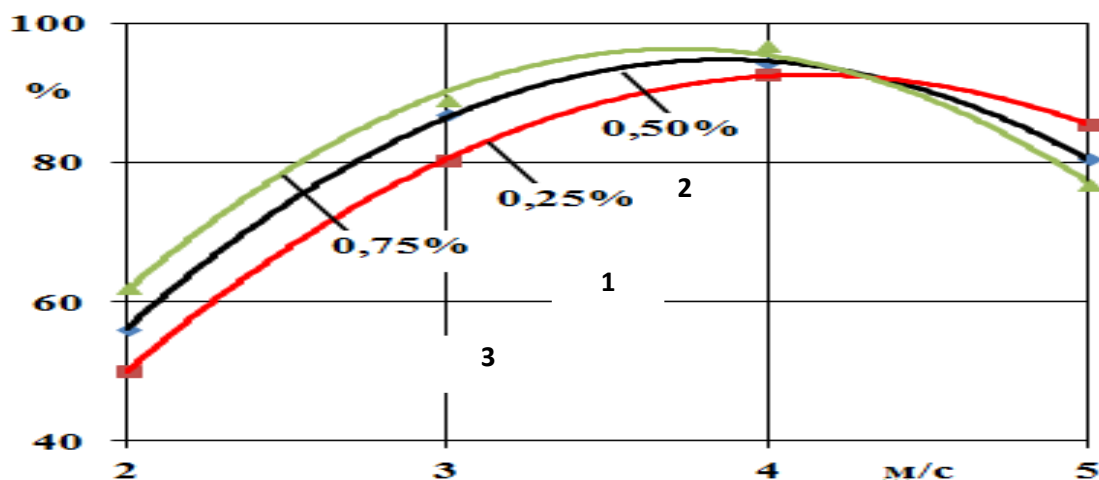
It is important that the working yield of the aggregate and the chemical compound coverage of the trunk and leaves of the crops are covered. Therefore, the location of the spraying device in relation to the crop body masofasi was studied depending on the stage of development of the crop, the degree of coverage of the plant with a chemical compound.

Obtained results.



3- picture. Functional bonding graph of the state of the ventilator zaslonkasi to the air flow rate.

The functional linking graph between the speed of air flow coming out of the suspension spraying stalk by adjusting the position of the ventilator air valve (zaslonka), which was determined by the studies, was presented in Figure 3. As can be seen from the graph, the speed of the air flow when the air valve (zaslonka) is fully opened is 5...Made up 6 m/s.



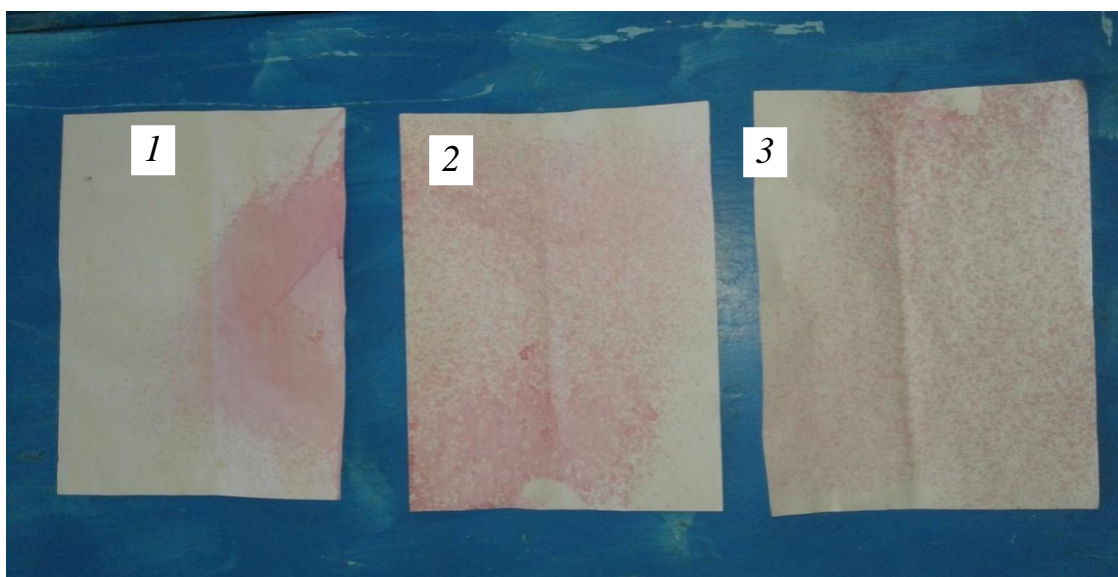
1- 4-picture. Functional bonding graph of the air flow rate at the level of covering the surface of the leaves with a chemical compound (suspension) :

**2- 1 - when the ventilator zaslonka is opened by 0,25%; 2-when the zaslonka is opened by 0,50%; 3-when the zaslonka is opened by 100%, when it is fully opened.**

It is well seen from the Figure 4, where the spraying mixture has a first degree of fluidity, which affects the coverage of the surfaces of the plant body and its leaves grown with the mixture. The air flow coming out of the suspension spraying handle is 3,5...When 4 m/s, the body of the goose and the surface of the leaves should be covered with a chemical mixture 80...It was 90 %. This indicator decreased while the air flow rate reached 5 m/s.

This can be explained by the fact that with an increase in the speed of air flow, the body of the goose is bent, and the complete non-contact of the chemical working mixture on the surface of small leaves leads to a decrease in the vegetation period of the goose and a decrease in crop yields.

When spraying, the air flow rate was 2 m/s, when the processing surface of the paste was low, that is, the coating rate of the body of the paste reached 40%, when the air flow rate was 3 m/s and higher, it covered 80% of the plant surface.



**5-picture.** To determine the degree of coverage of the working surface by the conditionally colored working solution under the influence of air flow at different speeds:

1-when the air flow rate is 2 m/s;

2-when the air flow rate is 3 m/s;

3-when the air flow rate is 3,5-4 m / s.

## CONCLUSION.

From the analysis of the results of the conducted research experiments, it can be concluded that the location of the spray device proposed in the chemical treatment of the surface of the body and leaves of the goose in relation to the body of the plant is of great importance in comparison with other factors. To this end, the spraying of the working fluid from the bottom and top side to the surfaces of the transferred direct plant body and leaves increased the degree of coating with a suspension liquid by 90%. To do this, the air flow rate of the sprayer is an average of 3,5...The

designation in the range of 4,0 m/s led to an excellent coating of the surfaces of the bark and leaves with a suspension fluid. This leads to an increase in productivity as a result of increased efficiency in the fight against diseases and pests of the larynx.

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## **CELLULAR AND HUMORAL IMMUNITY FACTORS OF ANIMALS VACCINATED AGAINST THE BACKGROUND OF ACUTE POISONING WITH DICHLOROPROPAPHOSOMES**

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### **ABSTRACT**

*In this article, we presented the data of experimental studies on Karakul lambs with the dichloropropaphos pesticide tested in acute poisoning on cellular and humoral factors of animal immunity. This pesticide is a light oily liquid with a characteristic odor of dithiophosphates. Dichloropropaphos is an insecticide used to control pests of vegetable, citrus crops, vines, and cotton. The drug is considered medium toxic [2,3,6,7]. However, the acute toxicity of the pesticide for young productive animals and the effect on immunobiological reactivity have not been studied. The aim of the work was to determine the degree of negative influence on the processes of formation of the immune response to various pathogens, and especially when vaccinating animals against infectious diseases. Acute intoxication of animals with this drug causes inhibition of the functional state of immunocompetent cells, which is manifested by a decrease in T- and B-lymphocytes and HCT-positive peripheral blood neutrophils; a decrease in total protein and its fractions, immunoglobulins of M and G classes and titers of specific antibodies in its serum. To a greater extent, the B-system of immunity is damaged. All this leads to the formation of active immunity of low tension and a significant decrease in the body's resistance to various infections.*

**KEYWORDS:** *Insecticide, Immunity, Lymphocytes, Vaccine, Immunoglobulins, Albumin, Globulins, Colibacteriosis.*

### **INTRODUCTION**

Given the important role of the immune system in maintaining the homeostasis of a living organism, as well as resistance to various infections, we studied some features of the immune response in animals (Karakul lambs) exposed to a corpuscular antigen against the background of acute poisoning with dichloropropaphos.



## **MATERIALS AND RESEARCH METHODS**

For research we used as a pesticide - a 50% dichloroprophos emulsion concentrate (ke) manufactured by Bayer Germany.

The experiments were performed on 6 lambs of Karakul breed of 4 months of age. The content and feeding of experimental animals was carried out in accordance with the standards adopted in the vivarium of UzNIVI.

Acute intoxication was reproduced by a single injection of aqueous suspensions of the drug through an esophageal flexible probe at a dose of LD 50 (125 mg / kg a.a.

In animal blood, protein fractions (serum) were determined by refractometry, and protein fractions were determined by paper electrophoresis.

The possible negative effect of dichloroprophos on the immunobiological reactivity of animals was evaluated on the basis of a set of indicators, including: determination of populations of E- and EAC-rosette-forming lymphocytes, according to the guidelines of the WIEV [1]; determination of the concentration of serum immunoglobulins - by the method of radial immunodiffusion [4], titers of specific antibodies - in the agglutination reaction (conventional method); the phagocytic activity of neutrophils in the HCT test [5].

For immunization of animals, a concentrated GOA-vaccine UzNIVI against colibacteriosis and salmonellosis of young farm animals was used according to the developed instructions for its use. Vaccination was carried out 5 days after the application of a pesticide (the initial period of the apparent clinical recovery of poisoned animals), experimental lambs.

## **RESEARCH RESULTS**

Studies have shown that acute intoxication of lambs with dichloroprophos at a dose of LD 50 caused significant impairment of the functional state of immunocompetent cells.

So, already on the 5th day after the introduction of the pesticide in the peripheral blood of experimental animals, the absolute values and the relative number of E- and EAC-rosette-forming cells decreased. Moreover, the decrease in T-lymphocytes of both relative and absolute contents was statistically significant and 20% less compared to their initial level.

B cells were suppressed to a greater extent and on the 5th day of experiments, their relative and absolute content in the peripheral blood of poisoned lambs was 29% lower ( $P < 0.02$ ) than the initial values of these indicators.

The most pronounced changes in this period were observed on the part of formazan-positive neutrophils, the content of which decreased by 65%, compared with the initial level. Consequently, an organophosphorus preparation dichloroprophos in a dose of LD 50 when productive animals enter the body of young animals causes a significant decrease in the functional state of immunocompetent cells, most pronounced 5 days after acute poisoning. These materials indicate the negative effect of dichloroprophos on non-specific defense factors and the immunological reactivity of animals.

Subsequent vaccination of experimental lambs against colibacteriosis, carried out 5 days after acute pesticide poisoning, caused an immunological rearrangement of their body, characteristic of the formation of an immune response. At the same time, there was an increase in the relative

and absolute number of T- and B-lymphocytes, the values of which on the 28th day after vaccination reached maximum values exceeding the initial level by more than 1.5 times.

Vaccination caused in the blood of poisoned lambs a statistically significant increase in the percentage of farmazan positive neutrophils by more than 2 times, compared with their level before exposure to dichloroprophos.

When studying the content of whey proteins in experimental lambs, it was found that the concentration of total protein 5 days after acute poisoning decreased by 12%. On the part of protein fractions, significant changes were detected only in the content of gamma globulins, which decreased almost three times ( $P < 0.001$ ), compared to their initial level. Antigenic stimulation of the animal organism with a colibacillus vaccine caused a slight increase in the content of total protein and its fractions. However, these changes were statistically unreliable, compared with the concentration of protein and its fractions in the serum of lambs before the experiments.

An analysis of the dynamics of changes in individual protein fractions — a decrease in albumin, as well as alpha, beta, and gamma globulins in the serum of experimental lambs, indicates some correlation with the concentration of class M and G immunoglobulins (table 1). So, before vaccination, in animals the content of immunoglobulins M was reduced by 12%, and the concentration of immunoglobulins G was the same as before the introduction of the pesticide. After the use of the vaccine, the biosynthesis of immunoglobulins of the indicated classes was significantly enhanced, and on the 28th day of the post-vaccination period, the content of immunoglobulin M in the blood serum of poisoned lambs was 2, and that of immunoglobulin G was almost 1.5 times higher compared to their initial level.

It is also characteristic to note some features of antibody formation in vaccinated lambs subjected to acute poisoning with dichloroprophosphos (table 2). So, 5 days after the introduction of the pesticide

**TABLE 1. THE CONCENTRATION OF IMMUNOGLOBULINS M AND G CLASSES IN THE BLOOD SERUM OF LAMBS**

Indicators	Statistic indexes	Source level	during the experiments			
			Between 5 days after acute poisoning	after vaccination, between (days)		Before infection (h / s30 days after the start of the experiments)
				7	21	
Immunoglobulin M (mg / ml)	M	0,90	0,79	1,68	1,81	1,81
	±M	0,05	0,04	0,06	0,04	0,04
	%	100	88	187	201	201
	P	-	< 0,2	< 0,001	< 0,001	< 0,001
Immunoglobulin G	M	12,2	12,3	16,4	17,4	17,4
	±	0,28	0,34	0,32	0,59	0,59
	%	100	101	134	143	143

(mg / ml)	P	-	< 0,5	< 0,001	< 0,001	< 0,001
	π	6	4	4	4	4

At a dose of LD<sub>50</sub>, titers of agglutinins to *Escherichia* autostrains decreased almost 2 times (P < 0.05). Subsequent vaccination of poisoned lambs against colibacteriosis caused an increase in antibody formation in them, however, an increase in the titers of specific antibodies was statistically unreliable compared to the initial level, which can also serve as an indicator of a low specific immune response under the influence of acute dichloropropaphos poisoning.

**TABLE 2. LOGARITHMS (IG) OF REVERSE TITERS OF ANTIBODIES TO E. COLI IN LAMBS VACCINATED AGAINST THE BACKGROUND OF ACUTE POISONING WITH DICHLOROPROPAPHOSOMES AT A DOSE OF LD<sub>50</sub>**

Indexing	Statistic indexing	Baseline	In the period of experiences:			
			Between 5 days after acute poisoning	After vaccination in (days):		Before infection ( in 30 days after the start of experiments
				7	21	
Ig E.coli	M	0,6	0,3	0,7	0,5	0,5
	± M	0,1	0,0	0,0	0,1	0,1
	%	100	50	117	83	83
	P	-	< 0,02	< 0,5	< 0,5	< 0,5
Number of animals	π	6	4	4	4	4

One of the proofs of the low intensity of immunity against colibacteriosis was also experimental infection of experimental lambs with a daily microbial culture of *Escherichia* in a titrated dose of LD100 (15 billion / ml).

After infection in the experimental lambs, the development of clinical signs of colibacillosis (depression, fever, nervous phenomena, and diarrhea) was observed, which ended in their 100% death. Among intact (control) vaccinated against colibacteriosis lambs subjected to a similar infection with a culture of *Escherichia* in a dose of LD 100, there were no deaths.

## RESEARCH RESULTS

Thus, acute poisoning of animals with dichloropropaphosomes at a dose of LD 50 (125 mg / kg) leads to a decrease in the functional state of immunocompetent cells, factors of nonspecific protection and antibody formation, which causes the formation of active immunity of low tension. A colibacillus vaccine against the background of acute poisoning of animals with dichloropropaphosomes loses its protective properties. The data obtained indicate a pronounced effect of the pesticide on the immunobiological reactivity of the organism of young farm animals.

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## **CURRENT STATE OF PRODUCTION AND USE NITRATE AND SODIUM NITRITE, AND CALCIUM**

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### **ABSTRACT**

*Sodium nitrite can be obtained in two ways: by reacting sodium sulfate with calcium nitrite or nitrate, calcium nitrite, formed after the absorption of nitrous gases with lime milk. Study of mutual solubility of the quaternary water system of nitrites, nitrates and sulfates of sodium and calcium and its constituent ternary systems at 25<sup>0</sup> C. Their isothermal solubility diagrams has been set up. Nitrite-nitrate solutions of sodium or calcium obtained by alkaline absorption are processed into sodium or potassium nitrate, respectively. These methods have not received wide, practical application due to the high cost of alkali of sodium, potassium and the lack of systematic research. For acidic soils, the control of the disease is liming, for the rest - the addition of calcium nitrate, calcium chloride, gypsum, phosphogypsum, simple superphosphate, which, however, does not completely eliminate calcium starvation.*

**KEYWORDS:** *Binary and ternary water systems, eutonic solutions of facet ternary systems, temperature control, figurative points, four-water calcium nitrate, isothermal method.*

## INTRODUCTION

Some nitrogen-fertilizer plants have special facilities for the partial absorption of exhaust nitrogen oxides with alkali solutions to produce mineral fertilizers in the form of nitrites of sodium, potassium or calcium nitrates. Nitrite-nitrate solutions of sodium or calcium obtained by alkaline absorption are processed into sodium or potassium nitrate, respectively. These methods have not received wide, practical application due to the high cost of alkali of sodium, potassium and the lack of systematic research.

In this regard, the aim of this work was to study the production, based on local raw materials and nitrous gas, of nitrate and nitrite salts of sodium and calcium. Calcium nitrite is one of the main raw materials for the production of sodium nitrite.

Sodium nitrite is used in the manufacture of azo dyes, in the construction industry as an additive to concrete to accelerate its hardening, in the food industry as a substance preserving meat and meat products, in the production of iodine as an oxidizing agent for the separation of iodine from salts, in the machine and machine-building industries for thermal hardening of parts, as well as a protective agent against atmospheric corrosion. It is used in the pharmaceutical, metallurgical, paper, rubber and textile industries, in medicine and agriculture for the destruction of dodder - a colored parasite on alfalfa, as well as a reagent in laboratory and research practice [1].

At the end of the 80s Scientific and Production Association "Carbonate" proposed using a mixture of chloride and calcium nitrite in an amount of 20-30 g per 1 m<sup>2</sup> as a new effective reagent for snow removal. Calcium chloride gave it a high melting ability, and calcium nitrite had protective functions and a stimulating effect on plant growth.

The role of nitrogen compounds in agriculture is widely known. Calcium plays a very extensive functional role in plant life [2].

Therefore, the role of calcium in the metabolism of various substances in plant tissues is enormous. Therefore, it refers to macronutrients in which the plant has a significant need [3-4].

Calcium is a widespread element: its content in the earth's crust is 3.25%. In the soil it is present in the form of silicates, carbonates, gypsum, in the soil solution - in the form of salts: nitrate, bicarbonate, chloride, etc. Calcium has a great effect on soil fertility.

The main source of plant nutrition for calcium is soil calcium, absorbed and calcium carbonate.

The lack of calcium may be due to losses from the soil due to leaching and as a result of the removal of this element with crop yields. The removal of calcium from grain crops is 20–40 kg, peas and flax - 43–60 kg, sugar beets –70–80 kg, potatoes — 10 kg, alfalfa and clover — 100–250 kg, grass (hay) –70 kg, cabbage 300-400 kg of CaO per hectare [5-6]. Naturally, these calcium losses increase with increasing crop yields. However, in practice, calcium losses during soil leaching and the use of fertilizers that increase the acidity of the soil (ammonium nitrate) are much greater than those carried out with the crop.

For cotton on sandy and sandy loam soils, the minimum content of calcium soluble in acetate-buffer solution was set at about 200 mg / kg of soil, and for calcium soluble in 0.5n HCl, 300 mg / kg, for light loamy and dusty loamy soils it was equal to 200 and 500 mg / kg respectively.

Therefore, constant liming is a necessary procedure on all soils that do not have natural sources of lime. Even in areas with low rainfall, lime application should be at least 3–4 tons of CaO per 1 ha or 5–6 tons CaCO<sub>3</sub> (crushed) per 1 ha. These measures need to be repeated every five years



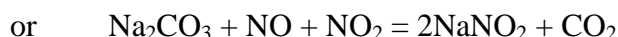
to make up for the loss of calcium on heavily used agricultural land due to leaching and the use of fertilizers rich in nitrogen and potassium.

For acidic soils, the control of the disease is liming, for the rest - the addition of calcium nitrate, calcium chloride, gypsum, phosphogypsum, simple superphosphate, which, however, does not completely eliminate calcium starvation. A more effective measure is spraying plants during a period of strong fruit growth with a 0.5-1% solution of calcium nitrate or calcium chloride (1-2 times a week). The most encouraging results are obtained by the combination of these two methods: it not only suppresses the disease, but also increases the yield.

Calcium nitrate is widespread in nature, in all cultivated soils and in most soils under wild vegetation; nitric acid formed during the nitrification process binds to calcium, and therefore, the flow of nitrogen into plants occurs mainly from  $\text{Ca}(\text{NO}_3)_2$ . At the same time, this is the best form for applying nitrogen with fertilizer to soils with insufficient calcium content, since in this case, unlike sodium nitrate and ammonium salts, even with abundant and frequent application, not only the deteriorating effect on the soil structure cannot be observed but on the contrary, gradual improvement of physical properties due to the entry of calcium into the absorbing complex instead of hydrogen [4-4] should occur on podzolized soils.

The most common industrial method is based on the absorption by alkalis or soda of nitrogen oxides from the exhaust gases of the production of nitric acid [1,2,7].

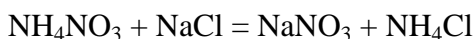
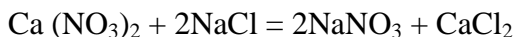
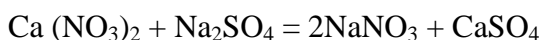
When nitrogen oxides are absorbed by alkali, the following reactions occur:



The solutions obtained as a result of alkaline absorption of nitrous gases (nitrite-nitrate liquors) can be processed into sodium nitrite. The ratio between sodium nitrate and sodium nitrite in the resulting liquors depends on the temperature and oxidation state of nitrous gases [1, 7].

The process of absorption of nitrogen oxides is carried out in such a way as to obtain a liquor, if possible with a high content of nitrite and with a lower content of nitrate. This can be achieved by reducing the oxygen content in the gas entering the absorption, so that by the time the gas approaches the alkaline towers, the oxidation state of the nitrogen oxides contained in it corresponds to an equimolecular mixture of  $\text{NO} + \text{NO}_2$ .

In the conversion method, sodium nitrate can be obtained by exchange decomposition by the following reactions:



Each of these reactions has its own specific features. So, during the exchange decomposition between calcium nitrate and sodium sulfate, it is necessary to introduce an excess of calcium

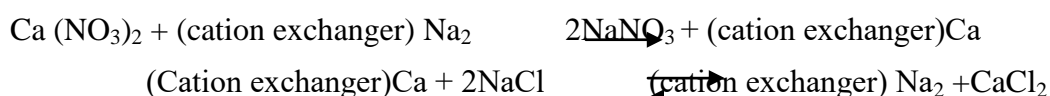
nitrate into the process, which partially enters the product and makes it hygroscopic. The precipitation of gypsum leads to a strong thickening of the reaction mass. In order for it to remain sufficiently mobile, it is necessary to dilute it with a solution of sodium nitrate after separation of gypsum from it, that is, to return part of the solution to the reactor. The rate of exchange decomposition depends on temperature. So, in this case, at 50 ° C the reaction is much faster than at 70 ° C; within one hour, the conversion will reach 96% at 50 ° C, and at 70 ° C only 11%. In order to obtain a coarse-grained, easy-to-filter out gypsum precipitate, seed must be introduced by adding crystalline gypsum to the reactor, etc. [1]

Of interest is the development of new methods for the production of sodium nitrate, which do not require alkali costs. Such methods include the preparation of sodium nitrate from NaCl and nitrogen oxides, as well as the method of cation exchange.

