PAKISTAN JOURNAL OF HEALTH

OFFICIAL RESEARCH JOURNAL OF INSTITUTE OF PUBLICH HEALTH, LAHORE

VOLUME 52 APRIL - SEPTEMBER 2022 ISSUE 02, 03

PRINTED BY
TALAL PUBLISHERS
9- ROSE CENTRE, KABIR STREET, URDU BAZAR LAHORE
0300-4327951
HEC RECOGNISED: "Y" CATEGORY

TABLE OF CONTENTS

Editorial

The summer and monsoon seasons of 2022 brought along a marked increase in cases of Acute Watery Diarrhoea (AWD) in Punjab. Hospitals were overwhelmed by the high number of patients presenting with dehydration and salt depletion. The response by the healthcare workforce was admirable, the relevant authorities were notified immediately and efforts were make for case confirmation. Institute of Public Health played a pivotal role in the case confirmation efforts. Stool samples from Government hospitals were tested at Public Health laboratory and Vibrio Cholera was confirmed. The stool testing also revealed that a significant portion of the samples showed antibiotic resistant strains of Vibrio, indicating the need to strengthen our antimicrobial stewardship practices.

Cholera is a highly communicable disease that can be controlled by improving public sanitation and hygiene practices as well as the provision of safe drinking water. The risk of cholera is considerably increased in humanitarian emergencies, when there are significant population movements and crowding in sites where displaced persons gather and frequent disruption of, or inadequate, access to healthcare services, clean water, sanitation and hygiene. Many areas in Pakistan are facing such humanitarian emergency in the shape of flooding, which puts a large number of people at risk for AWD.

The recurring outbreaks of AWD in our country indicate towards the need to strengthen preventive health systems and to educate the masses on healthier