The process of producing sodium nitrate by cation exchange consists mainly of three stages:

1. Preparation of the solution  $\text{Ca}(\text{NO}_3)_2$ .
2. Cation exchange and regeneration (ion exchange  $\text{Ca}^{2+}$  on ions  $\text{Na}^+$ )
3. Evaporation of the solution  $\text{NaNO}_3$ , crystallization of salt, centrifugation, drying and packaging.

The reactions occurring in the first two stages of the process can be schematically expressed by the following equations:



In this case, there is a continuous alternation of processes for the production of calcium nitrate and the regeneration of calcium cation exchanger with solutions of sodium chloride.

The intermediate stages of the process are: washing with water cation exchange resin, evaporation and crystallization of the converted solutions.

The described method has found industrial application in Norway.

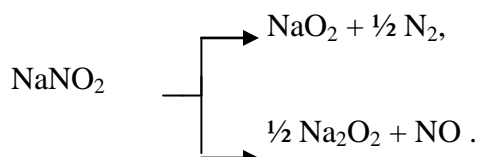
In subsequent years, other methods were developed for the production of sodium nitrate [8–9].

In the method [8], sodium sulfate is dissolved in 60% nitric acid. After cooling the solution to 200C, crystals of sodium nitrate precipitate from it, which are easily filtered. After washing and drying the crystals, sodium nitrate is obtained. The resulting mother liquor, containing mainly sulfuric acid, is sent to the production of complex fertilizers.

In the production of sodium nitrite in most technologies, nitrite must be isolated from mixtures of different salt composition and therefore it is necessary to analyze the work on the study of systems containing sodium nitrite.

Salt systems were studied by researchers in the state of melt and aqueous solutions. To determine the behavior of sodium nitrite, the thermal properties of pure nitrite were investigated.

Experiments were also carried out to crack crystals of sodium nitrite [10]. It was established that during the mechanical destruction of sodium nitrite, oxygen is not detected at all, but is mainly recorded NO and N.



The properties of melts containing sodium nitrite have been studied by a number of authors [10-11].

Component Behavior in a Ternary System  $\text{Na}_2\text{SO}_4$  -  $\text{NaNO}_3$  -  $\text{H}_2\text{O}$ , studied by the visual-polythermal isothermal solubility method in a wide temperature range. Polythermal and isothermal solubility diagrams for temperatures were constructed. 0,20,25,30,35,50,75,100,120°C [11]. As a new phase, the formation of a hydrated compound of composition  $\text{Na}_2\text{SO}_4 \cdot \text{NaNO}_3 \cdot \text{H}_2\text{O}$

Solubility in the ternary system  $\text{NaNO}_2$  -  $\text{NaNO}_3$  -  $\text{H}_2\text{O}$  considered by a number of authors in the temperature range 0-103°C. A simple eutonic-type system without the formation of solid solutions and new chemical compounds based on the starting components. A feature of the solubility diagrams is that the crystallization branch of sodium nitrate noticeably expands with increasing temperature, and the length of the crystallization branch of sodium nitrite decreases. System components have a mutual salting out effect on each other. Due to the good solubility in the binary system, sodium nitrite reduces the solubility of sodium nitrate to a greater extent than the latter solubility of sodium nitrite.

Fourth Cross Water System  $2\text{Na}^+, \text{Ca}^{2+} // 2\text{NO}_3^-, \text{SO}_4^{2-} - \text{H}_2\text{O}$  Despite its theoretical and practical value, it has not yet been studied. This system consists of four binary and four triple water systems. Binary and ternary water systems are well lit in the literature for various temperatures [11].

Therefore the study of the quaternary system  $2\text{Na}^+, \text{Ca}^{2+} // 2\text{NO}_3^-, \text{SO}_4^{2-} - \text{H}_2\text{O}$  on 25<sup>0</sup> C It was limited to the preparation of only compositions of eutonic solutions of triple edge systems.

The equilibrium in the system at 250 ° C occurred with constant temperature control and intensive mixing of the phases after 1.5-2.0 days. The system was studied by defining 18 figurative points (Table 1). Based on the obtained data, a system state diagram is constructed  $2\text{Na}^+, \text{Ca}^{2+} // 2\text{NO}_3^-, \text{SO}_4^{2-} - \text{H}_2\text{O}$  on 25<sup>0</sup>C в equilateral quadrangle (Fig. 1).

Peculiarity of heterogeneous phase equilibria in quaternary reciprocal systems  $2\text{Na}^+, \text{Ca}^{2+} // 2\text{NO}_2^-, \text{SO}_4^{2-} - \text{H}_2\text{O}$ ;  $2\text{Na}^+, \text{Ca}^{2+} // 2\text{NO}_3^-, \text{SO}_4^{2-} - \text{H}_2\text{O}$  and triple  $2\text{Na}^+ // 2\text{NO}_2^-(2 \text{NO}_3^-), \text{SO}_4^{2-} - \text{H}_2\text{O}$ ;  $\text{Ca}^{2+} // 2\text{NO}_2^-(2 \text{NO}_3^-), \text{SO}_4^{2-} - \text{H}_2\text{O}$  to justify and establish optimal conditions for the production of nitrite, sodium and calcium nitrate, new experimental data on the technology for producing solutions and crystalline calcium nitrate and calcium nitrite from limestone and nitrogen compounds (nitrous gases and nitric acid).

**TABLE 1. SYSTEM SOLUBILITY DATA  $2\text{Na}^+$ ,  $\text{Ca}^{2+}$ //  $2\text{NO}_3^-$ ,  $\text{SO}_4^{2-}$ - $\text{H}_2\text{O}$  ON  $25^\circ\text{C}$ .**

№	The composition of the liquid phase, %					indexing			Solid phase
	2Na NO <sub>3</sub>	Ca(N O <sub>3</sub> ) <sub>2</sub>	Na <sub>2</sub> S O <sub>4</sub>	CaS O <sub>4</sub>	H <sub>2</sub> O	Ca <sup>2+</sup>	2N O <sub>3</sub> <sup>-</sup>	H <sub>2</sub> O	
1.	-	58,25	-	0,01 2	41,7 38	1,00 00	0,99 97	6,52 10	Ca(NO <sub>3</sub> ) <sub>2</sub> ·4H <sub>2</sub> O+CaSO <sub>4</sub> ·2H <sub>2</sub> O
2.	5013	48,23	-	0,26 0	46,3 80	0,90 75	0,99 41	7,83 81	Ca(NO <sub>3</sub> ) <sub>2</sub> ·4H <sub>2</sub> O+CaSO <sub>4</sub> ·2H <sub>2</sub> O
III.	8,80	42,84	-	0,34 0	48,0 20	0,83 59	0,99 21	8,44 95	NaNO <sub>3</sub> +Ca(NO <sub>3</sub> ) <sub>2</sub> ·4H <sub>2</sub> O+CaSO <sub>4</sub> ·2H <sub>2</sub> O
IV	10,46	51,58	-	-	37,9 6	0,83 64	1,00 00	5,60 31	NaNO <sub>3</sub> +Ca(NO <sub>3</sub> ) <sub>2</sub> ·4H <sub>2</sub> O
5	28,62	20,82	-	0,43	50,1 3	0,43 59	0,98 95	9,32 19	NaNO <sub>3</sub> +CaSO <sub>4</sub> ·2H <sub>2</sub> O
6	46,15	1,28	-	0,48	52,0 9	0,04 01	0,98 75	10,2 219	NaNO <sub>3</sub> +CaSO <sub>4</sub> ·2H <sub>2</sub> O
7	37,51	-	4,58	0,48	57,4 3	0,01 36	0,86 05	12,4 316	NaNO <sub>3</sub> +CaSO <sub>4</sub> ·2H <sub>2</sub> O
VII I	30,72	-	8,47	0,45	60,3 6	0,01 35	0,74 16	13,7 505	NaNO <sub>3</sub> +CaSO <sub>4</sub> ·2H <sub>2</sub> O+NaNO <sub>3</sub> ·Na <sub>2</sub> SO <sub>4</sub> ·H <sub>2</sub> O
IX	30,43	-	8,91	-	60,6 6	-	0,74 04	13,9 276	NaNO <sub>3</sub> +NaNO <sub>3</sub> ·Na <sub>2</sub> SO <sub>4</sub> ·H <sub>2</sub> O
10	26,53	-	11,2 4	0,43	61,8 0	0,01 34	0,65 45	14,3 916	CaSO <sub>4</sub> ·2H <sub>2</sub> O+NaNO <sub>3</sub> ·Na <sub>2</sub> SO <sub>4</sub> ·H <sub>2</sub> O
XI	22,57	-	14,3 6	0,43	62,6 4	0,01 34	0,56 01	14,6 685	CaSO <sub>4</sub> ·2H <sub>2</sub> O+NaNO <sub>3</sub> ·Na <sub>2</sub> SO <sub>4</sub> ·H <sub>2</sub> O+ Na <sub>2</sub> SO <sub>4</sub> ·CaSO <sub>4</sub> ·2H <sub>2</sub> O
XII	22,14	-	14,7 8	0,36	62,7 2	0,01 12	0,54 95	14,6 876	Na <sub>2</sub> SO <sub>4</sub> ·10H <sub>2</sub> O+Na <sub>2</sub> SO <sub>4</sub> ·CaSO <sub>4</sub> ·2H <sub>2</sub> O+ NaNO <sub>3</sub> ·Na <sub>2</sub> SO <sub>4</sub> ·H <sub>2</sub> O
XII I	22,26	-	15,0 1	-	62,7 3	-	0,55 33	14,7 139	Na <sub>2</sub> SO <sub>4</sub> ·10H <sub>2</sub> O+NaNO <sub>3</sub> ·Na <sub>2</sub> SO <sub>4</sub> ·H <sub>2</sub> O
14	12,96	-	15,8 3	0,35	70,8 6	0,01 35	0,40 06	20,6 715	CaSO <sub>4</sub> ·2H <sub>2</sub> O+Na <sub>2</sub> SO <sub>4</sub> ·CaSO <sub>4</sub> ·2H <sub>2</sub> O
15	9,74	-	17,7 3	0,30	72,2 3	0,01 210	0,31 08	21,7 459	Na <sub>2</sub> SO <sub>4</sub> ·10H <sub>2</sub> O·Na <sub>2</sub> SO <sub>4</sub> ·CaSO <sub>4</sub> ·2H <sub>2</sub> O
16	7,28	-	16,8 7	0,30	75,5 5	0,01 36	0,26 42	25,5 916	CaSO <sub>4</sub> ·2H <sub>2</sub> O+Na <sub>2</sub> SO <sub>4</sub> ·CaSO <sub>4</sub> ·2H <sub>2</sub> O
XV II	-	-	18,3 7	0,24	81,3 9	0,01 35	-	34,4 514	CaSO <sub>4</sub> ·2H <sub>2</sub> O+Na <sub>2</sub> SO <sub>4</sub> ·CaSO <sub>4</sub> ·2H <sub>2</sub> O
XV III	-	-	21,2 9	0,21 0	78,5 0	0,01 01	-	28,7 593	Na <sub>2</sub> SO <sub>4</sub> ·CaSO <sub>4</sub> ·2H <sub>2</sub> O+Na <sub>2</sub> SO <sub>4</sub> ·10H <sub>2</sub> O

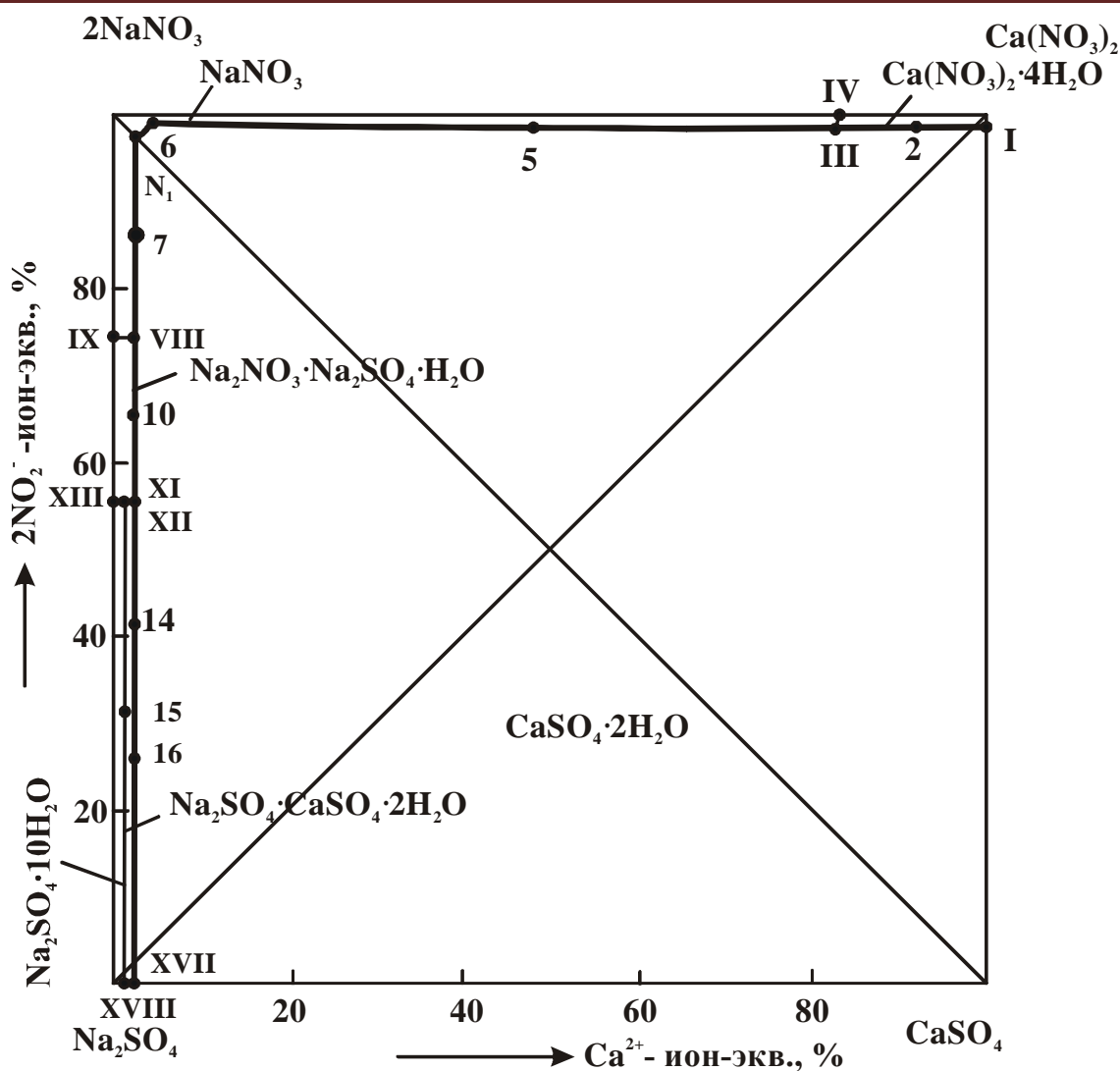


Fig. 1. System solubility diagram  $2\text{Na}^+, \text{Ca}^{2+} // 2\text{NO}_3^-, \text{SO}_4^{2-} - \text{H}_2\text{O}$  on  $25^\circ\text{C}$

As can be seen from fig. 1. The state diagram of the studied system is characterized by the presence of six salt crystallization fields converging at four isothermally invariant points of the joint existence of three different solid phases.

The first field, delimited by points I-III-IV, corresponds to the crystallization of four-water calcium nitrate. Point III is triple and corresponds to the crystallization of sodium nitrate, two-water calcium sulfate and four-water calcium nitrate. The second field (between points III-IV-VIII-IX) takes the second place in terms of volume of area and corresponds to the release of calcium nitrate. The third field belongs to the combination of sodium nitrate and sodium sulfate. –  $\text{NaNO}_3 \cdot \text{Na}_2\text{SO}_4 \cdot \text{H}_2\text{O}$ , which is separated from the fields of other salts by points VIII-IX-XI-XII-XIII. The fourth field (between points XI-XII-XVII-XVIII) borders on the fields of gypsum –  $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ , mirabilite –  $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$ , connecting  $\text{NaNO}_3 \cdot \text{Na}_2\text{SO}_4 \cdot \text{H}_2\text{O}$  and corresponds to the loss of a double compound –  $\text{Na}_2\text{SO}_4 \cdot \text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ . The fifth field in the extreme part of the diagram, delimited by points XII-XIII-XVII-XVIII, belongs to the mirabilite -  $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$ .

The sixth field, occupying the main part of the diagram, is located between three isothermally invariant (III-VIII-XI) and two monovariant (I-XVII) points and indicates gypsum crystallization -  $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ .

From the results of the study of the system  $2\text{Na}^+, \text{Ca}^{2+} // \text{SO}_4^{2-}, 2\text{NO}_2^- - \text{H}_2\text{O}$  on  $25^\circ\text{C}$  it follows that crystallization fields  $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$  and  $\text{NaNO}_2$  on the isothermal diagram they are in contact with each other in a wide concentration range; therefore, they are a stable salt pair of this system and can almost completely form in an aqueous medium from an equimolecular amount of sodium sulfate and calcium nitrite.

Thus, from the results of the study of systems  $\text{NaNO}_2 - \text{CaSO}_4 - \text{H}_2\text{O}$  и  $\text{NaNO}_3 - \text{CaSO}_4 - \text{H}_2\text{O}$  on  $25^\circ\text{C}$  it follows that the greatest solubility of calcium sulfate in the systems is observed in the presence of, respectively, 22.796 and 25.176% nitrite and sodium nitrate. Above these concentrations of sodium salts in the systems under study, there is an inverse proportion between the solubility of calcium sulfate and the content of nitrite and sodium nitrate in solutions. In other words, the higher the concentration of nitrite and sodium nitrate in the solution, the lower the solubility of calcium sulfate in the solution. From this it follows that during the evaporation of 22.0 - 25.0% solutions of sodium nitrite and sodium nitrate containing calcium sulfate, gypsum is released into the bottom phase.

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## **THE SPECIAL ROLE OF PHYSICAL EDUCATION AND SPORT TO CREATE A HEALTHY LIFESTYLE**

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UZBEKISTAN

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### **ABSTRACT**

*Article is fulfilled with basic factors, which are vital to keep well. As we know, in order to be stay healthy one should follow some rules as keeping diet or doing regularly exercise. In article one can find profitable information about the role of sport and its usage in healthy lifestyle. Furthermore, there are extra points for teachers of PE not only exerciser, but also psychologically matters which should be learned by coaches. One of the second subjective problems of the teacher of physical culture is the special peculiarities of the activities. Physical weakness, rhythmic gymnastics and track and field athletics are the most common obstacles to his recovery. Our ancestors have always been valued for the many talents of Babur. We, as a human being, have a deeper understanding of human culture, not just the spiritual dimensions of it. After all, in Uzbekistan, wrestling, soccer, horseback riding, sailing, jockers, and shoting, Bobur's personal history cannot be overlooked. So, the competition has defined the "leader" for sporting methods, and students will be helping to organize their own independent sports competitions. Nowadays, the teacher of physical culture is the teacher of the legal education in the laws of physical education and sports in the country of high school, lyceums and colleges of independent Uzbekistan. Secondly, the teacher of physical culture is a talented and pedagogical teacher; You need to get used to doing it. The researcher is required to remember the movements of the various movements, the practice of what the students are doing or what they are doing during the lessons, and the rapid, brief interruption of the movement. As is well known, the physical culture law states that it is necessary for students to work at home to perform independent physical exercises. For bowling, each of the physical exercises needs to be accustomed to self-employment, but they need to develop creative thinking and self-release.*

**KEYWORDS:** *Healthy Lifestyle, Instructor, Sport, Training, Competition, Moral And Physical Quality, Failure, Keep In Shape.*

## INTRODUCTION

Nowadays, the peoples of Uzbekistan have experienced a great and difficult journey in historical development. The physical culture and sports, which have become independent of these peoples, have been filled with exciting events, as well as fights against hostile oppressors, massacres, and violence against local exploiters. One of the judges came and went. The people have given a bronze: The folklore, similar to Bobur, has survived its long tradition of children, who have lost the Yang, material and cultural ties, and has been deeply saddened by the development of military arts and physical culture. Our ancestors have always been valued for the many talents of Babur. We, as a human being, have a deeper understanding of human culture, not just the spiritual dimensions of it. After all, in Uzbekistan, wrestling, soccer, horseback riding, sailing, jockers, and shoting, Bobur's personal history cannot be overlooked.

At present, many activities are being carried out in the Republic, including national ideology, special national pride, national thinking and honour. At the IX Session of the Oliy Majlis of the Republic of Uzbekistan there were identified the radical changes in the system of education and training, the increase in the level of modernity, the upbringing of the younger generation. This is a highly qualified, experienced and professional who can meet our business goals, aspirations, the transformation of our society, our reforms and lives.

### Theoretical background

The social and economic developments in the country, the increasement of shunting, physical education and sports are also relevant to the field of sports psychology. The answer to the questions such as, "What kind of state do we build today?", "What should be the political and social basis, what image should be divided"?

At present, in the republic there are many empty, physical and cultural cultures. With every development in childhood and adolescence, physical education plays an important role. Physical culture teaches us the qualities of goodness, hard work, discipline, and morality. With the emergence of the human race, various movements will be needed. According to Ibn Sina, the various toxic substances in the uterine tissues are absorbed by sweat as the human moves.

## LITERATURE REVIEW

The main purpose of physical culture training in schools is to help or educate students from the first grade. Physical education should not be a personal affair, but it is imperative that all teachers of the human race should be aware of the needs of the community and teachers. Our business is not only for our own sake, but also for the busy people, for the country and for the motherland. Academic N.M Amosov said that Islam is not only a disability but also a different type of fast movement and quality of moving. The differentiation of the various movements is an indication of the imperfection of the war.

Engagement with physical culture exercises should be a constant and personal goal for every student in the rugged life, and the sophistication should be one of the most important activities for the right to develop, defend their homeland. As is well known, the physical culture law states that it is necessary for students to work at home to perform independent physical exercises. For bowling, each of the physical exercises needs to be accustomed to self-employment, but they need to develop creative thinking and self-release. Self-education is a free activity for every single person. In the pursuit of the right to freedom of education, each law-abiding student needs to know the following: (a) the power of self-taught methods of self-education; (b) Conversion of

abusers into a highly developed community; c) Abuse of the young people in the independent approach to the daily life of the educated, to become the most mobilized force for self-education; d) the strength of English and the right level of knowledge; e) the eagerness of the inner world of the intruder; (f) the acceptance of moral images; g) Building of willpower, cables.

Self-education comes in two forms:

1) Community and 2) individual forms. In the community, self-education of the students, physical culture, the training of various kinds of girls and girls, as well as the implementation of community affairs were implemented. In the course of the lesson, not a single collarbone should be required.

### **Main part**

As a matter of fact, the community provides the opportunity to educate and fulfill the obligations of the present day. If the uprisings of the upper class are tossed into the controversy of the trap, then a community thinking will emerge. As a result, the classroom community becomes an organized, strong force. In the individual form, every law enforcement has a clear commitment. In fulfilling this commitment, each individual's individual characteristics must also be taken into account.

It is necessary to follow the rules of self-education:

1. A clear and meaningful agenda should be separated from each other;
2. New commitments will be accepted after their release;
3. It is important to train students to work independently in the community;
4. Describe what training facilities to use in their own education.

For example, 7 Th class students have created a new Uzbek-language style:

(a) Not to be offended with minor things;

(c) a lack of willingness, that is, "even in the event of failure." The fate created by the self-proclaimed guerrillas gives results.

Formation of the moral and physical qualities of musicians, the formation of self-defense skills, the development of physical self-awareness and sports.

Following methods can be used to establish the practical skills of student education: b) to report for a period of time the moral and physical qualities of the most accomplished responsibilities of the businessman; c) analysis of the inherent obligations of force; the reasons for the successes and failures of the Englishman, and ability to control his own ability to control the rain; (e) To learn how to draw conclusions with the oppressed, self-asserted, self-absorbed traits. In the III box, the master should be accustomed to the pearl with the need to work independently. The school is dedicated to the strengths of the students' knowledge and to the organizational and pedagogical skills, knowledge and abilities of Uarnar. Fans need help with physical education, sports inventory, gym cleaning, sports training, and emergency situations. The student of the physical culture needs to be aware of the disadvantages of the students, and to evaluate the performance of the physical exercises. For example, the student of the VII class K. Akhmedov can be active, scorpions, and ice age, but low learning. Seasons: Geography and Physical Culture. However, the poor geography scores do not fulfill the duties of the cows. In the last few years, physical culture has focused only on "excellent" subjects. Jasmine's passion for ice-cream,

his enthusiasm for drills, and his ability to help organize lessons help teach the icebreaker and the icebergs by example. He is always ready to help physically disabled physicians. Volleyball, baseball, and most popular athletics are not welcome. As a physicist, he always helps with the organization of school and classroom competitions.

This is the kind of education that is the teacher of physical culture of the VII class. In some instances, unruly ice lessons may cause classroom attendance to slow down. In many cases these people feel like unnecessary drivers for the community, and sometimes Uarning's girls are involved in extracurricular activities in school and in the classroom. The high level of spiritual activity of the students depends on the high quality of physical culture lessons and competitions. So, nowadays, the methods of competing in the course of physical culture were used. From scratch, who is quick to print, who is long-haired, who brings the yolk to the bridge with the bridle, who hits the hurricane. In the course of such an organized competition, the volunteers are mobilized to help the poor. So, the competition has defined the "leader" for sporting methods, and students will be helping to organize their own independent sports competitions. Nowadays, the teacher of physical culture is the teacher of the legal education in the laws of physical education and sports in the country of high school, lyceums and colleges of independent Uzbekistan. Secondly, the teacher of physical culture is a talented and pedagogical teacher; You need to get used to doing it.

The teacher of physical culture is connected with different activities. Including sports lessons and sports activities, sports gym and playgrounds, swimming pools, lack of sports inventories, and a great deal of interest in physical culture lessons. Sooner, in the process of dying with the dirty jungle, there was a flurry of chaos, disillusionment, disorder, chaos, and a lot of team-building and training. . In the introduction of these problems, it is required that the teaching of the physical culture be brought to the forefront in the letter.

The skilled physical education instructor should be able to grasp the general physical education curriculum and make sense of the current shortcomings in the school, and allow the teacher of physical culture to remember the movement. The researcher is required to remember the movements of the various movements, the practice of what the students are doing or what they are doing during the lessons, and the rapid, brief interruption of the movement.

One of the main challenges faced by the teacher of physical culture is the degree to which methods can be combined with the specialties of flour. Including sports theory, physical education, pedagogy, psychology, physiology, sports medicine, philosophy and noise, and the need for ice racing, including athletics, gymnastics, basketball, volleyball, handball, soccer, wrestling. Otherwise, it will be difficult for a teacher of physical culture.

### **Analyses**

The subjective linguistics of the teacher of physical culture can be studied in two groups. The first group consists of the inductive features of the teaching of physical culture, the vices associated with personal characteristics, the types, structure, temperature, characteristics of the nervous system. For example: whitewashing nervous system, which has a choleric temperament, is characterized by strong imbalances and irregularities, its inability to function properly.

Students with phlegmatic temperatures often find it difficult to catch up with their students and their behavior. One of the subjective afflictions in the teaching of physical culture is that it is a goal that has emerged.

These include: lack of self-control, lack of proper planning of sports activities, incompetence in sports, disability, limited intellectual abilities, alcoholism, and so on.

One of the second subjective problems of the teacher of physical culture is the special peculiarities of the activities. Physical weakness, rhythmic gymnastics and track and field athletics are the most common obstacles to his recovery. The introduction of subjective kinship, first of all, to the teaching skills, the ability to use different types of armor, and ice-cold divisions of sports. His creative work, and the heavy lifting of his passion for the physical culture of the students, has helped him make the most of these addictions.

Physical culture is one of the emerging activities of the linguists and the educated, enlightened members of the teaching community. If these things are wrong the physical culture will cause poor-quality, teaching. For bowling, it is necessary to work together with teachers and class leaders, to involve students in sports, and to develop social activity. The teacher of physical culture is a great teacher. The billiard and the jigsaw pose are still alive today.

## **CONCLUSION**

As a result, the discipline in the classroom is frozen. The talented physical culture instructor organizes training activities, distributes the nets, and teaches the student every step of the way. The development of educational social services can be seen in the implementation of organizational activities. In particular, the training of sportsmen, the organization of qualitative training, the need for training of trainers, the need for proper training of gymnastics, strengthening of training and training of trainers.

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## **NAVIGATING BENDS OF RESEARCH ON SUSTAINABLE DEVELOPMENT**

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### **ABSTRACT**

*Sustainable Development is an area of both the 'Activists' and the 'Academicians'. Lately, academicians have worked based on the demand of the Activists, who represent some sort of consumerism. The domain of knowledge in this blend is the creation of the academicians and the activists. The nature of this knowledge most of the time is normative and is guided by the philosophy of Nested Model. The navigational bends are in the bounded frame of four ; a) the broad areas (options) of the research , b) the quality of research and required strategies, c) the ethics pertaining to research approach in sustainability, and d) Political views that these researchers augur as outcomes. The researcher has tried to evolve in this paper a balance among all the four]*

**KEYWORDS:** 'Me Generation', 'Sustainable Development', 'Nested Model', 'Stakeholder Consumerism', 'Libertarian Extension', 'Ecological Extension', 'Conservation Ethics', 'Deep Ecologist', 'Social Ecologist', 'Eco-Socialist', 'Eco-Feminist'.

### **INTRODUCTION**

The topic is of searching ideas or thoughts with a pathway that is approved by the empirical knowledge and that could be transformed into product of service with focus on human well being of economy yet not a one-to-one well being but that of the society of the present and future. This concept is necessary since the world through demand supply chain is sponsoring the concept of demassed marketing there by it is singular satisfaction oriented with most of the time concentrating to appease the 'Me Generation'<sup>1</sup>, who's greed is never ending and less benign to even the next person or others. Thus the areas of research, the ethics, the political thoughts or ideologies come into the picture since the outcomes of such cost, should lead to positive externality. While one develops on the above topic he will first of all start from the concept of

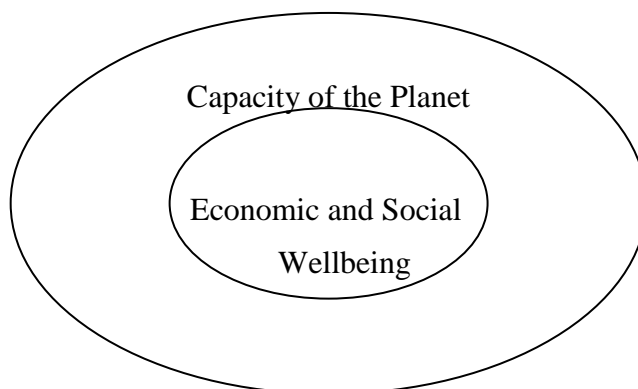
reasoning the domain of sustainability, the target audiences, the peripheral concepts in such field of research.

### Concept Development

‘Sustainable Development’<sup>2</sup> was first used in the Brundtland Report where in it refers that Sustainable Development is development that meet the needs of the present without compromising the ability of the future generation to meet their own needs. The ‘needs’ refer to the mandatory needs of the poor which should be the priority. At the same time ‘Development’ refers to a progressive transformation of economy and society. The term ‘society’ is distinct as it negates the presence of ‘standalone’ or ‘individual’. Here in comes the normative concept of the research.

Pandits of sustainability science have advocated a ‘Nested Model’<sup>3</sup>, wherein they refer it as one, with human wellbeing ensured while safeguarding sustained services to the environment. Diagrammatically, it could be represented in terms of inner-circle and outer-circle, just like a dough-nut. The figure is presented below:

Figure1, Showing the ‘Nested Model of Sustainability’ cacc CC



One finds in Figure 1, that the inner circle has the economic and social well being impregnated in the concept of Capacity of the Planet as per this nested model. All this has the purpose to provide goods and services to sustain life<sup>4</sup>. Thus this topic of Sustainable Development leads us to the areas of research therein in this field.

### Areas of Research in the field of Sustainable Development.

The ‘needs’ and ‘development’ are two basic concept in ‘Sustainable Development’. It has to be stated that this concept stated above goes beyond the concept of ‘Green’. Pandits often use the term ‘Green’ and ‘Sustainable Development’ synonymously. This is a myth. This clearance of this myth has been brought out by Hart in his path breaking writing of ‘Beyond Green’ published in Harvard Business Review in the year 1997( January-February, 1997), later incorporated in the Green Series publication of HBR. Stuart Hart, in this article states “Even if all companies, were to achieve zero emission by the year 200, the earth would still be stressed beyond what biologists refer to as its carrying capacity<sup>5</sup>.” According to Hart, the scourges of the late 20<sup>th</sup> century depleted forests, fisheries, agricultural lands, thereby choking urban natural habitat with pollution, poverty, infectious disease and migration which presently is spilling even across borders. Thus the facts stand that in meeting our needs, one is destroying the ability of future generation to meet theirs. A researcher’s insightful vision states the major part of the

problem stems from population explosion and rapid unplanned economic development in emerging economies spinning out the political and social issues that exceed the mandate and the capabilities of any corporation. This view of the author finds its backing in the writing of Hart. Thus it goes beyond 'Green' typified by the four criteria norms, i.e., regulatory compliances (provisions of Environment Act of state and that of stakeholders also), Environmental Management System, Eco-efficiency and Green Design<sup>6</sup>. Herein Hart again conforms that Corporations are the only organisation with the resources and technology coupled with the power to reach globally and ultimately the motivation to achieve sustainability. This logic of Hart finds its backing the flow of events. The Rio Earth Summit of 1992 ushered in the importance of natural environment to the mankind. A majority of world's government adopted sustainability as a goal. Over 1000 companies of the world soon followed, by signing the International Chamber of Commerce Charter for sustainable development. Of course, the challenge for the next generation of marketing managers do not culminate in signing up the charter only but in execution, one is referring to 'Business Charter of Sustainable Development'<sup>7</sup>. It has 16 Principles. Principle '9' is Research. It stand as;

### 9... Research

"To conduct or support research on the environmental impacts of raw materials, products, processes, emissions and wastes associated with the enterprise and on the means of minimizing such adverse impacts."

But this execution where? This answer is given in super-ordinate parameters of level of economies in which the corporate play. The reason why this document the researcher has referred is because it shows that the corporates who are now the accountable group more in this role of sustainability are doing research of the Sustainability issue. Again, the corporate are committed to this goal. The areas of research that have surfaced out are:

**TABLE 1: AREAS OF RESEARCH IN REFERENCE TO SUSTAINABILITY<sup>8</sup>**

Types of Economies	Negative Externality		
	Pollution	Depletion	Poverty
Developed Economies	<ul style="list-style-type: none"> <li>• Green House Gases</li> <li>• Use of toxic materials</li> <li>• Contaminated sites</li> </ul>	<ul style="list-style-type: none"> <li>• Scarcity of material</li> <li>• Insufficient reuse and recycling</li> </ul>	<ul style="list-style-type: none"> <li>• Urban and minority unemployment.</li> </ul>
Emerging Economies	<ul style="list-style-type: none"> <li>• Industrial emission</li> <li>• Contaminated water</li> <li>• Lack of sewage treatment</li> </ul>	<ul style="list-style-type: none"> <li>• Over exploitation of renewable resources</li> <li>• Over use of water for irrigation</li> </ul>	<ul style="list-style-type: none"> <li>• Immigration to cities</li> <li>• Lack of skilled workers</li> <li>• Income inequality</li> </ul>
Survival Economies	<ul style="list-style-type: none"> <li>• Dung and wood burning</li> <li>• Lack of sanitation</li> <li>• Eco-system destruction due to development</li> </ul>	<ul style="list-style-type: none"> <li>• Deforestation</li> <li>• Overgrazing</li> <li>• Soil loss</li> </ul>	<ul style="list-style-type: none"> <li>• Population growth</li> <li>• Low status of women</li> <li>• Dislocation.</li> </ul>

- Modified from the matrix in Hart, pp114.

Therefore the opportunities in regard to research are the ones stated above from the corporate view point. These corporates stay in the plasma of the society with consumers/stakeholders of various kind and the research objectives under environmental consumerism are based on the types of consumerism.

The consumerism in green marketing stem from the philosophy of the following, the Puritans, the Quakers, the Republicans, the Marxists, the Aristocrat and the Systems groups<sup>9</sup>. Each of these groups have had their own norms and in their quest of research the norms have been explicitly depicted. The consumerism depicted by them are the following.

The stakeholders consumerism in the domain of sustainability

Groups	Beliefs and norms
Puritan	Consumption culture is spiritual and therefore it defiles that which is holy by destroying land, polluting air and water and needlessly killing flora and fauna.
Quakers	Consumption culture is wasteful and ignores its true costs
Republican	Consumption culture encourages civic irresponsibility.
Marxist	Consumption culture is based on social injustices
Aristocrat	Consumption culture is threat to the survival of the system
Systems Perspective	Consumption seeks to impose order on complex dynamic by conceptualising Patterns of related objects and processes as systems.

The norms so stated by the groups become the hypothesis (es) that are tested by researchers hailing from such groups.

The summation of the list of areas therefore stems from the ways the corporate look at them and the ways the consumers look at them. This factualises to 21 topics that are of interest of the corporate and the topics pertaining to stakeholders.

The topics for the stakeholders are stemmed in their ideologies. The ideology being teleological. The end is known to the stake holders and the process is of lesser concern. Therefore it is sometimes even technocratic or at times management oriented or situational.

### Navigating the Bends

Before navigating the bends, one has to delve into the history of research activities undertaken by the scholars. Carlos Linnacus of Sweden and George Buffon of France in 18<sup>th</sup> century directed their research towards taxonomic programs. Their effort was followed by a group who worked their research on the similar lines of thought. To this group of scientists and their writings one finds that nature is a system of component parts to be tended, or operated like a machine, so that it helps or benefits human being. This school is referred as 'Imperialist'. There exists an assumption that this group of scientists have drawn their inspiration from the Christian theology of man's creation by God is for exploitation of nature. The scientists of 19<sup>th</sup>, 20<sup>th</sup> and this century are still working along this line. The objective is utilitarian and the ethics that they follow is the conservation ethics.

Around 19<sup>th</sup> century two important personalities David Henry Thoreau and Johann Goethe approached this science in a holistic manner. In flaps of poetry and literature attributed to nature they sought to preserve particularly valuable or striking landscapes from further exploitation<sup>10</sup>. Most probably this group of academicians have tried to focus on nature cycles which is much less

finite than the finite human cycle. The Gaia hypothesis of James Lovelock goes to this group of researchers who believe in the practices of do's and don'ts. The researchers of Green Peace Foundations and like minded groups have pegged themselves in this school. The researchers of this school are referred as 'Arcadians'. The libertarian extension and ecological ethics have been their forays.

The academic and functional researches have been on a continuum of anthropocentric on one extreme with the eco-centric of the other. But in-between during the 1960's appeared a new academic research zone, which referred to industrial cities and sites, urban areas, waste management, energy use, occupational health, environmental hazards at work and every day one more gets added. A formal name to this group of researchers is yet to be coined. But the approach of all the three have one thing in common they are mostly 'normative' and less experimental<sup>10</sup>.

Thus the appropriateness of the innovations that is namely typified as Environmental Innovation, Eco-Innovation, Sustainable Innovation and Social-Ecological Innovation<sup>11</sup> grow in eco-system of the following mandatories.

1. **The quality of the research**
2. **The ethics in its essence.**
3. **The ideology that the output furnishes and endorses.**

Here-in the researcher would admit that quality is largely the domain of the methodology and quality of the data input, nothing more need to be stated along these lines, since lot of the researcher are well toned and tuned to it, However the researcher adds a depth to this issue herein stating that the approaches to generating 'Quality of Research' are two. In other words the bench mark against which the quality of the research is judged, relates to either reliability and validity, or authenticity and trustworthiness. Each is measured according to different criteria. One suggests the researcher to follow any of the columns stated below:

1. Reliability and Validity	2. Authenticity and trustworthiness
Based on the realist or positivist paradigm. Criteria include reliability, internal validity, generalization, relevance, objectivity	Based on an interpretive paradigm. Criteria include authenticity, credibility, transferability, dependability, confirmability.

Strategies which enables one to ensure that such research is reliable and valid – or authentic and trustworthy-include a longitudinal research design, member checking, peer briefing, demonstrating an audit trail, providing thick descriptions, seeking out negative cases and alternative explanations and triangulations<sup>12</sup>. Now, whatever be the strategy the ethical dimensions in the objectivity or confirmability should be within the sight of the researcher.

### ***Ethics***

The three approaches are the following<sup>13</sup>.

1. **The libertarian extension-** The concept of individual rights is extended to all human non-human animals and possibly in inanimate entities. This means that all individual entities should be given the right to an uninterrupted freedom of existence. Some ecologists would extend the concept to include all ontological things (i.e., beings and objects that actually exists). The interpretation means that a being does not have to possess an intrinsic value (alternatively expressed as consciousness) to have an ethical value.

2. Ecological extension-Emphasis is not placed upon individual rights but upon interrelatedness of all entities in the geophysical structure of the planet and their essential diversity. This approach is referred to as 'eco-holism' and is exemplified in Gaia hypothesis proposed by James Lovelock.
3. Conservation ethics- In this approach, emphasis is placed on ecological conservation for the benefit of humankind. The environment has an instrumental value in which it is not seen as an end in itself, but a means of gaining pleasure and profit. This is most common form of moral reasoning over the environment and the most common dictate of environmental policy.

The ethics are implemented by the environmental/sustainable development advocates in various forums who are most of the time radical viewpoints. They are namely, 'deep ecology', 'social ecology', 'eco-socialist and 'eco-feminist'.

### **Political views**

The value of deep ecology emphasises on the intrinsic value of all life and acknowledges that all life is equal. In other words this group consider the view point that human beings are not the sole purpose of the evolutionary process but just another living species. The deep ecologists are therefore enthusiastic supporter of human control programmes in order to reduce destructive human pressures upon the earth. The politics of social ecologists are embedded in the anarchist traditions, with their associated hostility to the state, liberals and Marxist. They are advocates of maximum individual autonomy and the decentralisation of society into local communities as opposed to the concept of the nation-state. This group believes in the socially constructed hierarchical structure and the human beings exalted position

This is followed by the concept of eco-socialist, who attempt to integrate ecological principles with theories of socialism that are necessarily political. They are away from the anarchist and therefore blame inequity of wealth distribution in society as the problem leading to the sustainability. Though, eco-socialism is allied to Marxism, this group does not believe in Marx presumption of limitless abundance of nature. The difference between the social ecologist and eco-socialist is that the former believes in local community while the latter believes in nation-state<sup>14</sup>. The eco-feminist believes in the thought that sustainability problem that the world is facing has its genesis in patriarchy. According to them ecological destruction and the oppression of women are linked.

Political stress over sustainable development therefore underlines the path of research and its interpretations. The fundamental division is between those for whom sustainability represents little more than technology and environmental accounting system; whilst preserving the status quo of existing hierarchy and power structures in society, and those who have some more radical political agendas involving changing the value system and power structures of society.

### **Summary:**

The navigation bends entail first in understanding the area of research where in the innovation will be of utility to the state, society, consumers and other stakeholders within the state and outside the state.

This is so as sustainability is not a capsule of any nation state but of the earth. The researcher then mandatorily has to look into the quality of research with attention to the approach required fulfilling the ethical requirements and expectations of the user groups.



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**TRANSCUTANEOUS OXIMETRY AS THE CHOICE OF THE  
RESEARCH FOR DETERMINATION OF LEVEL OF AMPUTATION OF  
THE CRUS AT CRITICAL ISHEMIA OF THE LOWER EXTREMITIES  
AT PATIENTS WITH THE DIABETES MELLITUS**

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**ABSTRACT**

**Background:** The diabetes mellitus is an important medico-social problem pragmatically of all countries. In the Republic of Uzbekistan, as well as worldwide, high growth rates of incidence of DM are noted. According to the researchers conducted in 2014-2019 prevalence of a diabetes mellitus 2 types in Uzbekistan make 7,9% among persons aged 35 years are more senior. Patients with DM and CILE represent heavy group of patients with high risk of failures. Frequency of amputations remains high at persons with DM and now. One of the most worthy and methods of a research often now in use of a condition of the microcirculatory course is the transcutaneous oximetry. From the offered methods the transcutaneous oximetry shows to sufficient informational content for determination of optimum level of amputation. **Objective:** The results of treatment of 68 patients operated by the mixed infected forms of diabetic foot with critical ischemia of the lower extremities are subjected to the analysis. **Methods:** 19 examined patients amputated at the level of a crus, the line of border of amputation determined before operation on indicators the basal level of oxygen not less than 30 mm Hg. **Result:** Given to a transcutaneous oximetry (tpcO<sub>2</sub>) at these patients showed that in a zone of the expressed fabric hypoxia the sowing of high level of microflora is noted. **Conclusion:** The analysis of the received results of our research was shown that at severe forms of critical ischemia of the lower extremity modern method is amputation at the level of a crus by Mitish. The combination of operation of Mitish to application transcutaneous oximetry (tcpO<sub>2</sub>) before operation promotes will lower postoperative purulent complications of a stump.

**KEYWORDS:** *Diabetes Mellitus, Critical Ischemia Of The Lower Extremities, Amputation, Transcutaneous Oximetry.*

## INTRODUCTION

The diabetes mellitus is an important medico-social problem pragmatically of all countries. According to forecasts of the International diabetic federation (IDF), by 2030 increase in number of sick DM2 up to 552 million doubles and will come to the 7th place among causes of death [3,8,7]. In the Republic of Uzbekistan, as well as worldwide, high growth rates of incidence of DM are noted. According to the researches conducted in 2015-2016 prevalence of a diabetes mellitus 2 types in Uzbekistan make 7,9% among persons aged 35 years are more senior. Frequency of amputations of extremities at sick SD by 15 - 30 times exceeds this indicator in the general population and makes 50 - 70% of total quantity of all not traumatic amputations [2,4]. Atherosclerosis of vessels is the reason of an origin of HINK in 80-90% of cases. Especially often this pathology is observed at persons 60 years are more senior [1,5,14].

Patients with SD and CILE represent heavy group of patients with high risk of failures. According to Jude EB mortality at patients with SD and KINK makes 30% within 5 years [3,4,8].

Frequency of amputations remains high at persons with SD and now. According to Vamos, in Great Britain, from 2004 to 2008 a half from total number of not traumatic amputations is made at patients with SD [2, 6, and 13].

One of the most worthy and methods of a research often now in use of a condition of a microcirculator bed is the transcutan oximetry. Measurement of partial pressure of oxygen in the field of the back of foot, on a shin is valuable noninvasive easily feasible diagnostic method of ZPA at patients with diabetes [1,9,11].

According to literary data, it is normal of tcpO<sub>2</sub> on foot > 40 mm Hg (T. Rooke et.al. 1998). For more exact diagnosis of ischemia of an extremity when carrying out a transcutan oximetry, including, at patients with obliterating atherosclerosis, it is necessary to estimate, both the basal tcpO<sub>2</sub> level, and dynamics of changes when carrying out functional trials at patients with obliterating atherosclerosis of arteries of the lower extremities of more informative orthostatic test with lowering of a leg is considered (Schef fl er A. et al 1992).

Measurement of tcpO<sub>2</sub> to surgical intervention is one of informative diagnostic methods for implementation of dynamic observation. Now tcpO<sub>2</sub> is widely applied also to assessment of efficiency of the moved endovascular intervention on arteries of the lower extremities [6,12].

Advantages of a method of a transcutan oximetry at sick SD in comparison with measurement of LPI, PPI and segmented pressure consist in bigger informational content when screening ZPA, determining KINK, assessment of level of amputation of an extremity, the forecast of healing of ulcer defect and independence of weight of media calcification of peripheral arteries [4,10].

From the offered methods the transcutan oximetry shows to sufficient informational content for determination of optimum level of amputation, is not a difficult procedure and who can be used for broad use in routine clinical practice.

**Research objective**

Improvement of results of treatment of postoperative is purulent - necrotic complications, the amputated lower extremities at the level of a shin of patients with a diabetes mellitus at critical ischemia of the lower extremity in the way, uses of a transcutan oximetry for determination of optimum level of amputation.

**MATERIALS AND METHODS**

Results of treatment of 68 patients operated apropos by the mixed infected forms of diabetic foot with critical ishemiya of the lower extremities are subjected to the analysis.

All patients were heavy degree of SDS from critical ischemia of the lower extremities (Wagner III-IV-V). Amputation at the level of a shin was it is executed on the developed way of operation by the staff of the National research center of surgery of Vishnevsky in 1997 (V. A. Mitish).

The age of patients varied from 43 to 74 years which middle age made  $570,5 \pm \text{years}$ . Disease duration with critical ischemia from 4th to 18 years, the average duration of a disease is  $110,5 \pm \text{years}$ . The diabetic anamnesis revealed that among 68 patients 4(5,9% have a diabetes mellitus) is revealed for the first time. These patients learned about the disease only after receipt in our clinic concerning gangrene of the lower extremity, 46(67,6%) patients had 4 and over a year the diabetic anamnesis, the average duration of a disease made  $112,5 \pm \text{years}$ .

From the inspected 68 sick SDS from critical ischemia of the lower extremities at 19 patients measurement of partial pressure of oxygen by means of transcutan oximetry in the lower extremities in various points of a shin the presurgical period for determination of optimum level the line of border of amputation was carried out.

The Transcutan oximetry (tpcO<sub>2</sub>) was carried out by means of the device "Radiometer" (Denmark). Determination fabric saturation of oxygen allows to predict postoperative complications of a stump.

Studying of a functional condition of vessels was carried out by means of duplex scanning.

Besides, at all patients it is studied intoxication indicators: body temperature, LII of blood, SOE, average molecule of blood. In the course of treatment specialists participated: surgeon, endocrinologist, anesthesiologist and cardiologist.

**RESULTS OF A RESEARCH AND THEIR DISCUSSION**

All patients 68 are conditionally divided into 2 groups.

**1** group was made 49 (72,1%) sick with which it was not applied a transcutan oximetry when determining the line of border of amputation of the lower extremity at the level of a shin.

**2** group was made 19 (27,9%) sick with which the line of border of amputation on indicators the basal level of oxygen not less than 30 mm. carried out amputation of the lower extremities at the level of a shin after definition.

Given to a transcutan oximetry (tpcO<sub>2</sub>) at these patients showed that in a zone of the expressed fabric hypoxia and high level of microflora is noted.

The analysis of results of control group indicators of the general intoxication of an organism revealed the following;

In the first days of treatment the body temperature of patients averaged  $38,6 \pm 0,30^\circ\text{C}$ . The maintenance of leukocytes of blood was equal on average  $9,4 \pm 0,5 \cdot 10^9/\text{l}$ . The volume of average molecules averaged  $0,216 \pm 0,011$  pieces. Similar to it increase in indicators of LII and SOE to  $2,5 \pm 0,18$  and  $49,1 \pm 2,4$  respectively was noted. The increased level MCM, L, LII, and also SOE, indicated the expressed endointoxication at this category of patients.

On third day of treatment considerable decrease in these indicators of body temperature from  $38,6 \pm 0,30^\circ\text{C}$  to level  $36,7 \pm 0,40^\circ\text{C}$  was noted, the quantity of leukocytes of blood decreased, on average, to  $7,0 \pm 0,4 \cdot 10^9/\text{l}$ . Content of the MCM blood decreased to  $0,116 \pm 0,012$  pieces. Changes of indicators of LII by 3rd days of treatment also tended to decrease in from  $2,5 \pm 0,18$  to  $1,3 \pm 0,12$  pieces. At this SOE decreased, on average, to  $24,7 \pm 1,3 \cdot \text{mm/g}$ .

By seventh days of treatment at the inspected patients of control group got closer to norm ( $36,6 \pm 0,40^\circ\text{C}$ ). At the same time on organism intoxication indicators: L, MCM, LII and SOE of blood was noted their further decrease, that is there was a tendency towards normalization –  $6,2 \pm 0,3$ ,  $0,101 \pm 0,011$ ,  $1,1 \pm 0,2$ ,  $12,7 \pm 1,6$  respectively.

It should be noted that in the course of treatment at normalization of all other indicators of intoxication, SOE of blood tended to slow normalization. Studying of level of content of sugar in blood showed that by the time of receipt in clinic, on average, it made  $15,1 \pm 2,1 \text{ mmol/l}$ . Elimination it is purulent - the necrotic center and the intensive care which is carried out in the postoperative period promoted decrease in level of sugar in blood to figures of the upper bound of norm only by 14-20 days of treatment.

From 19 amputated lower extremities inspected sick at the level of a shin the line of border of amputation not less than 30 mm Hg determined by indicators the basal level of oxygen. In early the postoperative period of suppuration of a stump of a wound to this group of patients were not observed. At 2 (10,5%) patients it is noted complications in the form of a seroma.

As it was stated above amputation of the lower extremity at the level of a shin by which when determining the line of border of amputation, it was not applied a transcutan oximetry is executed from 68 inspected 49 patients of control group. The general state and indicators of laboratory analyses were synchronous.

From 49 inspected patients of control group at 5 (10,2%) suppurations of a stump of the wound amputated knees in early the postoperative period was observed. For examination the suppuration reason at these patients were carried out a transcutan oximetry in various points proximal of the fabric left upper 1/3 parts amputated shins. Results transcutan oximetry showed, all patients with a complication have suppurations of a stump, a proximal part from 2 to 5 cm an indicator of  $\text{tcpO}_2$  there were lower than 20 mm Hg that corresponds to III extent of disorders of microcirculation (dekompensirovanny fabric metabolism). This patient executed extremity reamputation at the level of a hip.

## CONCLUSION

Thus, the analysis of the received results of our research was shown that at severe forms of critical ischemia of the lower extremity use of a modern method of amputation at the level of a shin across Mitish allows preservation of a knee joint that promotes decrease in an invalidism, after an operational lethality and complications. However, this method up to the end does not solve a problem as after operational complications, stump suppuration at the same time makes up

to 10,2%. The combination of operation of Mitish using transcutan oximetry (tcpO<sub>2</sub>) before operation promotes will lower postoperative purulent complications of a stump.

Results of our research show about need of a transcutan oximetry when determining level of amputation of a shin at sick SDS from critical ischemia of the lower extremities and the oksimetriya demands to develop new methods of determination of optimum level of amputation even in the absence of a possibility of carrying out transcutan oximetry.

## SUMMARY

1. Amputation at the level of a shin across Mitish at DFS though is a modern method of treatment, but suppuration of a postoperative stump meets to 10,2%.
2. At purulent complications after amputation at the level of a shin at sick SDS from critical ischemia of the lower extremities key a role is played by a local hypoxia of fabric of a distal part of a stump.
3. SDS stump suppuration from critical ischemia of the lower extremities occurs at patients with indicators of a distal part of a stump trsO<sub>2</sub> lower than 20 mm Hg.
4. For prevention of purulent complications at the amputated patients at the level of SDS shin from critical ischemia of the lower extremities it is necessary to determine amputation level taking into account indicators tcpO<sub>2</sub> crus tissues.
5. It is necessary to develop new methods of determination of optimum level of amputation in the absence of a possibility of carrying out transcutan oximetry.

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## **FREQUENCY OF SPREAD OF A SHORT FRENUM OF THE TONGUE AND UPPER LIP IN PRESCHOOL**

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### **ABSTRACT**

*The problems of a short frenulum of the tongue and upper lip in children is multidisciplinary, affecting pediatrics, pediatric dentistry and speech therapy. A short frenulum of the tongue can cause a child's chronic trauma to periodontal tissues, functional impairment, and difficulty in sucking, swallowing, incorrect pronunciation of sounds. A short frenulum of the upper lip leads to an increase in the gap between the front teeth, the formation of diastema. With the timely detection and treatment of a short frenum of the tongue and upper lip, deformations of the upper and lower frontal teeth, pronunciation of sounds, problems of breastfeeding, swallowing, as well as risk factors for periodontal diseases are prevented. The above listed functional impairment of childhood makes it necessary to carry out preventive work in preschool institutions. Often, orthodontists, speech therapists, and general practitioners are sent to surgery to lengthen the short frenum of the tongue and upper lip. When collecting the history there were close relatives with the same pathology. With the timely detection and treatment of a short frenum of the tongue and upper lip, deformations of the anterior and lower frontal teeth, pronunciation of sounds, problems of breastfeeding, swallowing, as well as risk factors for periodontal diseases are prevented. During the formation of a permanent bite, a shortened frenulum of the upper lip leads to the advancement of the front teeth, especially if there is not enough space in the dentition [4.7.9]. Subsequently, it is difficult, long and expensive to correct such malocclusion. A short frenum of the tongue is more common in boys with a significant restriction of the mobility of the tongue, leading to development of an open bite.*

**KEYWORDS:** Short Frenulum, Tongue, Upper Lip, Anomaly, Frenulotomy, Prevention, Deformation, Risk Factors, Children.

## **INTRODUCTION**

A short frenulum of the tongue and upper lip in a child is a small congenital anomaly of the maxillofacial region [1.3]. A short frenulum of the tongue can cause a child's chronic trauma to periodontal tissues, functional impairment, and difficulty in sucking, swallowing, incorrect pronunciation of sounds. A short bridle of the upper lip is often conjunct into the interdental papilla, and sometimes into the incisal papilla, leading to an increase in the gap between the front teeth, the formation of a diastema [2.5].

In addition, a shortened bridle pulls the mucous membrane of the alveolar process of the upper jaw during the movements of the upper lip, as a result the gum moves away from the front incisors, afterwards there is hypersensitivity, exposure of the roots, periodontal disease, etc. During the formation of a permanent bite, a shortened frenulum of the upper lip leads to the advancement of the front teeth, especially if there is not enough space in the dentition [4.7.9]. Subsequently, it is difficult, long and expensive to correct such malocclusion. A short frenum of the tongue is more common in boys with a significant restriction of the mobility of the tongue, leading to development of an open bite.

With a short bridle of the upper lip, the main reason for patients to see a doctor is an aesthetic deficiency, the presence of diastema between the central incisors on the upper jaw. Clinically, in childhood, it is advisable to distinguish two types of short bridles of the upper lip [6.8].

The first type of bridle of the upper lip is thick, powerful, triangular in shape and short; its lower pole is woven into the incisal papilla, between the central incisors. When the upper lip is pulled back, the papilla turns pale or even shifts, exposing the neck of the teeth. In the thickness of the bridle, a dense connective tissue cord is fixed, fixed to the bone along the midline [8.10]. The mobility of the upper lip is slightly limited.

The second type of frenulum of the upper lip is short, thin, which is attached to the crest of the alveolar process between the central incisors. In this case, a diastema occurs, and sometimes inflammatory-dystrophic diseases in the periodontium.

**Objective:** To determine the frequency of prevalence of development of of the frenum anomalies of the tongue and upper lip.

**Tasks:** To examine 400-450 children of 5-6 years old in kindergartens in Bukhara, in order to identify a short frenum of the tongue and upper lip. Determine the number of children in need of surgical treatment.

## **MATERIALS AND METHODS:**

Inspection was carried out in kindergartens of Bukhara in 400 children age of 5-6. Inspection of children must be carried out in a calm environment with a balanced state of children.

The tongue was raised with an ordinary spatula, if there is a short bridle of one degree or another, then the movement of the tongue is limited, the forked tip of the tongue, when protruding, the tongue seems hunchbacked, its back is raised. With two index fingers of the right and left hand we raise the upper lip. The lip rises with difficulty, you can see the cord and diastema between the central incisors.

An examination revealed a short frenulum of the tongue in 15 children, including 9 boys and 6 girls. Short bridle of the upper lip according to type I-38, type II-18, of which 32 are boys, 24 are girls.

An operation of frenulotomy was performed in the Bukhara Regional Children's Dental Clinic No. 2. During the preparation for the operation, if there are not contraindications, we performed an operation to lengthen a short frenulum of the upper lip and tongue. Also took into account the anamnesis, age of the child, past illnesses, found out allergic reactions to drugs.

When lengthening a short frenum of the tongue, we used the usual method: under local anesthesia we performed a transverse dissection of the frenum at the border of the middle and upper third. Exfoliated tissue to the muscle layer, checked how much increased mobility of the tongue and sutured with catgut. To lengthen a short frenulum of the upper lip, phrenolotomy was performed - frenulum grafting with counter triangular flaps according to Limberg, a method which we consider to be the most effective. The postoperative course went smoothly, there were no complications, the sutures were removed on 8-9 days.

## CONCLUSION:

Often, orthodontists, speech therapists, and general practitioners are sent to surgery to lengthen the short frenum of the tongue and upper lip. When collecting the history there were close relatives with the same pathology. Conducted x-ray examinations with diastema, with the detection of abnormalities from the central incisors (retention, supernumerary tooth) in order to clarify the diagnosis and draw up a plan of surgical and orthodontic treatment. In addition to the clinical diagnosis, many children need an X-ray examination.

The problems of a short frenum of the tongue and upper lip in children is multidisciplinary, affecting pediatrics, pediatric dentistry and speech therapy. With the timely detection and treatment of a short frenum of the tongue and upper lip, deformations of the anterior and lower frontal teeth, pronunciation of sounds, problems of breastfeeding, swallowing, as well as risk factors for periodontal diseases are prevented.

The above listed functional impairment of childhood makes it necessary to carry out preventive work in kindergartens.

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## **ORTHOPEDIC DENTAL CARE FOR PATIENTS WITH TYPE 2 DIABETES, DEPENDING ON IMPAIRED RENAL FUNCTION (REVIEW ARTICLE)**

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### **ABSTRACT**

*However, an analysis of sources of domestic and foreign literature shows that the psychological status of patients with CKD, the degree of motivation for dental rehabilitation, the level of dental morbidity and its structure at the stages of treatment of the underlying disease have not been fully studied. Methodological approaches to the assessment of dental risk factors and algorithms for dental treatment of this category of patients have not been fully developed. The interdisciplinary approach is not perfect in conditions of combined pathology of the kidneys and oral cavity. Dental rehabilitation centers for patients with CKD do not function. Methodological approaches to the assessment of dental risk factors and algorithms for dental treatment of this category of patients have not been fully developed. The interdisciplinary approach is not perfect in conditions of combined pathology of the kidneys and oral cavity. Dental rehabilitation centers for patients with CKD do not function [15.17].*

**KEYWORDS:** *Diabetes Mellitus, Renal Failure, Orthopedic Dentist*

### **INTRODUCTION**

In the 21st century, the world community was faced with a global problem that has not only medical, but also great socio-economic significance - the pandemic of chronic diseases. A special place among them is chronic kidney disease (CKD) [1.3.6].

To date, according to official figures, in Russia, about 14 million people have this diagnosis [2.4]. From complications of CKD, tens of thousands of citizens of the Russian Federation die every year [5.7], and 41.5 thousand Russians of young and working age are recognized as disabled [1.8]. In this regard, in our country, successful treatment of this pathology is an important state task to preserve the health of the nation [9].

But CKD is not a highly specialized, "nephrological", but a general medical problem [10].



CKD patients are at risk of developing oral diseases [13]. Special literature data indicate that a low level of dental health contributes to the progression of systemic complications in nephrological patients [4]. Therefore, prior to kidney transplant surgery, they need to exclude existing risk factors - foci of odontogenic infection [8]. However, the lack of oral sanitation after surgery can lead to transplant rejection [12] and, in general, adversely affect the prognosis of treatment of kidney disease. Therefore, dental rehabilitation is also of great practical importance for patients with CKD [13].

However, an analysis of sources of domestic and foreign literature shows that the psychological status of patients with CKD, the degree of motivation for dental rehabilitation, the level of dental morbidity and its structure at the stages of treatment of the underlying disease have not been fully studied [14.16]. Methodological approaches to the assessment of dental risk factors and algorithms for dental treatment of this category of patients have not been fully developed. The interdisciplinary approach is not perfect in conditions of combined pathology of the kidneys and oral cavity. Dental rehabilitation centers for patients with CKD do not function [15.17].

The above aspects have determined the relevance of this study.

## RESEARCH METHODS

1. Clinical and hygienic.
2. Determination of bone density (X-ray densitometric method).
3. Laser Doppler flowmetry.
4. Determination of the level of secretory immunoglobulin A and saliva lysozyme.
5. Microbiological research methods.

## CONCLUSION

The data obtained as a result of scientific research will reduce the number of complications and failures when planning and performing prosthetics, and during the long-term functioning of prostheses in patients with diabetes mellitus, depending on impaired renal function, and also contribute to the improvement of dental care and social adaptation of patients with diabetes mellitus depending on impaired renal function and improving their quality of life.

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## **SELECTION AND GENETIC METHODS FOR THE CONSERVATION AND RESTORATION OF THE KARAKUL SHEEP GENE FUND**

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### **ABSTRACT**

*The article presents analytical resources for the conservation of the gene pool of domestic animals of different breeds around the world. Biological and productive potential of Karakul sheep, problems and methods of conservation, restoration of the gene pool of sheep in our country. Selection - genetic methods for the conservation and restoration of the gene pool of the Karakul sheep of Surkhandarya sura have been developed. Therefore, the gene pool of all species of plants and animals has the ability to choose the climatic conditions of the environment. Therefore, Karakul sheep, a native of Uzbekistan, is adapted to year-round hills and pastures in desert, semi-deserts and arid steppes, mountains and foothills, depending on environmental conditions of the country. However, in Uzbekistan, there has been little research in the Central Asian countries on the conservation of the gene pool of karakul sheep. This research work is significant because it is the first time in Uzbekistan that the development of selection and genetic methods for the preservation of the gene pool of karakul sheep breeds. Although the conservation and restoration of the Surkhandarya Surgery sheep gene pool is widely used for homogenous (inbreeding) techniques, the development of kin lines and line crosses is important in increasing the gene pool, but failing to reinforce the gene pool. Therefore, it is desirable to have 2-3 gene lines in the flock. To carry out the experiment and control of selection, selection, selection, artificial insemination and evaluation of lambs of elite class breeds and sheep at Bobatog-suri Karakulchilik LLC of Kumkurgan district.*

**KEYWORDS:** Resource, System, Information Content, Somatics, Cell, Veterinary Medicine, Category, Argument, Soil Degradation, Gene Pool, Selection and Genetic, Genebank.

## INTRODUCTION.

The relevance of the topic. According to the FAO, there are 8774 domestic species of 38 species, 7718 of which are domestic and 1056 are transboundary. [8]. However, over the past ten years, they have been reduced by 15-17% and some species and offspring have been extinct, with 38% of the population safe and 20% at risk [2.6.9]. In addition, it is reported that around 50 different species of animals are lost in the world every day, with about 2 domestic animals per week [6.9.10].

The above analytical specimens are also observed in world sheep. In particular, there are 1,229 sheep breeds in the world, the number of which is reduced by 14-16%. The total number of sheep is 1.25 billion. including sheep of sheep breed is the head. [7.9].

One of the global problems in the world today is the preservation of the gene pool of all living organisms, including plants and animals. Currently, there are plant genbanks in over 140 countries, the largest of which is the Arctic Spitsbergene genbank, internationally. [4.6].

The important point is that while the genetic resources of genbank are relatively easy to maintain, the genetic resources of the fauna of various biological forms remain extremely complex.

Like all other living things in the wild today, agriculture (plant) and livestock (pets) are an important source of food security. Today, the gene pool of plants and livestock that forms the backbone of this network is decreasing every year.

It is known that soil degradation has a significant impact on plant species and gene pools. Because all living things, including plants and animals, are products of nature and soil, they grow, develop (ontogeny), multiply, nourish, and live in harmony with the general environmental climatic conditions of a given geographic area. [6].

Therefore, the gene pool of all species of plants and animals has the ability to choose the climatic conditions of the environment. Therefore, Karakul sheep, a native of Uzbekistan, is adapted to year-round hills and pastures in desert, semi-deserts and arid steppes, mountains and foothills, depending on environmental conditions of the country. Basically, this breed is based on its biological characteristics to steppe conditions, mountain pastures.

Karakul sheep provide not only meat to the food industry, but also skins of ferrous, blue, black, white, and other colorful and colorful foods that are priced at the international fur auction market.

Karakul sheep breeds are well-known in the world for the supply of popular karakul leather. Basically this breed is well adapted to the climatic conditions of the steppe region of Central Asia and Kazakhstan. Currently, sheep breeding is being carried out in about 50 countries. The best developed countries are Karakalpakstan, Uzbekistan, Afghanistan, South Africa (Namibia, South Africa, etc.), Kazakhstan, Iran, Turkmenistan and others.

Karakul sheep breeding is well developed in Uzbekistan and is replicated in the Republic of Karakalpakstan, Bukhara, Navoi, Kashkadarya, Samarkand, Jizzakh and Surkhandarya regions. The number of Karakul sheep breeding in the country is 6.0 million.

In recent years, changes in the economy of karakul sheep breeding, weather climatic conditions, drought, declines in pasture and crop yields, mechanization and more have led to a decrease in the gene pool of sheep and sheep productivity.

According to the analysis of breeding scientists of the Karakul Research Institute of Karakul and Desert Ecology, 25% of 31 high-yielding breeds of plant breeds created by long-term breeding and

breeding work have been completely lost; It is reported that some rare and unusual color variants (or 16.1%) of black species of "Serpusht", blue "Tomdi" and "Nurota" and Surkhandarya Sur are reported to be missing (or 16.1%).

Uzbekistan mainly produces Karakul sheep breeds of Karakalpakstan, Bukhara and Surkhandarya regions.

Surkhandarya Surkhandarya is produced after the Karakalpak and Bukhara lambs, however, it produces the most valuable, rare and antique color skins. This species of karakul sheep in the Kumkurgan district (former Yu.Gagarin) is now home to the Bobotog sur Karakakul LLC, a breeder and scientist based on the theory of continuity of variation. 5.].

To date, the quality of sheep skins of Surkhandarya sheep karakul sheep is significantly reduced and does not meet international market requirements. The number of high-productive breeding sheep has been significantly reduced among the sheep-breeding karakul sheep breeding on the farm.

From the foregoing, we are scientists from the Karakul Research Institute of Deserts and Desert Ecology and Termez State University to create a gene pool for Surkhandarya Surin sheep, to increase their productivity, to improve the quality of the sheep breed and increase the number of high-yielding sheep. We carried out research work at the "Bobotog-suri Karakulchilik" LLC of Kumkurgan district.

Our research work The project code and name: KXA-8-059-2015 "Development of selective genetic methods for the conservation of the karakul sheep breed of Surkhandarya Surkhandarya", approved by the Agricultural Research and Production Center of Karakul and Desert Ecology of the Republic of Uzbekistan on March 10, 2015. The topic of the conference was the implementation of research activities for the period of 2015-2017.

It is well-known that the main focus of breeding work with livestock should be focused on improving the breeding and productivity characteristics.

In the field of karakul sheep breeding scientists have studied biological characteristics of Karakul sheep, productivity, constitution, physiological features and others. Aripov, R.G. Valiev, S.Yu. Yusupov, M.Sh.Ismailov, N.A. Boboqulov, A. Gaziev, E.A. Ata-Kurbanov, AM Ombaev, Kazakhstan. Parjanov, M. Tuekbasov AA in Tajikistan Aliyev, Russia OG Smirnov, D.A. Babarykin, V.I. Georgievsky, S.G. Research work by Kuznetsov et al. [3]

However, in Uzbekistan, there has been little research in the Central Asian countries on the conservation of the gene pool of karakul sheep. This research work is significant because it is the first time in Uzbekistan that the development of selection and genetic methods for the preservation of the gene pool of karakul sheep breeds.

It is known that there are many factors influencing the reproduction of animals: breeding, selection and selection, physiological status, feeding and storage, storage conditions, genetic potential, and so on.

From this point of view, the selection of desirable lambs using biological methods of breeding, biological and morphological features, pigmentation of the skins of lambs with the use of homogeneous pairing techniques for conservation of the gene pool of the Surkhandarya flora of Karakul sheep. systematization of lamb valuation based on the intensity of the lambs.

The research work was studied in three series of practical processes and the results were analyzed.

In the first series of experiments, sheep were selected, and a comprehensive evaluation of their productivity was performed (skin type, color, color, silk and shine, etc.).

In the second series of experiments, the morphological and biological parameters of the sheep were studied and the results analyzed. It also shows the level of enzymes in the body of the Surkhandarya flora of karakul breeds (enzyme involvement in metabolism), histo-morphological features of the skin (skin and wool coating), cytogenetics of chromosomes.

The third series - systematic breeding and genetic work on the basis of world zootechnical education with the aim of increasing the unique economic characteristics and productivity of the Karakul sheep breed of Surkhandarya.

### **Purpose of the research:**

Development and introduction of selection and genetic methods for the conservation of the gene pool of the Surkhandarya flora of the Karakul sheep breed: a line of well-known breeds of high-yielding and endemic species of sheep and goats. selection of rams and efficient use of homogenous selection methods.

### **Expected result:**

Homogeneous selection of Surkhandarya ruminous karakul sheep breed, preserving the gene pool of the lost and depleted sheep, improving the unique and unique biodiversity, increasing productivity and breeding, and collecting sheep that meet the standard requirements. to form.

### **Research objectives:**

To carry out the experiment and control of selection, selection, selection, artificial insemination and evaluation of lambs of elite class breeds and sheep at Bobatog-suri Karakulchilik LLC of Kumkurgan district.

Re-evaluation of high-grade assessed offspring of different species during the lamb separation season, including small breeding collection flocks.

Ensuring the maintenance of all regulatory documents, analysis of observations with the participation of specialists and shepherds of "Bobotog-sur Karakul" LLC, development of selection and genetic methods for conservation and reproduction of Surkhandarya Surgul sheep breed, results and effectiveness of research. Develop and implement a practical recommendation.

### **RESEARCH METHODS:**

selection, genetic, biochemical tests. One of the most pressing problems of today is the conservation and reproduction of rare animal genetic resources.

### **The results of the study:**

N.G Giginayshvili illustrates the pattern of parent pairs in the way of homogenous pairing, sometimes in platinum surgeries (platinum sur and amber), or in other colors (bronze and platinum). color, caused by compression of other ornaments, genotype is unstable, long-term homogeneous mating herd on Surkhandarya breed pattern, and heritability of each pattern. increase the coefficient. [3.5].

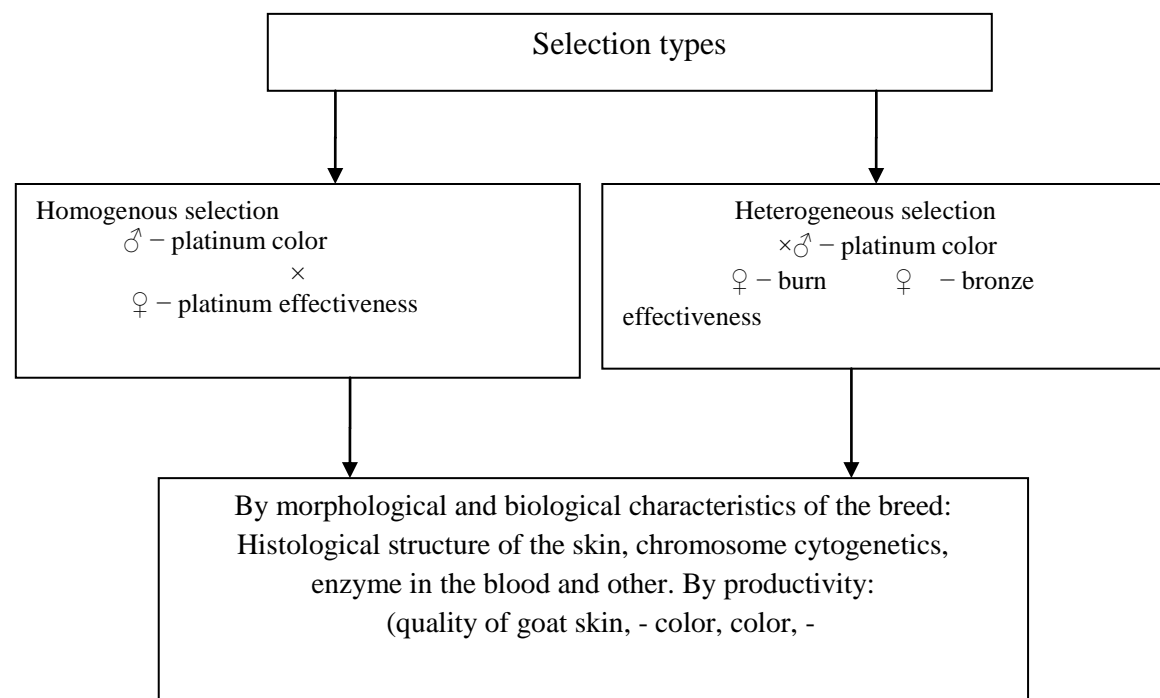
According to V.M Yudin and M.I. Kotov, the first flock of sheep was only 2.7%. 34.6% were selected when they were selected by heterogeneous black mammals (F1, F2, F3) by their origin, and 68.5% of the lambs were obtained when paired with heterogeneous surplus pigs (F1, F2, F3). Due



to the long-term selection process, that is, 98.8% of lambs were harvested during the selection of homozygous sheep. [3.5].

Our research work was based on the following structure: (Scheme 1). The structure provides the use of homogeneous pairing of sheep karakul sheep to restore the pattern of parent breeding, that is, to restore the unique and valuable diversity of hereditary herds.

### The structure of Surkhandarya breeding of sheep karakul sheep



The results of the assessment and evaluation of lambs of sheep and goats from sheep and goats showed that the heterogeneous pairing of the sheep karakul sheep was able to generate new patterns, preserve valuable genetic diversity through homogenous selection, and strengthen the heritability of animals. 2015-2019 According to the study.

(Table 1).

**TABLE 1. BIRTH OF VARIOUS SPECIES BY HOMOGENOUS SORTING%**

Colorful make up	Heads quantity	The color of the lambs of the lambs, %				
		Platinum	Yantar	Bronze	Anthocytes	Other
Platinum x Platinum	132	71,6	7,9	7,5	-	3,0
Yantar x yantar	112	9,1	68,5	-	12,4	0,3
Bronze x Bronze	110	10,9	3,7	71,5	-	2,6
Anthocytes x anthocytes	96	-	3,6	-	92,1	4,3

As shown in the table, sheep with platinum color variation are 71.6%, other colored 28.4%; The burn was 3.7%. When we saw similar indicators for homogenous homogeneity, the highest result was 65.5%. Homogenous selection of atrocytic lambs was highest at 92.1% of all species.

Consequently, the color of the sheep genotype created gradually increased and strengthened. Wide use of homogenous (inbreeding) mating methods is important for the growth of gene pools in the Surkhandarya Surgery.

In our study, we found that the color of the skin types in the lambs obtained from the selection of the Surkhan-Darya karakul sheep breeds is diverse. According to these indicators, the diversity of the Karakul sheep of Surkhandarya Sura is directly herded. The results of the study show that the lambs of each color are characterized by their specific skin types (Table 2).

Colorful	Counted heads	Skin flower types			
		Half circle pencil flower	Floral pencil flower	Flat pen	All kinds of flowers
Platinum	20	67,3±4,1	4,5±0,9	12,7±2,6	15,5±2,7
Yantar	20	65,9±3,2	6,2±1,2	15,5±3,0	12,4±2,5
Bronze	20	61,3±2,7	11,3±2,0	18,7±3,4	8,7±1,9
Anthocytes	20	46,9±1,5	6,1±1,1	31,8±4,3	15,2±2,7

The table shows that the most expensive skin type jacket is higher in all colors (platinum, yacht, bronze and anthocytes) than other skin types, including platinum, which is 67.3% and Caucasian 15.5%. The bronze color of the jacket was 61.3%, the Caucasian leather 8.7%, the Anthracite jacket skin type 46.9%, the Plosky 31.8%, or the platinum 19.1%, the burner and bronze. In lambs of different colors, the florets (plosky) are almost identical to those of other species.

In the Surkhandarya Surgery, the class of skins was studied in different colors, in addition to the silk and shine of the flowers with lamb skin. Table 3.

**TABLE 3 LEATHER CLASSES OF KARAKUL LAMBS OF SURKHANDARYA SURGERY, % (MM).**

Colorful	Counted head	Elite	I-class	II-class	III-class
Platinum	20	14,5±1,3	51,8±3,8	28,1±2,1	5,6±0,8
Yantar	20	10,9±1,1	49,6±3,6	31,0±2,3	8,5±1,0
Bronze	20	16,2±1,7	47,5±2,9	32,5±2,5	3,8±0,6
Anthracite	20	9,1±0,8	49,3±1,8	37,8±2,1	9,2±1,3

According to the figures presented in the table (Table 3), lambs of the elite and Grade 1 are predominantly platinum-66.3%, with 60.5% of lambs in sideways, with 63.7% in bronze. in anthracite - 58.4%.

The skin class of the Surkhandarya-based karakul lambs shows that high-grade lambs are predominantly platinum and greenish, due to the shiny and silky skin of the flower. That is, owing to the fact that the color of the lambs in the platinum and lush skins, the color of the flowers and the silky silk are superior to that of the other, it has been found that the lambs of the same color are more numerous.

The economic efficiency of our research work at Bobotog-suri Karakulchilik LLC of Kumkurgan district has improved the color and variety of lambs for breeding lambs by 25-30%, and the

quality of sheep skins delivered to the state has increased by 30-35% compared to previous years. . The profitability of the farm was up to 45%. The productivity of the Surkhandarya breed sheep and goats has improved.

Based on the results of our research and analysis, the current status of karakul sheep in Uzbekistan, given the state of genetic resources (genetic fund), is aimed at preserving the gene pool of karakul sheep, increasing the gene pool of high productivity sheep. We recommend:

- The genetic fund of Karakul sheep breeds should be protected by the state in this regard;
- Development of legislative and normative acts, a system of administrative and financial mechanisms for the effective use and rational use of animal genetic resources;
- Creation of a program for conservation and sustainable use of animal resources for the implementation of agreed state policies to address this problem;
- For the purpose of the program - it is desirable to systematically organize the selection, breeding and breeding activities for the efficient use, conservation and conservation of all kinds of agricultural animals including the genus of Karakul sheep.

Due to the need to do the following:

- taking comprehensive measures to strengthen state control over the conservation, development and use of gene pools;

Strengthen government support for the preservation, development and use of valuable gene pool and increase its effectiveness in the measures taken;

- improvement of legislation in the field of preservation, development and use of gene pools. Enables the implementation of the program;
- Creation of a system of state support and control over the conservation and use of valuable gene pools;
- Creation of breeding and genetic centers for livestock;
- Creation of animal gene pool repositories;
- creation of a database on the gene pool of animals in farms, farms, and flocks where the animals are raised, including Karakul sheep breeds.

Based on the results of the study, Bobotog-suri Karakulchilik LLC of Kumkurgan district has been reorganized into a saiga breeding farm, and the Baysun district Karakul sheep breeding farm has been reorganized to maintain and restore the gene pool. pastures (farm, sheep-collector) were established.

Although the conservation and restoration of the Surkhandarya Surgery sheep gene pool is widely used for homogenous (inbreeding) techniques, the development of kin lines and line crosses is important in increasing the gene pool, but failing to reinforce the gene pool. Therefore, it is desirable to have 2-3 gene lines in the flock.

One of the most important modern ways of preserving the valuable genetic diversity of the Surakul sheep is the creation of gene pool repositories. The DUUAR is to achieve cellular organism-embryonic recovery by storing seeds, eggs, gametes, and zygotes in the long-term frozen.

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## **ENVIRONMENT VS GROWTH**

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### **ABSTRACT:**

*The space inhabited by ecosystems to dwell, survive and thrive, put together is called their respective environment. Environment is typically the place around us, where we dwell in order to make a living and get ourselves adapted to the surroundings and their variations. Whether we live in a good or a bad environment totally depends on us, as it's in our hands to keep our surroundings clean and hygienic. Living systems in habit environments around them and become natural reasons for them to grow and develop beyond boundaries. When this limit is unreasonably crossed by man-made effects of globalised industrialization cum rapid urbanization factors, the environment slowly becomes a prey in the hands of human exploitation.*

**KEYWORDS:** *Industrialization, Unreasonably, Urbanization Factors*

### **INTRODUCTION:**

The last four to five decades have seen the world changing rapidly in terms of economic growth, expansion of urban landscapes, industries churning out more global prospects etc. The pace at which our modern ways of living have impacted the environment is unaccounted for. Serious damages to the environment have resulted on account of this unchecked human behavior causing changes in global climate, temperature and mass destruction of species.

Ever wondered why rainfall is becoming so unseasonal and even if it's in the right season, it may either be scanty or a flood causing trigger, such scenes becoming more common these days. Shortage of drinking water is a global crisis today. The depletion of ground water has reached unimaginable levels and the supply of fresh and natural air itself is going to become scarce some day in the future. The prospects of growth have multiplied in countless folds on a global scale, ignoring the environment around us, thus creating a big gap between human economic growth and environmental degradation.

**Adverse effects of growth on the environment:**

When man sought expansion of his industries and establishments, he did not fetch even a second glance at the environment. Today with the increase in high rise buildings, our cities have turned into what we call as concrete jungles. This has led to various at-sight problems for citizens. Drinking water facilities are poor and food adulteration is at an all-time high.

Sparrows were a common sight in front of every house a while ago, but now they have almost disappeared from everywhere. This is due to all spaces taken over by concrete structures and high intensity mobile radiations. So, we easily lost a species for our irresponsible growth intentions. This is a very good example of our growth having an impact on the environment. Not just this, if we see the many trees being uprooted in forests, forest fires creating havoc and taking away entire forest ranges in their fumes, we can very easily predict the extent of damage that would be created on the environment in coming years. Soil getting depleted of its vital nutrients has badly affected crop rotation cycles.

This has in turn caused soil to become infertile to an extent that vast lands on earth are becoming barren day by day. This has caused crop failures and inflation rates of essential vegetables to steeply rise. On the other hand, the excessive use of chloro fluoro carbons have created gaping holes in the ozone layer due to which harmful UV radiation are penetrating the earth's surface more than ever. Also, the depletion of ozone layer has created more deadly chemical reactions leading to incurable cancers etc. on earth.

Greenhouse gases responsible to create a sustainable environment on earth are turning into poisonous gases, capable enough of wiping out lives of millions. This has do far weakened the ancient symbiotic relationship between society and the environment on earth. On account of development and population growth, the environment is seeing mass destruction that cannot be set right at least in the years to come.

**25 YEARS OF REFORM:**

In his 1991 budget speech, finance minister Manmohan Singh made an emphatic declaration: "We cannot deforest our way to prosperity and we cannot pollute our way to prosperity". These were prescient words. While India had strong environmental legislation even in the pre-1991 era – the Wildlife (Protection) Act of 1972, Water Act of 1974, Forest (Conservation) Act of 1980, Air Act of 1981, and the Environment (Protection) Act of 1986 – this 'Environment vs. Growth' debate has become much more salient in post-reform India.

So what has changed since 1991?

First, problems, and therefore the environmental issues, have become mainstream. As the pressure on the environment increased with development, environmentalism has moved from being an 'elite' issue discussed in seminars and conferences, to becoming a real issue affecting people's daily lives, health and livelihoods. Witness the water table declines and extended droughts in Vidarbha and Bundelkhand. Or water logging in the Malwa region of Punjab which has affected the livelihoods of more than 2 lakh farmers. Or the pollution caused by unbridled mining and thermal power generation using poor quality coal in Chandrapur in Maharashtra that causes 10,000 people to fall sick of respiratory conditions every year.



Or the pollution of the Ganga, where the effluent and sewage treatment capacity cannot treat even half the pollutants pumped into the river every day. Even the elites are now affected directly – witness the uproar on Delhi's air pollution last winter, or the recent fire in the Deonar dumping ground in India's maximum city. Everywhere, the human impact of environmental pollution is surfacing very starkly.

Second, organized environmental advocacy has taken off. On the global stage, the Rio Convention (1992), the Kyoto Protocol (1997), and the subsequent ritual of annual climate change summits culminating in the Paris Agreement (2015) have meant that environment has obtained a prominent global profile. In India, NGOs have effectively used Public Interest Litigation (PILs) and Right to Information (RTI) as instruments of galvanizing action. The result is that no self-respecting government can today be seen to be soft or insensitive, at least in rhetoric, on environmental issues.

Third, judicial activism has taken root. In a little known but landmark move, the Supreme Court in 2002 set up a quasi-judicial body called the "Central Empowered Committee" (CEC) to "monitor the implementation of the Hon'ble Court's orders and place reports of non-compliance before the Court" related to forestry issues, giving the committee sweeping powers. Working quietly and efficiently, CEC has functioned as an active watchdog on forestry related issues ever since. More vividly in popular perception, it was judicial action that forced the government to move the entire fleet of buses in Delhi to CNG in 2001. A number of ad hoc interventions by the court eventually culminated in the establishment of a National Green Tribunal in 2011, as a professional empowered judicial body to adjudicate on environment and forestry related cases.

Given these developments, the new buzzword is "balancing" growth with environmental protection. This is a welcome change in vocabulary. But have we figured out the right mechanisms that strike such a balance? Not yet: from the Sardar Sarovar Dam, to the Jaitapur Nuclear Power Plant, to the polluting tanneries of Kanpur, environmental issues remain highly contested. More than 1,600 cases have come before the National Green Tribunal in the last few years, and that is just the tip of the iceberg.

Having seen some of these contestations closely in the last decade, I believe that environmental conservation and economic development are not an 'either-or' choice; solutions that strike a balance are indeed possible. The need of the hour is to think creatively.

First, we need to have 'smarter' regulation that leverages technology and markets. Environmental laws should not become the post-reform equivalent of the license-quota-inspector raj. Technology-based tools and market approaches can make for better regulation. A great example was the Emissions Trading Scheme, conceived by the Ministry of Environment & Forests and Abdul Latif Jameel Poverty Action Lab (J-PAL) in 2011, where real-time emissions monitoring and trading (modeled on the famous 'Acid Rain' program of the US) was launched in select industrial clusters. More such innovative approaches to pollution monitoring need to be mainstreamed.

Second, we need to revamp our outdated regulatory tools. India's current Environmental Impact Assessment (EIA) process is broken. The project proponent chooses (and pays) consultants who conduct the assessment, mandatory public consultations are rarely held with integrity, and environmental damage is seldom quantified rigorously. EIAs need to be done by independent accredited professionals, and need to follow more robust methods that quantify the economic benefits and the environmental costs, surfacing trade-offs and outlining mitigation measures.

Lastly, we need to look at serious institutional strengthening. It is high time India has an independent, professional environmental regulator. A detailed blueprint for such an entity – a National Environmental Appraisal and Monitoring Authority (NEAMA) – was put together in 2011. NEAMA was to be a permanent professional body, with adequate teeth and specialist expertise to appraise projects and monitor compliance. Last year, the Supreme Court stepped in and asked the government to constitute such an authority; however, there has been little progress since.

1991 reforms were the result of an economic crisis. Pushed to the wall, the establishment took notice and found an innovative path that unleashed India's economic destiny. India today faces an environmental crisis. It is time for us to once again take notice, and chart an innovative path for the sake of India's ecological destiny.

### CONCLUSION:

Ecological considerations are the need of the hour so that they do not hamper development in the name of modernization of society. Extensive protection of ecology and environment is essential for sustained economic development. Only if the environment around us is sustainable and friendly can we thrive and make our goals achievable.

It is a false perception that economic growth can lead independently of environmental considerations. We have to live and thrive within our boundaries and not forge ahead leaving out environmental considerations. The environment around us is like the lifeline that helped man grow into leaps and bounds and reach his goals, if we don't set right the imbalance created, the environment around us will never be restored ever again.

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## **ON THE PENETRATION OF ZENCOR HERBICIDE INTO PLANTS AND ITS EFFECT ON FOOD QUALITY**

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### **ABSTRACT**

*Constantly increasing the assortment and quantity of applied pesticides, expanding the scope of their use in various areas of the national economy, leads to an increase in the possible ways of getting them into food. Pesticides can enter plants with streams of atmospheric air, with sediments penetrating in one way or another into plants, chemicals are transformed by ascending and descending fluid flows, are deposited in different amounts in tissues, affecting the physicochemical properties of protoplasm. Furrow irrigation. When studying the chemical composition, it was found that when applying Zencor from the calculation of 0.5-2.0 kg / ha, the content of dry matter, total protein and starch in tubers did not differ much from the control. Thus, the use of Zenkor for tillage on potato plantings was accompanied by changes in some indicators of its chemical composition. The direction and severity of the change in the chemical composition depended more on the consumption rates and the growing season, while the type of irrigation was also reflected to a large extent on the level of residues. When applying the herbicide at the rate of 1.0 kg / ha, there was a tendency to increase the cobalt content by 16.3%. With an increase in the consumption rate to 2.0 kg / ha, a tendency toward a decrease in the level of cobalt in potatoes was revealed (25.4%  $p > 0.05$ ). Zenkor herbicide accumulates in the edible organs of cultivated plants and can affect the metabolic processes in crops, and therefore the chemical composition and nutritional value of the resulting food. Stability (persistence), the nature of the processes of migration and translocation of the drug depends on the conditions of irrigation, soil type, consumption rates, type and time of cultivation of crops (spring, summer crops).*

**KEYWORDS:** Penetration, Zencor Herbicide, Plants, Effect, Food Quality

## INTRODUCTION

Pesticides can enter food by directly processing plants, soil, food crop seeds, and contaminated water and air.

From the point of view of possible food contamination by pesticides, the soil is a great danger.

Lichtenstein E.R. (1989) while studying carrots grown on soils cultivated 2 years before sowing with lindane, he found the largest residues (6 mg / kg) in the root crop.

Pesticides can enter plants with streams of atmospheric air, with sediments penetrating in one way or another into plants, chemicals are transformed by ascending and descending fluid flows, are deposited in different amounts in tissues, affecting the physicochemical properties of protoplasm [2]. Some pesticides, penetrating plants from the soil, can cause an increase in the sucrose content in leaves [4,5,6].

*Atrazine pesticide has similar properties [9].*

And V.Khotyanovich and co-authors (2001) and R.G. Zharkova and co-authors (2000) observed a violation of protein metabolism under the influence of 2.4 D.

Authors Mead and Coon (1996) found a significant increase in soy sugar under the influence of pesticide-chlorine-IFC.

According to Bera (1997), the processing of thiophos salad is accompanied by a decrease in carbohydrates, protein and vitamin C. Based on the above, hygienic regulation of the conditions for the use of pesticides is the main link for the purpose of preventive measures aimed at protecting public health. In this regard, the assessment of food quality in the production process of which pesticides were used is an important and responsible task. The reliability of the developed regulations depends on how it is solved.

### **The purpose of the study**

we were tasked with studying the effect of Zenkor herbicide on a number of indicators characterizing the nutritional value of potatoes, expressed in conditions of furrow and sprinkling irrigation.

## MATERIALS AND RESEARCH METHODS

Zenkor is produced by Bayer (Germany) as a 70% wettable powder. Designed to control weeds in crops of potatoes, tomatoes and watermelons.

Experimental studies of the effect of the herbicide on the quality of food products of plant origin were carried out in the field.

The study of the influence of Zenkor on the quality of potato tubers was carried out during two growing seasons (spring, summer).

Spring planting: Zencor was introduced into the soil 15 days after planting potatoes at the rate of 0.5, 1.0, 2.0 kg / ha for the active substance. Field tests of the drug were carried out under conditions of furrow and sprinkling irrigation. Samples of the product for analysis were taken during the period of commodity maturity. At the same time, it was found that for all applications of Zenkor, the organo-peptic qualities of tubers did not differ from the control.

Furrow irrigation. When studying the chemical composition, it was found that when applying Zencor from the calculation of 0.5-2.0 kg / ha, the content of dry matter, total protein and starch in tubers did not differ much from the control. At the same time, when using the drug in quantities of 1.0 and 2.0 kg / ha, an increase in the content of vitamin C in potatoes was noted by 5.2 and 4.9%, respectively ( $P < 0.05$ ).

The use of a herbicide at the rate of 1.0 kg / ha led to a slight increase in the level of vitamin P in tubers (3.7%), and an increase in the consumption rate to 2.0 kg / ha, on the contrary, contributed to a decrease in this component in potatoes by 3.3%.

When introducing Zenkor at a consumption rate of 0.5-2.0 kg / ha, a tendency was revealed to increase the amount of copper by 14.6-29.1%, decrease the cobalt content by 7.5-32.9% and molybdenum by 10, 0-15.0% ( $p > 0.05$ ).

For all Zenkora consumption rates, the iron content in potato tubers was higher compared to the control (50.5-74.2%,  $p < 0.05$ ).

The residual amount of Zencor in tubers after 110 days was  $0.08 \pm 0.01$ - $0.23 \pm 0.03$  mg / kg, which does not exceed the permissible level (permissible ... 0.25 mg / kg).

Sprinkler irrigation. When applying Zencor at the rate of 0.5-2.0 kg / ha, the content of dry matter, total protein, starch, vitamin C, P in tubers did not change significantly ( $p > 0.05$ ). The introduction of 0.5-2.0 kg / ha into the soil contributed to an increase in the amount of copper in tubers by 45.5-63.8% ( $p < 0.05$ ). When applying the herbicide at the rate of 1.0 kg / ha, there was a tendency to increase the cobalt content by 16.3%. With an increase in the consumption rate to 2.0 kg / ha, a tendency toward a decrease in the level of cobalt in potatoes was revealed (25.4%  $p > 0.05$ ).

For all Zenko consumption rates, there was a significant increase in the amount of iron in tubers (89.6-102.1%,  $p < 0.05$ ). Residual Zenko amounts in potato tubers after 110 days at consumption rates of 0.5-1.0 kg / hectares did not exceed permissible ( $0.11 \pm 0.03$ - $0.18 \pm 0.04$  mg / kg), and with a higher consumption rate of -2.0 kg / ha, its residues were found at the level of  $0.31 \pm 0.04$  mg / kg, which exceeds the permissible concentration by 24%.

Summer landing. When applying Zenkor for summer planting of potatoes at the rate of 0.5, 1.0, 2.0 kg / ha, the organoleptic qualities of tubers did not change.

Furrow irrigation. When using the drug at the rate of 0.5-1.0 kg / ha, the dry matter content in potato tubers remained the same as in the control ( $p > 0.05$ ). With an increase in the Zenkora consumption rate to 2.0 kg / ha, its amount decreased slightly (3.7%).

In all potato samples, the total protein content decreased by 7.2-17.8%. When using the drug in norms, the consumption of 0.5-1.0 kg / ha, the content of vitamin C in the tubers did not naturally change. With an increase in its amount to 2.0 kg / ha, the level of this vitamin decreased by 32.1% ( $p < 0.05$ ). Zenkor soil cultivation in the amount of 1.0 kg / ha contributed to a certain increase in the level of vitamin P (3.4%), and at the maximum consumption rate, its content in tubers, on the contrary, decreased (by 3.5%).

When introducing Zenkor for planting potatoes, an increase in the level of copper in potatoes by 11.3-28.7% was revealed.



An increase in the amount of cobalt in the tubers was noted at a consumption rate of 1.0 kg / ha (67.6%  $p < 0.05$ ). In addition, at the same rate of drug consumption, an increase in iron accumulation by 50.6% was observed ( $p < 0.05$ ).

The residual amount of Zenkor in potato tubers after 100 days was  $0.05 \pm 0.01$  -  $0.18 \pm 0.03$  mg / kg, which does not exceed permissible.

Pre-irrigation. Soil cultivation for planting potatoes by Zenkor at the rate of 0.5-2.0 kg / ha did not naturally change the dry matter content in tubers. At the same time, the use of the herbicide at the rate of 1.0 and 2.0 kg / ha was accompanied by a decrease in the total protein content by 12.9-24.5% ( $p < 0.05$ ).

Tillage at lower consumption rates (0.5-1.0 kg / ha) contributed to an increase in the starch content in potato tubers by 3.9-10.0% ( $p < 0.05$ ). With an increase in the herbicide consumption rate to 2.0 kg / ha, the content of this vitamin in tubers, on the contrary, decreased slightly (5.6%,  $p < 0.05$ ).

At all Zenkora consumption rates, the content of copper and gland in potato tubers increased in comparison with the control by 33.4-69.0% ( $p < 0.05$ ).

An increase in the level of cobalt and molybdenum in tubers was also observed, depending on the rate of application of the herbicide (1.0-2.0 kg / ha), respectively, by 46.1-54.7 and 25.0-39.3% ( $p < 0.05$ ).

Residual amounts of Zenkor in potato tubers after 100 days were found at the level of  $0.07 \pm 0.01$  -  $0.21 \pm 0.02$  mg / kg, which does not exceed the permissible values.

Thus, the use of Zenkor for tillage on potato plantings was accompanied by changes in some indicators of its chemical composition. The direction and severity of the change in the chemical composition depended more on the consumption rates and the growing season, while the type of irrigation was also reflected to a large extent on the level of residues.

In all cases, summer planting potatoes contained less protein than the control. These changes were especially pronounced with a maximum drug consumption rate of 2.0 kg / ha.

It should be noted that according to other indicators characterizing the quality of potatoes, as well as the degree of contamination with Zenkor residues, spring and summer potatoes also differed. However, here, on the contrary, there was a large (by 60-70%,  $p < 0.05$ ) concentration of herbicide residues in spring planting potato tubers.

A comparison of the results of the study of potatoes grown under conditions of different types of cultivation allows us to conclude that, according to the sum of significant shifts, more noticeable changes in the chemical composition of potato tubers were under irrigation conditions. With this irrigation, Zenko residues in tubers were found to be 14-37.5% ( $p < 0.05$ ) more than with groove.

## CONCLUSIONS:

Zenkor herbicide accumulates in the edible organs of cultivated plants and can affect the metabolic processes in crops, and therefore the chemical composition and nutritional value of the resulting food. Stability (persistence), the nature of the processes of migration and translocation of the drug depends on the conditions of irrigation, soil type, consumption rates, type and time of cultivation of crops (spring, summer crops). Taking into account the chemical composition and the value of Zenko residues in tubers, the Zenko consumption rate for spring and summer



planting of potatoes should be considered acceptable from a hygienic standpoint, up to 1.0 kg / ha for the active substance.

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## **THE DEPENDENCE OF MODERN GOVERNANCE ON NATIONAL IDENTITY AND CULTURE**

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### **ABSTRACT**

*The article is devoted to the psychology of national identity, national culture, national traditions, culture, hedonism and hegemonism, and also analyzes the worldview and behavior of people in our country and abroad today. At the end of the analysis, recommendations were developed to improve our national legislation. This is why after the independence a great change is taking place in the national consciousness and lifestyle of our people. Building the foundations of peace, stability and a free civil society in the country enhances initiative, entrepreneurship and national pride in the minds and lifestyles of people. Understanding the rightful place in the world civilization is reflected in the customs, traditions, culture and principles of the people, which are the source of our ancient values. Sustainable development of each nation, the development of individuals today necessitates wide use of national consciousness and culture in social life. From the ancient times each generation, based on the example of their parents and relatives, has shaped their world outlook, traditions and customs in the family have been passed down from generation to generation. In this way, logically, Uzbekistan is not only a homeland in its territorial sense, but also a homeland of Uzbek customs and traditions. However, the development of our national ideology, which is a blessing of independence, also requires this. It is noteworthy that if any ideology aimed at social and spiritual integration for a particular purpose, in Uzbek mentality these goals and opportunities have long been realized. The question is how to use it, how to manage it. Moreover, the excessive standard of freedom and liberty in these countries has led to the moral degradation of society.*

**KEYWORDS:** *Consciousness, Psychology, Culture, Customs, Nationality.*

## INTRODUCTION

Individuals identify themselves through their ethnicity, and each nation is an integral part of humanity. The sense of belonging to a broader worldview raises the individual and the nation to their position, national pride and ambition, and creates a natural need for self-respect and self-respect among the nations of the world. Understanding the rightful place in the world civilization is reflected in the customs, traditions, culture and principles of the people, which are the source of our ancient values. Sustainable development of each nation, the development of individuals today necessitates wide use of national consciousness and culture in social life.

As we know, each nation has its own rich spiritual treasure as one of the oldest nations in the world, as is the language, customs, literature, art and works. Effective use of invaluable heritage of history, national consciousness and culture of our people, not only in improving the way of life, but also in enriching the outlook of the person, and increasing their adherence to the positive qualities of the national character.

In addition, the traditions of our people are an important socio-spiritual basis that builds national consciousness and national culture.

### *Main part*

"National culture," writes Iuda Khudayberdiev, "reflects the national traditions and customs of this nation, is a source of national spirit and mood in other nations, and a sense of responsibility increases.

The national character is also a moral character of the nation, which helps to promote harmony among nationalities and to continue the path of sustainable development. The character of the nation is also revealed through the character of the nation.

The Uzbeks, as well as other nations, have such traditions that their restoration, enrichment, modernization, harmonization with spiritual and educational work can effectively contribute to the spiritual enrichment of the socio-cultural life of the country. Citizens of the country, especially young men and women, have a good knowledge of the traditions of their people, and give them a sense of belonging to the history and future of the state, nation and nation. Our national traditions and customs are the source of national outlook. From the ancient times each generation, based on the example of their parents and relatives, has shaped their world outlook, traditions and customs in the family have been passed down from generation to generation. In this way, logically, Uzbekistan is not only a homeland in its territorial sense, but also a homeland of Uzbek customs and traditions. That is why we are interested in our statehood, language, spirituality, history, future, prosperity of our national state, revival of our traditions and creative Uzbekism. Therefore, the fact that the formation of positive traits of the national character in the person is deliberately abolished during the totalitarian system, the importance of national traditions and customs in shaping the national image, is considered to be a "religious exile, a remnant of the past"; "In the current era, the intensity of globalism, instead of exploring and appreciating positive traits in customs and traditions, requires a greater sense of responsibility for the intensification of efforts to bring the Western worldview habits in the form of a blessing of democracy. Today, the need to preserve and improve our national customs and traditions is threefold." [1]

The main task is to revive and develop the core of our national culture and traditions, on the other hand, to protect them from the ideology of religious extremism and, thirdly, from the

attacks of some foreign "human rights defenders". For this purpose, we must preserve and further develop our traditions of solidarity and unity, which is a priority of our national identity. After all, it is necessary to enrich our national character with the principles of the legacy of our ancestors, the life-saving and exemplary traditions. However, the development of our national ideology, which is a blessing of independence, also requires this. It is noteworthy that if any ideology aimed at social and spiritual integration for a particular purpose, in Uzbek mentality these goals and opportunities have long been realized. The question is how to use it, how to manage it. "The rationalization and individualism of the people of the western countries are hindered by the processes of social cohesion. We have the opposite, because Uzbeks have long been a socialist tendency to integrate."

The principles of humanism in the traditions have a positive impact on the spiritual and moral environment of the society, and through it, the moral image of the person and the character of the nation. More importantly, as society develops, its moral system also needs change. In this sense, "as the individual improves morally according to the needs of society, then the scale of socialization will increase" [3]. This process is also reflected in the historical stability and variability of national customs and traditions.

National customs and traditions are formed and developed over the centuries. If they fail to meet the interests of the individual and society, they will fall off the stage.

The current social and political environment may have a positive or negative effect on the centuries-old traditions and customs of the people, but it is unable to undermine humanistic traditions.

In particular, there are those who believe that young people do not discriminate between traditions and religion, and that hinder the development of society. Whereas, the most developed and developed countries of the world: the people of England, Japan, China, Korea are strictly observing and preserving their national traditions. US scholars, the most advanced country in the history of American society, also attaches great importance to the study of the ethnography of their countries, whose history is not so long ago, and whose ethnicity is proud of their traditions as "we are American." Because living traditions are always based on goodness. It is obvious that the development of humanistic, centuries-old national and modern traditions has been and remains an important and primary factor in the development of a democratic society.

But that's just one aspect. It is important to remember that stability in the American culture and image of the American population is being shattered day by day. In Western countries, there is a tendency for skepticism about democracy as a result of human behavior. [4]

Moreover, the excessive standard of freedom and liberty in these countries has led to the moral degradation of society. For example, in today's European countries and the United States, men and women are losing their cultural identity, and their tendency is to increase lust, goonism, and disrespect for the younger. The most dangerous thing is that such absurdities can affect our society.

Indeed, we are witnessing such a negative impact on the morale, behavior, character and dress of some of our young people in imitating Western standards. According to the well-known philosopher S.Otamurodov, who studied the theory of the nation, "... without knowing the greatness of our fellow-nationalists, they should adopt Western traditions, customs and traditions

as" novelty "and" modernity. " the fact that they are popularized by large sums is unquestionably reflected in the national culture. "[6]

Moreover, these dresses of our women, our women and our daughters, are the same as the beauty of our society, not the oriental culture or the national appearance. "Especially in public spaces, wedding gowns, even educational facilities, in home-based miniature dresses that have become a habit of wearing shoulders, narrow trousers or open skirts, umbilical cuffs, and big chested dresses. When you look at our grandmothers, you want to tell them where our Oriental etiquette, our culture of dress, our dignity and Uzbek ethics have gone. "[7]

Therefore, the most dangerous part of the Western world is that it leads to the psychology of hedonism and hegemonism in the human psyche, instead of human qualities such as kindness and tenderness in the national character.

In some democratic societies of Western countries, the evidence is that social life is growing in the sense that "living is only a luxury" (hegemonism) and "it is a habit to work for one's own sake" (hegomonism).

It is regrettable that the current level of the Western world, especially the cultural and moral level of today's spiritual and moral environment, is not at all compatible with the values of a democratic society that serves human interests and moral maturity. These experiences and circumstances show that the ethical standards of a democratic society create a moral ideal. The Western scholars themselves also put forward their own view of improving the national features associated with traditions and customs. In particular, the English scientist Dis. Ms. Hallowell proposes to preserve the traditional culture in order to maintain the moral climate of the society at the required level [8]. Indeed, in British society, traditional culture, such as family, kinship, support for the needy, and respect for the elderly are virtually gone. It even affects the gene pool of English culture.

It is natural for a democracy to have a diverse lifestyle. Unity, often disregarding individuality, identity, national and other characteristics, while at the same time, these features do not override commonality, and they are all about studying, highlighting, promoting honesty, correctness and propaganda in every aspect of life. in the priority of justice. At the same time, it is important to remember that each person has a place in his / her own understanding of the place, events, principles and factors that influence his / her psyche. In this regard, Monseske wrote: "Many things govern human beings: climate, religion, laws, principles of governance are exemplary examples of the past, ethics, customs - the result of all of this is the common mentality of the people."

## DISCUSSIONS

consequently, rituals form a distinctive aspect of social culture, and they are stable and stable, and are realized by many, not by individuals or individually. For example, respect for parents, respect for the elderly, and hospitality are among the most important values of our people, and they are part of the traditions of the people. The customs and traditions, which are the basis of Uzbekism, have a long history, but they have influenced other generations, tribes and peoples. The rich and spiritual diversity of the customs and traditions of the Turan peoples, especially the Uzbeks, has not been able to bring any worthwhile traditions or customs to the country during the millennium. We can be sure. Examples of these are Alexander Makedonsky's local traditions,

the generalization of Genghis Khan's army of local traditions and principles, the remarkable diversity of the rituals and traditions of the invader General Chernyayev, Governor-General von Kaufman. It is enough to remember that he admits that he is "simple and reasonable". It is necessary to recognize another fact. Whichever of the people is rich in customs, traditions and customs, it is immortal and can live in all aspects of human life. Because the source of social development of society is not only economic factors, but also the worldview of the person who is fed up with the traditions and traditions of the nation, and the stability of the nation as a basis for the future.

Moreover, the important and primary factors of the development of a democratic society are, first and foremost, the national and historical consciousness and culture of the population, based on the traditions and customs of the people [10].

The role of rituals in stabilizing the social environment is also important, and public control over these processes is important. During the development of society a certain system of rituals and ceremonies is formed on the basis of human relationships and the laws of socio-economic development. The centuries-old development will continue to be preserved and refined only in cultures and traditions that reflect the most folk, national characteristics.

In the formation of each nation and nation, certain habits and traditions of people, the environment in which they live, the way of life, the specific language and culture, are the specific conditions and sources.

On this basis, each nation has been formed and developed over a long period of time, with enhanced, stable traditions, rituals, rituals, traditions. It is important to note that all rituals, ceremonies, customs and traditions are based on their interrelationship. Accordingly, it is advisable to give a brief overview of the aforementioned concepts and terms that incorporate the deep, inner and outer nature of culture.

Culture is a social phenomenon, a complex of customs, ceremonies and rituals, rules and norms, norms and requirements that are passed down from generation to generation and maintained by the community.

It also defines the nature and nature of the regime as an integral part of national culture. Tradition, in turn, affects all areas of social life. Tradition is a kind of nation's roots, the history of the people, the image of the nation. Traditions have never been invented, or their existence does not depend on the will of some people, which is caused by the demands of life, the historical character and the spiritual need. This is evidenced by the lifelong traditions of each nation and nation, which defines the system of national culture.

All this contributes to the upbringing of young people in high moral spirit.

The organization and conduct of such ceremonies in accordance with the needs of the nation and the spirit of the people is a reliable basis for respecting the ancient culture of our people and increasing the spirituality of each individual [11].

## RESULTS

In short, it is important that traditions, rituals, and traditions are continuously incorporated into the national culture of the individual as a means of counteracting global threats to humanistic and nationalistic spirit, which promotes social and individual culture and fosters national pride.



First, in the national culture of national traditions, it is important to address such issues as kindness, honoring human and its work, dignity, and the pursuit of a peaceful and tranquil life in the community;

Second - to revive our invaluable spiritual heritage and values based on national culture and traditions, to continue our traditions, to a sense of belonging to the life and destiny of nation and country;

Thirdly, the national culture, though historically stable, has a changing nature. The person and the nation relies on and will continue to serve traditions that will serve them constantly and tomorrow, inviting the individual and the nation for the future. Because living traditions always encourage a person to culture;

Fourthly, Western attitudes and cultures are becoming more and more subversive, morally and emotionally devastating to individuals and nations as a result of the globalization crisis.

Fifth, the social and spiritual significance of national consciousness and culture is to stabilize and strengthen their social environment and human nature. Traditions, rituals, rituals, ceremonies, and traditions continue as interrelations and dialectical unity as national spiritual values;

Sixth - the preservation of national consciousness and culture strengthens the roots of national character, enriching them with new social and spiritual needs and opportunities, and the beauty of national character more clearly.

Seventh - the moral image, beliefs and way of thinking of the person serve as a social criterion for national culture. The national character of the poor and the weak, the thinking mindset, and the helpless will not have integrity and stability. Therefore, culture as a national value indicates the stability of the nation.

## CONCLUSIONS

In conclusion, the socio-economic, political and spiritual changes in the life of a nation and society require changes in the social mood, personality and mind of the nation. This is why after the independence a great change is taking place in the national consciousness and lifestyle of our people. Building the foundations of peace, stability and a free civil society in the country enhances initiative, entrepreneurship and national pride in the minds and lifestyles of people.

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## **RESEARCH OF THE PROCESS OF DECOMPOSITION OF DUST OF CLINKER REDUCING FURNACES WITH NITRIC ACID**

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### **ABSTRACT**

*The results of studies of the influence of the norm of nitric acid on the composition of the liquid and solid phases, the degree of transition of components into solution during the processing of clinker kiln dust. The experimental procedure was as follows: the calculated amounts of nitric acid and dust from clinker kilns were simultaneously loaded into a quartz reactor and mixed for various times (from 10 to 60 min), then the resulting suspension was separated in a centrifuge. The weight method was used to determine the amount of liquid and solid phases. In order to minimize the heat consumption for heating there actor, studies were conducted to establish a minimum temperature that provides an acceptable degree of decomposition of dust from clinker kilns. Thus, with an increase in the rate of nitric acid, the degree of transition of the target components ( $K_2O$ ;  $Na_2O$ ;  $CaO$ ) insoluble increases slightly, and non-target components ( $Fe_2O_3$  u  $Al_2O_3$ ) – increases quite a lot.*

**KEYWORDS:** *Clinker Kilns, Quartz, Thermostat, Tachometer, Nitric Acid.*

### **INTRODUCTION**

The essence of the developed technology for processing dust from clinker kilns consists in its decomposition with nitric acid, separation of insoluble sediment from the production solution, processing of the obtained production solution into finished products.

We used dust from clinker kilns of the Bekabad and Akhangaran cement plants, the chemical composition of which was given in table. 1. Experiments on the processing of dust from clinker kilns were carried out in a laboratory setup consisting of a glass quartz reactor placed in a thermostat. The reactor was equipped with a stirrer, providing intensive mixing. The rotational speed of the electric motor was regulated by a rheostat and measured by a tachometer.

The required amount of nitric acid for the decomposition of dust from clinker kilns was calculated for all cations. The rate of nitric acid ranged from 100 to 200% of stoichiometry.

The experimental procedure was as follows: the calculated amounts of nitric acid and dust from clinker kilns were simultaneously loaded into a quartz reactor and mixed for various times (from 10 to 60 min), then the resulting suspension was separated in a centrifuge. The weight method was used to determine the amount of liquid and solid phases. To find the mass of the precipitate formed, the latter, after centrifugation, was separated from the production solution, washed with acetone and dried at a temperature not exceeding 60 ° C. The liquid and solid phases were analyzed for K<sub>2</sub>O; Na<sub>2</sub>O; CaO; Fe<sub>2</sub>O<sub>3</sub>; Al<sub>2</sub>O<sub>3</sub> according to well-known methods described in the section.

The degree of transition of cations to solution ( $\gamma$ ) was determined by the following formulas:

$$\gamma_{R_xO_y} = \frac{m_1 \cdot C_{R_xO_y}^{\text{dust}} - m_2 \cdot C_{R_xO_y}^{\text{res}}}{m_1 \cdot C_{R_xO_y}^{\text{dust}}}$$

where  $C_{R_xO_y}^{\text{dust}}$  – content R<sub>2</sub>O в dustkiln,  $C_{R_xO_y}^{\text{res}}$  – content R<sub>2</sub>O in insoluble residue  $m_1$  and  $m_2$  – mass of the initial dust of clinker kilns and in soluble residue.

The results of studies of the effect of the norm of nitric acid on the composition of the liquid and solid phases, the degree of transition of the components into the solution during the processing of dust from clinker kilns are presented in Table. 1 and table 2 (experimental conditions: the decomposition process temperature is 40 ° C, the decomposition time is 30 minutes, here in after, an acid with a concentration of 57.5% was used).

Data analysis table. 2 shows that the maximum degree of transition K<sub>2</sub>O; Na<sub>2</sub>O; CaO; Fe<sub>2</sub>O<sub>3</sub> and Al<sub>2</sub>O<sub>3</sub> with a nitric acid rate of 200%, respectively 97,69; 97,85; 98,49; 83,36; 46,41%.

With an increase in the rate of nitric acid, the degree of transition K<sub>2</sub>O; Na<sub>2</sub>O; CaO; Fe<sub>2</sub>O<sub>3</sub> and Al<sub>2</sub>O<sub>3</sub> in the liquid phase increases, although very slightly. Main part K<sub>2</sub>O; Na<sub>2</sub>O; CaO; Fe<sub>2</sub>O<sub>3</sub> and Al<sub>2</sub>O<sub>3</sub> goes into solution already at a rate of 100-110%. A further increase in the rate of nitric acid leads to a slight increase in the degree of transition K<sub>2</sub>O; Na<sub>2</sub>O; CaO; Fe<sub>2</sub>O<sub>3</sub> and Al<sub>2</sub>O<sub>3</sub> in solution compared to 110% nitric acid per 0,55; 0,03; 0,33; 0,92; 9,93 % at normal – 120 %, on 1,72; 0,17; 1,30; 6,14; 24,97 % at normal – 150 % and on 2,54; 0,68; 3,48; 8,96; 44,49 % at normal – 200 %.

**TABLE 1**

The influence of the norm of nitric acid on the composition of the liquid phase formed during the decomposition of dust from clinker kilns

Normal HNO <sub>3</sub> , %	The chemical composition of the liquid phase, mass. %						Ж:Т
	K <sub>2</sub> O	Na <sub>2</sub> O	CaO	Fe <sub>2</sub> O <sub>3</sub>	Al <sub>2</sub> O <sub>3</sub>	NO <sub>3</sub> <sup>-</sup>	
100	1,04	1,10	14,94	0,56	0,60	45,44	19,27
110	0,97	1,02	13,85	0,51	0,59	46,27	20,82
120	0,90	0,95	12,93	0,48	0,58	46,99	22,36
130	0,85	0,89	12,12	0,45	0,56	47,62	23,91
140	0,80	0,84	11,41	0,43	0,53	48,17	25,45
150	0,75	0,79	10,78	0,41	0,51	48,66	27,00
160	0,72	0,75	10,23	0,40	0,49	49,09	28,55
170	0,68	0,71	9,73	0,39	0,47	49,48	30,09
180	0,65	0,67	9,28	0,40	0,46	49,83	31,64
190	0,62	0,64	8,88	0,40	0,44	50,15	33,18
200	0,59	0,62	8,52	0,42	0,43	50,44	34,73

Thus, with an increase in the rate of nitric acid, the degree of transition of the target components (K<sub>2</sub>O; Na<sub>2</sub>O; CaO) in solution increases slightly, and non-target components (Fe<sub>2</sub>O<sub>3</sub> и Al<sub>2</sub>O<sub>3</sub>) – increases quite a lot. In this regard, in order to reduce the transition of non-target components into the solution and reduce the consumption of nitric acid, the rate of nitric acid during decomposition should not be increased by more 100-110 %.

In order to minimize the heat consumption for heating there actor, studies were conducted to establish a minimum temperature that provides an acceptable degree of decomposition of dust from clinker kilns.

**TABLE. 2**

The influence of the norm of nitric acid on the composition of the solid phase formed during the decomposition of dust from clinker kilns and the degree of transition of the components to the solution

Норма HNO <sub>3</sub> , %	Chemical composition solid phase mass. %					Component Transition Rate in solution, rel. %				
	K <sub>2</sub> O	Na <sub>2</sub> O	CaO	Fe <sub>2</sub> O <sub>3</sub>	Al <sub>2</sub> O <sub>3</sub>	K <sub>2</sub> O	Na <sub>2</sub> O	CaO	Fe <sub>2</sub> O <sub>3</sub>	Al <sub>2</sub> O <sub>3</sub>
100	0,84	0,46	11,31	5,98	13,41	94,62	97,19	94,96	52,25	28,53
110	0,74	0,46	10,83	5,95	12,73	95,27	97,19	95,18	52,44	32,12
120	0,66	0,45	10,12	5,89	12,14	95,79	97,22	95,49	52,92	35,31
130	0,60	0,45	9,39	5,82	11,70	96,19	97,25	95,82	53,53	37,63
140	0,53	0,44	8,80	5,73	11,44	96,60	97,31	96,08	54,25	39,04
150	0,48	0,43	8,03	5,55	11,23	96,91	97,36	96,42	55,66	40,14
160	0,45	0,42	7,11	5,25	11,01	97,12	97,42	96,83	58,06	41,30
170	0,43	0,41	6,40	4,83	10,76	97,24	97,49	97,15	61,46	42,64
180	0,40	0,40	5,65	4,16	10,56	97,44	97,56	97,48	66,77	43,74
190	0,39	0,38	4,62	3,35	10,29	97,51	97,67	97,94	73,27	45,16

200	0,36	0,35	3,39	2,09	10,06	97,69	97,85	98,49	83,36	46,41
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**EFFECTIVENESS OF THE APPLICATION OF THE PHYSICAL  
METHOD ON A WOUND BY PLASMA FLOW OF ARGON IN THE  
COMPLEX TREATMENT OF PATIENTS WITH PURIOUS DISEASES  
OF SOFT TISSUES**

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**ABSTRACT**

*Despite the introduction of various methods of influencing the wound healing process, the use of broad-spectrum antibiotics in clinical practice, increasing the virulence of microflora, resistance to many antibacterial drugs and biological variability, difficulties in combating hospital infections, weakening the protective mechanisms of the macroorganism put the problem of treating wound infections in a row very important tasks of practical surgery.*

*Currently available publicly available antibacterial drugs do not have a sufficiently effective effect in isolation. About 42% of lethal outcomes of surgical interventions are associated with purulent-inflammatory complications. **Purpose:** Improving the results of treatment of patients with acute purulent diseases of the soft tissues by the physical method of exposure to the wound with a plasma stream of argon. **Materials and methods:** A study was conducted of 85 patients with acute purulent diseases of the soft tissues with uncomplicated course of the wound process, which were conditionally divided into two groups. The 1<sup>st</sup> comparison group included 45 patients who used the traditional method of treatment, including surgical treatment of a purulent lesion, followed by the application of a levomekol ointment. In the second (main) group, patients after surgical treatment of the purulent foci were additionally treated with a plasma flow of argon. **Results:** In the course of the work, a comparative analysis of the dynamics of biochemical parameters, the speed of cleansing and healing of wounds, as well as the length of stay in hospital treatment showed the advantage of using a physical method of*

treating wounds. **Conclusion:** The developed physical method of additional exposure to a purulent wound accelerated the transition of the wound process to the 2nd phase, allowed to abandon systemic antibiotic therapy and reduce the time of inpatient treatment by 2-3 days.

**KEYWORDS:** Purulent Wounds Of Soft Tissues, Dimexide, And Plasma Flows Of Argon.

## INTRODUCTION

**Rationale:** Despite the introduction of various methods of influencing the wound healing process, the use of broad-spectrum antibiotics in clinical practice, increasing the virulence of micro flora, resistance to many antibacterial drugs and biological variability, difficulties in combating hospital infections, and weakening the protective mechanisms of the microorganism put the treatment of wound infections in a row very important tasks of practical surgery. Currently available generally available antibacterial drugs do not have a sufficiently effective effect on them in isolated form. [1,2]. The number of patients with acute purulent diseases of the soft tissues is up to 35-40% of all surgical patients and tends to increase [5]. In most countries of the world there is no tendency to reduce purulent-septic complications. About 42% of lethal outcomes of surgical interventions are associated with purulent-inflammatory complications [6, 7].

The irrational use of modern drugs for systemic antibacterial therapy and antiseptics (causing, among other things, undesirable side effects, such as severe dysbiosis, etc.), contributes to the formation of multiresistant pathogenic microorganisms in hospitals and can lead to the development of generalization of the infectious process.

Additional methods of physical impact on wound infection, such as laser irradiation, treatment in an abacterial environment, the use of vacuum and hydro-vacuum treatment of wounds, hyperbaric oxygenation and other methods in isolation are not always effective enough, require very expensive equipment and trained specialists, which limits them wide use.

The accumulated experience of clinical and experimental studies has revealed a pronounced bactericidal, phonophoretic, analgesic, necrolytic and stimulating reparative processes action of plasma flows [14]. But even now, surgeons' interest in treating wounds with argon plasma flows does not diminish, as a simple and affordable method of postoperative sanitation of a purulent wound [15].

When analyzing the scientific literature, we did not meet studies on the treatment of purulent wounds of soft tissues using the physical method of exposure to a plasma flow of argon. Our research is dedicated to this.

**The purpose of the work is** to improve the treatment of patients with acute purulent diseases of the soft tissues by the physical method of exposure to the wound with a plasma stream of argon.

## MATERIALS AND METHODS.

The analysis of the treatment results of 85 patients with acute purulent diseases of soft tissues of various etiologies, admitted to the surgical clinic of the Bukhara State Medical Institute and to the Department of Wounds and Wound Infections of the A.V. National Medical Research Center for Surgery Vishnevsky Health Ministry of Russia. Patients were conditionally divided into 2 groups. The 1st comparison group included 45 patients who used the traditional method of treatment, which included surgical treatment of a purulent lesion followed by the application

of a "levomekolum" ointment. In the second (main) group, 40 patients after surgical treatment of the purulent foci were additionally treated with a plasma flow of argon. The study included patients with uncomplicated wound healing without concomitant pathology.

In patients of both groups, indicators of a qualitative and quantitative analysis of wound microflora in dynamics, degree of intoxication, and terms for cleansing and healing of wounds were studied.

## RESULTS AND ITS DISCUSSION

The comparison group I included 45 patients with acute purulent diseases of soft tissues of various localization (abscesses, phlegmon, suppuration of postoperative wounds, mastitis, hydradenitis). At admission, all patients had symptoms of general intoxication of mild to moderate severity. In parallel with general symptoms, local manifestations of the inflammatory process were noted - hyperemia, swelling and tissue infiltration in the wound area. More than 90% of patients were admitted within 2 to 8 days after the onset of the disease.

On the day of admission, all patients underwent surgical treatment of the purulent focus, which was conditionally radical in nature, followed by the application of levomekol ointment on each dressing daily. Systemic antibacterial therapy was prescribed with broad-spectrum drugs (semisynthetic penicillins, cephalosporins of the III generation).

One of the criteria for assessing the wound process was to determine the level of microbial contamination, to identify the species composition of microflora. Bacteriological studies of group I wounds showed the presence of pathogenic staphylococci in 28 cases, of which in the form of monoculture in 10 (22.2%) and in associations in 18 (40%). In 24 patients, *E. coli* was sown, which in 9 (20%) cases was present as a monoculture and in 15 (33.3%) as a part of microbial associations. The next most frequently detected was *Proteus* - 13 observations, seeded in 5 (11.1%) cases as a monoculture and in 8 (17.7%) as a part of microbial associations. Then followed enterococci found in 11 observations - in 6 (13.3%) in monoculture and in 5 (11.1%) in associations, streptococci in 5 observations, in 2 (4.4%) - in the form of monoculture and 3 (6.6%) - as part of the association. *Pseudomonas aeruginosa* was seeded in 2 observations, in monoculture - in 1 (1.4%) and in associations - in 1 (1.4%)

It should be noted that antibiotic-resistant strains of microorganisms were observed in 49% of patients.

Analysis of the results of indicators of intoxication of the body of patients with purulent diseases of the soft tissues of the 1st group revealed the following changes. On the first day of treatment, body temperature averaged  $38.9 \pm 0.40^\circ\text{C}$ , the blood leukocyte content averaged  $9.6 \pm 0.5 \times 10^9 / \text{l}$ , and the volume of medium molecules averaged  $0.196 \pm 0.018$  units. Similarly, there was an increase in LII (leukocyte intoxication index) and ESR (erythrocyte sedimentation rate).

On the third day of treatment, a slight decrease in body temperature from  $38.9 \pm 0.4$  to  $37.7 \pm 0.3$  was noted, the number of blood leukocytes decreased on average to  $8.2 \pm 0.3 \times 10^9 / \text{L}$ . The volume of medium molecules averaged  $0.163 \pm 0.012$  units. A decrease in LII and ESR to  $1.9 \pm 0.15$  and  $37.4 \pm 2.3$ , respectively, was noted.

By the 5th day of treatment in patients of the comparison group, insignificant subfebrile condition remained ( $37.2 \pm 0.40^\circ\text{C}$ ). Moreover, for all indicators of body intoxication: L (leukocytes), AML (average molecule level), LII and ESR of the blood, their further decrease was observed, that is, there was a tendency to normalization -  $7.4 \pm 0.5 \times 10^9$ ;  $0.156 \pm 0.014$ ;

$1.7 \pm 0.12$ ;  $33.3 \pm 2.4$ , respectively. By the 7th day of treatment, these figures, although they had a tendency to further decrease, however, remained above the norm. With further treatment and observation by the tenth day, all the analyzed intoxication indicators, except for ESR of the blood, were within normal limits.

The following criteria for assessing the dynamics of the wound process in patients were the pH of the wound medium, the percentage reduction in the area of the wound surface, and the PC indicators for protein according to M.F. Mazurik (prognostic coefficient for Mazurik). In patients of the analyzed group, on the day of admission, the initial pH level of the wound medium was significantly lower (acidosis) and averaged  $4.4 \pm 0.3$ . Protein of wound exudates was equal to an average of  $59.3 \pm 1.2$  g / l. PC in this case averaged  $1.0 \pm 0.01$  units.

By the third day of treatment, the pH of the wound medium averaged  $4.6 \pm 0.2$ , the percentage reduction in the area of the wound surface per day averaged  $1.2 \pm 0.2\%$ , the protein fraction of the wound exudates was on average  $56.9 \pm 1.8$  g / l, and in the blood -  $68.1 \pm 2.8$  g / l, while the PC according to Mazurik was  $1.1 \pm 0.02$ . By the fifth day of treatment, the pH of the wound medium tended to shift to the neutral side, reaching  $5.2 \pm 0.3$ . The percentage reduction in the area of the wound surface increased to  $2.6 \pm 0.4\%$  per day, and the PC by this time amounted to  $1.4 \pm 0.01$ .

By the seventh day, the PC was equal to  $1.5 \pm 0.03$ , and the wound surface area per day significantly decreased by  $3.5 \pm 0.4\%$ . The pH of the wound medium was on average  $5.6 \pm 0.3$ . Only by the tenth day of treatment did the pH of the wound medium become neutral. The decrease in the area of the wound surface per day became equal to  $3.8 \pm 0.3\%$ . The exudates from the wound ceased, which, in our opinion, is due to the transition of the wound process from the 1st to the 2nd phase.

The following criteria for assessing the dynamics of the wound process were the terms of cleansing the wound from infection and the timing of resorption of wound infiltrate.

In patients of the analyzed group, the elimination of microbes from wounds occurred on average by  $5.5 \pm 0.5$  days. By the 3rd day, resorption of infiltrates was noted. The appearance of granulations was noted, on average, on the sixth day. These data are confirmed by cytological studies.

On the 5th day, the cytological picture was mostly inflammatory and inflammatory-regenerative in nature and only by the 7<sup>th</sup> day was the regenerative type of cytogram noted.

A survey of patients in the comparison group revealed that with the traditional method of treatment it accelerates wound cleansing and normalizes clinical and laboratory parameters. At the same time, to assess the course of the wound healing process, both the indicators of body intoxication (L, AML, LII, ESR) and the biochemical parameters of wound exudates (pH, wound exudates protein, PC according to Mazurik) are of important diagnostic and prognostic value.

Thus, in patients of the comparison group, the wound cleansed of infection only by the 4th day, the beginning of the appearance of granulation by the 6-7th day, the beginning of epithelialization by the 8-9th day, insufficient correction of oxygen saturation of the wound tissue by 10th day of treatment. Biochemical parameters of wound exudates are normalized only by the 10th day of treatment. The average duration of treatment of patients in the comparison group was  $11.5 \pm 0.7$  days.

The II (main) group included 40 patients with acute purulent diseases of the soft tissues who underwent surgical treatment of the purulent focus on the day of admission (also of a conditionally radical nature). Then, additional wound treatment was used with plasma flows of

argon once a day. Systemic antibiotic therapy has not been used. The wound was treated with the Plazmoran plasma scalpel in therapeutic mode from a distance of 20-25 cm from the Plazmoran nozzle to the treated surface at a rate of 30-35 seconds per square meter. See Procedures were repeated on dressings until the wound was completely cleansed.

Bacteriological studies of wounds in patients of group II showed the presence of pathogenic staphylococci in 21 cases, of which 10 (26.3%) as a monoculture and 11 (28.9%) in associations, Escherichia coli in 18 cases, of them in 8 (21%) - in the form of monoculture and in 10 (26.3%) - in associations. Proteus was isolated in 7 observations, of which in 3 (7.9%) as a monoculture and in 4 (10.5%) in associations, enterococci in 4 observations, of which 1 (2.6%) as monocultures and in 3 (7.9%) in associations. Streptococci were present in 6 observations, of which 3 (7.9%) as a monoculture and 3 (7.9%), respectively, in associations, Pseudomonas aeruginosa - in 3 observations, of which 2 (5.2%) - in the form monocultures and 1 (2.6%) in the association.

Dynamic control of the level of microbial contamination of purulent wounds of the analyzed group revealed the following: at the time of receipt, the microbial contamination of the wound was comparable with the first group and amounted to 108 tm / g, after surgical treatment of the wound and local debridement with argon plasma flows, it decreased by 4 orders of magnitude. In the course of the combined treatment, by 2-3 days a decrease in the microbial contamination of the wound in these patients was noted below the critical level, amounting to 103 tm / g of tissue at 103 tm / g.

The study of intoxication indicators in patients with purulent diseases of the soft tissues of the main group revealed the following: the content of wound exudates protein was  $56.8 \pm 1.3$  g / l, PC  $1.06 \pm 0.07$ . Against the background of the application of plasma flows of argon for 3 days, the pH of the wound medium was  $4.7 \pm 0.3$ , that is, a shift to the neutral side was noted. A decrease in the area of the wound surface on average by  $1.3 \pm 0.3\%$  per day. The protein content in wound exudates decreased on average to  $5.45 \pm 1.4$  g / l. Recalculation of PC revealed its growth on average to  $1.2 \pm 0.08$  units.

By the 5th day of treatment, the pH of the wound medium was closer to a neutral medium ( $5.7 \pm 0.3$ ). The daily percentage reduction in the area of the wound surface averaged  $1.7 \pm 0.5\%$ . Protein of wound exudates decreased on average to  $48.3 \pm 1.1$  g / l. In this case, the PC according to M.F. Mazurik was equal to  $1.4 \pm 0.06$  units.

By 7 days of treatment, the pH of the wound environment shifted closer to neutral values -  $6.7 \pm 0.3$ . The decrease in the area of the wound surface reached an average of  $3.5 \pm 0.4\%$ . Protein of wound exudate decreased to  $45.4 \pm 1.2$  g / l. PC was equal to  $1.6 \pm 0.05$  units.

By 9-10 days of treatment, the pH of the wound medium had a stable neutral value. The decrease in the area of the wound surface reached an average of  $3.7 \pm 0.3\%$ .

A comparative analysis of the treatment results of both groups revealed a significant advance in terms of cleansing and wound healing in patients of group II by 1.5-2 days.

Rapid normalization of the pH of the wound medium in patients of the II group was noted already on the 7th day of treatment. In patients of group I, the pH of the wound environment became neutral only by the 10th day of treatment. Patients of the II group on the 6-7th day of treatment had a regenerative type of cytogram, while in the I group the cytological picture had an inflammatory and inflammatory-regenerative character.

The use of the physical method of treating a wound with a plasma stream of argon in patients of the second group contributed to the complete cleansing of the wound from infection by the 3rd day of treatment. On the 2nd day, they observed active resorption of the infiltrate around the



wound. The appearance of granulations was noted on the 5th day of treatment, and epithelization - 6-7 days, which was significantly ahead of these indicators in terms of time in the 1st group by 1.5-2 days. The average duration of treatment of patients of the II group was  $8.5 \pm 0.8$  days.

Modern drug therapy of wound infection is based on the use of antibiotics. However, pathogenic microorganisms that play a major role in the etiology of surgical infection have high virulence, multiple antibiotic resistance, and biological variability. Currently available publicly available general and local antibacterial drugs do not have a sufficiently effective effect on them [1.8-11]. Financial costs for the treatment of patients with wound infection are growing, which significantly undermines the budget of the surgical hospital [12, 13]. This indicates the need to review the monopolistic use of antibiotics and the transition to a more informed strategy and tactics for the treatment of purulent-septic diseases, as well as the development of more effective methods of influencing the micro flora of wounds. Our results showed that one of the ways to solve this problem is to use the physical method of exposure to a purulent wound.

Our proposed method improves the biochemical and cytological parameters of wound exudates, allows you to accelerate the time of wound cleansing by  $1.5 \pm 2.0$  days and reduce the length of hospital stay in patients of the main group by  $3.2 \pm 0.3$  days compared with the comparison group.

#### **CONCLUSION:**

1. The use of surgical treatment of a purulent foci with a physical effect on the wound with an argon plasma flow in patients with acute purulent diseases of the soft tissues is the most optimal, because it contributes to faster and better cleaning of the wound surface from purulent necrotic tissues and microbial bodies, reducing intoxication and acceleration of regenerative processes, which together allows you to reduce the time of their treatment and rehabilitation.
2. The proposed method for the treatment of patients with acute purulent diseases of the soft tissues with uncomplicated course of the wound process allows you to abandon systemic antibiotic therapy, and thereby avoid complications associated with its use.

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## **EMPLOYEES' ROLE OVERLOAD AND WORK-FAMILY CONFLICT: DO EMPLOYEES GENDER AND DESIGNATION MATTERS?**

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### **ABSTRACT**

*This study was carried out to measure employees' role overload on their work-family-conflict. Furthermore, the study aimed to measure employees' gender and designation's moderating role in the relationship between their role overload and work-family-conflicts. Four hundred and eight respondents were taken as a sample from the employees working in Nepalese microfinance companies. Positivist research philosophy and deducting reasoning approach was adopted. Multiple regression analysis was applied for quantitative analysis of cross-sectional data. All the ordinary least square methods' assumptions were satisfied before running the model. The present study revealed that (i) employees' role overload was positively associated with their work-family-conflict, (ii) gender and designation moderated the relationship between role overload and work-family-conflict, (iii) male and female employees' work-family-conflict occurred due role overload was not in the same direction. Female employees' work-family-conflict was increased as an increase in their role overload, but male employee's work-family-conflict was decreased as increase in role overload, and (iv) managerial level of employees' work-family-conflict due to role overload was less than the non-managerial level of employees. Numbers of practical and theoretical implications were suggested. Directions for further study are pointed out.*

**KEYWORDS:** *Role overload, work-family conflict, gender, designation, categorical moderation.*

## INTRODUCTION

With society's modernization, peoples' needs and expectations are drastically changing. To fulfill those needs and satisfaction, they have to work more and more. Consequently, work-force characteristics are changing. Dual career family members are forcefully increasing. Not only have to meet financial needed, for personal advancement and satisfaction, but dual-career people are also growing. As a result, dual-earner couples and their consequences became academic discussion issues. While fulfilling dual-role, it is natural to have stress and conflict between work life and personal life. According to experts in the area, role overload is a significant factor that distinguishes role conflict and its negative consequences, as Michel et al. (2011) reported. It may be a product of the numerous pressures of work and family life (e.g., Michel et al., 2011). Role workload is a significant stressor associated with various outcomes. There has been considerable published research on role overload and its impact on the psychological and behavioral consequences of employees, such as organizational commitment and absenteeism (Duxbury & Higgins, 2001).

Employees today are experiencing more difficulties than ever balancing work and family roles. Work-family conflict is a type of inter-role conflict that happens when work interferes with family demands or when family demands compete with work obligations (Greenhaus & Beutell, 1985). The work-family dispute has both work and family-related effects, like poor work results, career and life satisfaction, burnout, absenteeism, social well-being, and frustration (Greenhaus & Parasuraman, 1999). As a result, in recent decades, scholars have sought to explain the potential antecedents that influence work-family conflict (Cinamon et al., 2007). Owing to current demographic patterns and societal transformations in the population, the topic of work-family tension has gained expanded study focus during the last three decades. Since people have less influence on their work lives than their family lives, work tension tends to be a more effective indicator of work-family conflict than family conflict (Higgins & Duxbury, 1992). However, less attention was paid to measuring the employees' family conflict created due to the role overload.

Moreover, all the employees' work-family-conflict might not be affected in the same way due to the role overload. Some people might have severe role overload, and others might not have because people are different. Their tolerance power might be extra, time and involvement might be different. Therefore, employees' demographic aspects (e.g., gender and designation) might have a crucial role in the relationship between role overload and work-family-conflict. But, precisely, we have lacked proper study in these subject matters.

Hence, in the context of employees working in the Nepalese microfinance institution, the present study aimed to measure: (a) effect of employees role overload on their conflict with family, (b) role of the employees' gender (male versus female) in the relationship between role overload and work-family-conflict, and (c) role of the employees' designation (managerial versus non-managerial) in the relationship between role overload and work-family-conflict. Moreover, the present study measures role overload on work-family-conflict for male employees separately, for female employees, for the managerial level of employees, and employees' non-managerial level.

## **Literature Review and Hypothesis**

### **Role Overload**

Work stress occurs when people are overloaded by deadlines, perceived time pressure, unrealistic task expectations, and knowledge overload (Ganster et al., 1986). In the literature, the expressions task dispute and meaning of overload are often used interchangeably, but they apply to two different definitions. The degree to which an individual faces stresses in one position that is incompatible with the pressures occurring in another role is role conflict (Kopelman et al., 1983). Function overload, on the other hand, which is one of the determinants of role dispute, occurs only when one role's demands find it impossible to meet the demands of different positions (Coverman, 1989). Work overload applies to a situation in which the amount of needed performance is unacceptable (Kopelman et al., 1983). It happens when various demands outweigh resources and can be either contextual (when a job is too complicated to complete) or quantitative (when there are too many tasks that need to be done) (when there are too many tasks that need to be done).

### **Work-Family-Conflict**

Work-family conflict is viewed as a type of inter-role conflict in which one function's demands inhibit the other's ability to fulfill that task's pressure (Lu et al. 2006). The conservation of energy hypothesis may also be used to describe work-family disputes (Kossek et al., 2011). Employment pressures, for example, will find it impossible to commit one's resources (time, attention, and effort) to addressing the needs of one's family (Lapierre & Allen, 2006). Consequently, tension occurs when resources are exhausted in one domain when the other is ignored.

Numerous reports have focused on the work-family rivalry in dual-career couples (Greenhaus & Beutell, 1985). Conflict occurs when one role's expectations make it difficult to commit adequate resources to other tasks; one role's pressure makes it difficult to fulfill the requirements of another; and one role's unique actions make it difficult to fulfill the requirements of another. These three causes manifest in three distinct forms of work-family conflict: time-based, strain-based, and behavior-based (Elloy & Mackie, 2002). When several tasks compete for a person's attention simultaneously, and the time expended on one task inhibits the proper execution of other duties, time-based conflict arises. As a result, such tension is related to task overload and role conflict, all of which may be caused by the excess. Factors such as performing a disproportionate amount of hours, making an inflexible daily schedule, or having to work shifts are also organizational causes of time-based tension (Schein, 1993). Workplace or home stressors may trigger discomfort, anxiety, exhaustion, depression, and irritability, contributing to stress-related symptoms like tension, anxiety, fatigue, depression, and irritability (Hertz, 1986). Behavior-based disagreement may arise when one source's behavioral preferences conflict with those of another. Relevant habits of position behavior, for example, could be conflicting with standards for conduct in another role (Greenhaus & Beutell, 1985).

### **Role Overload and Work-Family-Conflict**

Function overload has been shown to diminish workplace dedication and raise absenteeism due to sickness (Mulki et al., 2006). Since task overload requires workers to devote their time and energy to dealing with overwhelming demands, an employee who perceives extreme role overload has lower work satisfaction and lower job results (Brown et al., 2005). Employees

used personal time to deal with job pressures, according to Duxbury and Higgins (2001), and they were often forced to carry work home. Role overload, in other words, will interrupt social and family life while also impacting employee well-being. Multiple functions, according to studies, cause tension, which may lead to pressure and conflict at work (Green & Zenisek, 1983), particularly when work and family obligations conflict (Greenhaus & Beutell, 1985). Job overload, position tension, and role uncertainty are common triggers of stress, contributing to work-family conflict (Elloy & Mackie, 2002). According to Piesah et al.(2009), function overload is a precursor to significant employee attitudes and behaviors. Hence, based on these empirical shreds of evidence and logic, the present study proposed the following hypothesis 1.

*Hypothesis 1:* employees' role overload positively impacts their work-family-conflict. It means an increase (or decrease) in employees' role overload cause to increase (or decrease) their work-family-conflict.

### **Interactive Effect of Employees' Demography and Role Overload on Work-Family-Conflict**

Dual-career partners are more likely to experience overload in their personal and professional lives. Since work pressures restrict the resources available for home and family duties, they are more vulnerable to household overload. Gender position theory relates to people's views and opinions on how family and job responsibilities are separated depending on gender (Harris & Firestone, 1998). Gender identity theory is generally thought to be developed by socialization or gained by practice (Lachman, 1991). These views usually fall on a spectrum ranging from conservative to progressive. Traditional gender role attitudes reinforce or adhere to expected inequalities between feminine and masculine positions. In contrast, feminist gender role attitudes oppose gender inequality and assert that men and women can fairly divide family and job roles (Harris & Firestone, 1998). Hence, male and female employee work-family conflict may be affected differently due to the role overload. Aligning these theoretical arguments and logics, the present study has proposed the following hypothesis 2.

*Hypothesis 2:* Impact of role overhead on work-family-conflict moderates by the employees' gender. Male and female will have a different level of association between role overload and work-family-conflict

Careers in the paying workplace typically include substantial expectations in working hours and research dedication and some job habits that are "corporate comfortable" rather than convenient for regular family schedules (Schein, 1993, p. 22). Managerial and non-managerial workers, of course, conduct various styles of jobs. Their powers, duties, and accountability are all distinct. Furthermore, managerial and non-managerial staff have separate facilities and standards. Managerial community with the potential for rapid development, progression, and mobility, as well as all the risks that come with being on a fast track. They will travel freely and easily between organizations, bringing their management expertise with them. Non-managerial employees composed of the vast majority of employees up to and including the foreman level would enjoy the benefits of an intensive company-oriented training period, lifetime employment, pay increases, and job promotions primarily based on length of service. Hence, managerial and non-managerial employees' work-family-conflict due to role overload might be different. Based on these conceptual assumptions and logic, the present study proposed the following hypothesis 3.



Hypothesis 3: Impact of role overhead on work-family-conflict moderates by the employees' designation. Managerial and non-managerial employees will have a different association between role overload and work-family-conflict.

## Methods

### Measure

Work-family-conflict was measured by Netemeyer et al.'s (1996) five items scale. A sample item of the work-family-conflict includes – my job produces strain that makes it difficult to make changes to my plans for family activities. Role overload was measured by five items scale developed by Peterson et al. (1995). A sample item includes- the amount of work I have to do that interferes with the quality I want to maintain. All the work-family-conflict and role overload items were measured in five Point Likert-types scale, i.e., strongly disagree (1) to strongly agree (5). Respondents had rated each item what was best described for them with each items. Likewise, employees' gender and designation were measured as categorical variables with the help of a dummy variable. To measure gender, dummy code was assigned as male = 0 and female =1. Similarly, non-managerial employees = 0, and managerial employees =1 were coded as a dummy variable. Cronbach alpha of the construct work-family-conflict and role overload were measured .86 and .91 respectively in this study.

### Questionnaire Administration and Respondents

Respondents were taken from the employees working in microfinance companies (Grade 'D' financial institutions) in Kathmandu valley. First of all, thirteen microfinance companies were selected as per the convenience of the researcher. The convenience sampling method was used to select the respondents. A referent people, who was provided by the concerned microfinance, supported distributing and collecting back the questionnaires. Altogether 600 questionnaires were distributed, but 515 (86%) responses were received within a given period. Returned questionnaires were refined, removing the unengaged responses, incomplete responses, and outlier responses. Finally 408 (68%) responses were considered for analysis. Among responses considered for analysis, 300 (73%) were male, and 108 (27%) were female employees. Likewise, 302 (74%) employees were non-managerial, and the remaining 106 (26%) were the managerial level of respondents. Similarly, 213 (52%) were married, and 195 (48%) were unmarried employees.

### Data Analysis

After ensuring the reliability of the measure, the assumptions for the linear regression analysis were tested. Especially, (a) histogram and normal Q-Q plot have been plotted to test the normality of the residual (2) homoscedasticity has been tested plotting to scatter plot, (3) linearity of the dependent and independent variable have been measured plotting regression standardized residual, and (4) multicollinearity diagnostic have been tested calculating variance inflation factors (VIFs) to measure the correlated error among the study variables. Visual inspection of the Q-Q plot and histogram, scatter plot, and regression standardized residual curve respectively, have ensured that the data are normally distributed, no heteroscedasticity, and dependent and independent variables are linear. VIFs scores less than ten are typically considered acceptable evidence of multicollinearity (Tabachnick & Fidell, 2001).

After ensuring the normality of the data, frequency distributions have been calculated to describe the respondents' size of demographic variables. Lastly, causal relationships from inferential



statistics were calculated. Multiple Regression Model (MRM) has been estimated to measure the significance of the direct association of independent variable with dependent. As the guidelines provided by Baron and Kenny (1986), the hierarchical regression model has been calculated to measure the interactive effects. The t-test has been computed to measure the significance of association of single variable, and change in  $R^2$  has been calculated to measure the significance of adding another variable in the model. Moreover, to show the interactive effect more clearly, ModGraph, as suggested by Jose (2008) has been applied.

## Results

As depicted in Table 1, employees' unstandardized coefficient of role overload to predict their work-family conflict was positive and statistically significant ( $B = .77$ ,  $p < .01$ ,  $\Delta R^2 = .54$ ). This indicated that an increase in employee role overload positively causes to increase in their work-family conflict, contributing 54% variation in the model. Hence, hypothesis 1 is supported.

**TABLE 1**

**REGRESSION RESULTS: DIRECT AND INTERACTIVE EFFECT OF ROLE OVERLOAD AND EMPLOYEE'S DEMOGRAPHY ON WORK-FAMILY-CONFLICT**

Predictors		Dependent Variable: Work-family-conflict	
		Model 1	Model 2
Step 1	Main effect		
	Role overload	.77**	.77**
	$\Delta R^2$	.54**	.54**
Step 2	Moderator's effect		
	Gender	.68**	
	Designation		-.17**
	$\Delta R^2$	.04**	.01*
Step 3	Interactive effect		
	Role overload x gender	.69**	
	Role overload x designation		-.27**
	$\Delta R^2$	.05**	.03**

Step 3 in Table 1 is used to predict the interactive effect of the independent variable (i.e., role overload) and moderating variables (i.e., gender and designation) to predict work-family-conflict. As depicted in Model 1, step 3, in Table 1, coefficient of interactive effect of role overload and gender to predict work-family-conflict was statistically significant ( $B = .69$ ,  $p < .01$ ,  $\Delta R^2 = .04$ ) with contributing 4% additional variation in model. Hence, hypothesis 2 is supported. Likewise, coefficient of interactive effect of role overload and gender to predict work-family-conflict was statistically significant ( $B = -.17$ ,  $p < .05$ ,  $\Delta R^2 = .01$ ) with contributing 1% additional variation in the model (model 2, step 3, in Table 1). Therefore, hypothesis 3 is supported.

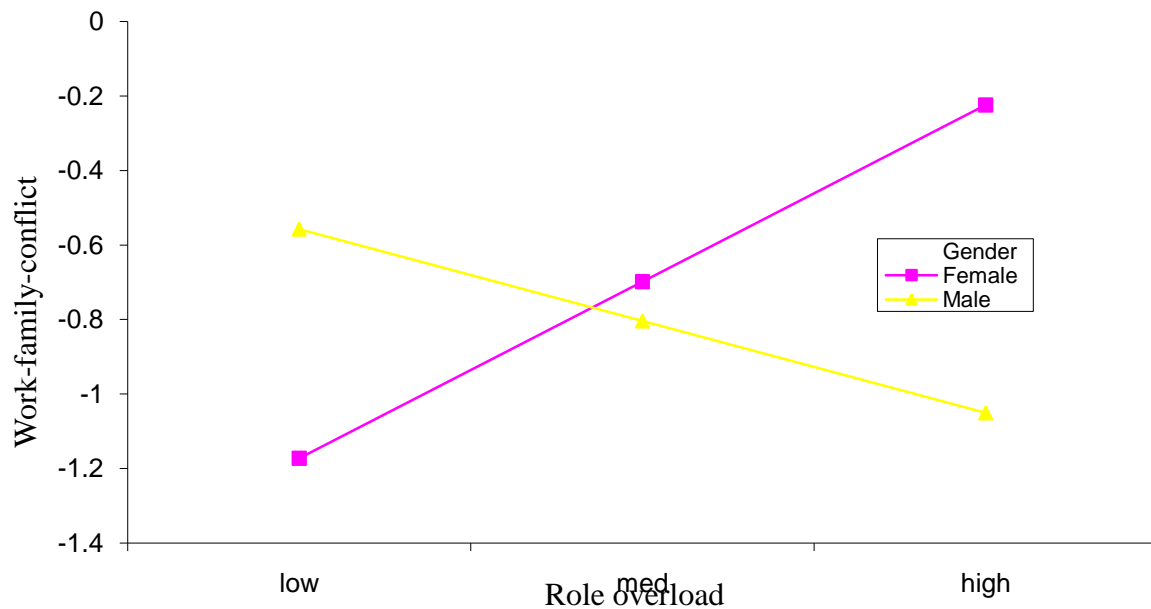


Figure1: Interactive effect role overload and gender on work-family-conflict

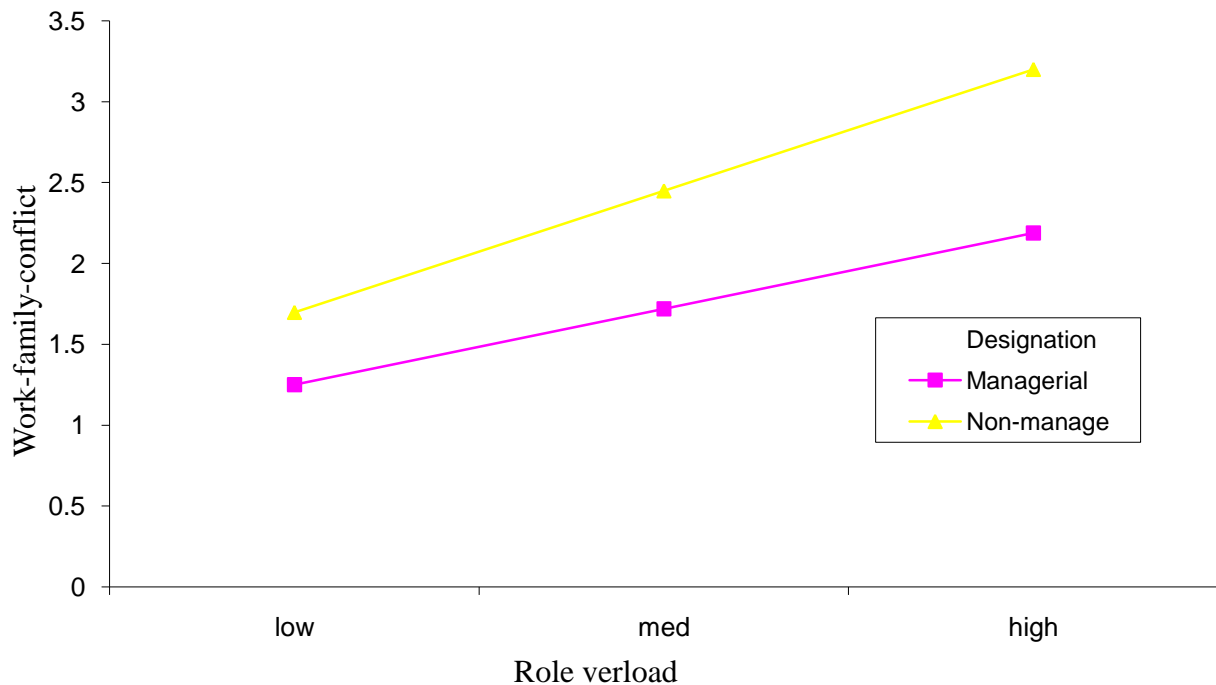


Figure 2: Interactive effect of role overload and designation on work-family-conflict

As suggested by Jose (2008), moderation was presented in graphs to measure the moderation of categorical variables (gender and designation) more precisely. As shown in Figure 1, for the female employees, there was a positive prediction of role overload to predict work-family-

conflict. But, for the male employees, there was a negative prediction of role conflict to predict work-family-conflict. In high role overload, female employees were facing a high level of work-life-conflict, and male employees were facing less work-family conflict. Likewise, in less role overload, male employees were facing a high level of work-family-conflict and female employees were facing less work-family conflict.

Regarding the moderation of employees' designation in the relationship between role overload and work-family-conflict, Figure 2 shows the precise form of moderation. As shown in Figure 2, both managerial and non-managerial employees' role overloads predict their work-family-conflict positively. But the managerial level of employees' work-family-conflict is lesser than non-managerial employees whether their role overload is low or medium or high.

## DISCUSSION

This study revealed that employees' role overload positively affected their work-life-balance. It indicated that if employees have role overload, their conflict with family will increase. These findings consist with the number of prior studies carried out in different contexts like Elloy and Mackie (2002), Aminah (2010), Foley et al. (2005), and Greenhaus and Beutell (1985). All these studies tested that role overload cause to create work-family-conflict. But, finding the present study contradicts with Ishii's logic- Kuntz (2013) who states that young generation, men have become more involved in household tasks and childcare than they were in the past. Thus, as fathers today may also experience role strain due to work and family's conflicting demands (Ishii- Kuntz, 2013). Hence, finding the present studies cannot be generalized if employees are role overloaded, disturbing their family life and creating conflict with family members. Further studies are encouraged to carry out segregating modern men and traditional men while measuring the role of gender in the relationship between role overload and work-family-conflict.

Likewise, the relationship between role overload and work-family-conflict was moderated by employees' gender and designation. Male and female employees' work-life-balance was not equally suffered due to the role overload. Female employees' work-family conflict increased as increased in their role overload. But Male employees' work-family-conflict was decreasing as the level of role overload increased. This is the present study's novel findings and cannot compare exactly with the prior empirical evidence. However, it supports the opinion of Harris and Firestone (1998), who state that traditional gender role attitudes reinforce or conform to expected differences in feminine and masculine roles. It is possible because women still devote significantly more hours than men to household chores and childcare (Goni-Legaz et al., 2010). In contrast, men devote significantly more hours to the work domain than women (Stier, 2010). Thus, as in the past, women still show a greater tendency than men to perceive family roles as their main responsibility, whereas men show a greater tendency to perceive the employment role as their main responsibility (Christiansen & Palkovitz, 2001). Although the experience of work-family-conflict and family-work-conflict may harm the emotional being of men and women (Kulik & Liberman, 2013), it can be assumed that women are more sensitive to the interference of work demands with the family domain, whereas men are more sensitive to the interference of family demands with the work domain. However, further studies are suggested to replicate the study to make the theory generalizable.

Similarly, work-family conflict of employees' managerial level and non-managerial level of employees were not affected due to role overload. Both managerial and non-managerial employees' work-family-conflict was positively impacted due to the role overload, non-managers

level of conflict was more than the managerial level of employees at every given level of role overload. This is another novel finding of the study, and there is no empirical evidence to compare and contrast the results. The plausible cause for such findings might be the authorities and flexibility associated with the position. The higher level of employees will have more authority and will not be pressured from the top management. They can easily reschedule their work schedule based on priority. Moreover, they are getting more benefits and that benefits might be used for managing family role differently. Several scholars have argued that perceived organizational support positively impacts work-family conflict (Dixon & Sagas, 2007). Flexible work practices and supportive supervisors have been strongly associated with lower work-family conflict and job dissatisfaction (Thomas & Ganster, 1995). Hence, managerial employees may be less suffered from role overload in work-family conflict. Further studies are suggested to replicate the current study incorporating the authorities and responsibilities associated with employees' level.

### **Implications**

The present study suggests several theoretical implications. As this study revealed that role overload cause to increase in work-family-conflict, managers can intervene to assign optimum workload to the employees so that work-family conflict and its consequences will be minimized. Likewise, this study revealed that female employee's work-family conflict occurred from the role overload, but male employees' work-family conflict decreased with increased role overload. Managers can focus on decreasing workload to minimize employees' work-family-conflict. Similarly, employees' non-managerial level of employees' work-family conflict was higher than the managerial level of employees. Hence, organizations can prioritize intervention to minimize work-family conflict through restructuring the workload of the employee's non-managerial level. The marginal benefit due to intervening in the work load will be greater for those employees and organizations.

### **Theoretical Implications**

### **Practical Contribution**

This study tested that male employees' work-family-conflict increased with decrease in their workload. This is quite an unexpected result and opposite to general concept and logic. In general, there are positive relationships between employee role overload and their work-family-conflict. Even in this study, female employee's role overload is positively associated with role overload. Therefore, for the researcher, this finding will be a foundation for further research to uncover the reasons why male employees are experiencing less work-family-conflict while increasing workload. The present study also added new empirical evidence on how managerial and non-managerial employees' work-family-conflict was affected by their role overload.

### **CONCLUSION**

Employee's role overload contributes to increasing their work-family-conflict. Male and Female employees' work-family-conflict occurred due to role overload were not equal. Female employees' work-family-conflict increased as an increase in their role overload, but male employees' work-family conflict decreased as increased role overload. Likewise, employees' managerial level and non-managerial level of employees' work-family-conflict occurred due to role overload is not equal. The managerial level of employees' work-family-conflict occurred due to role overload is less than the non-managerial level of employees.

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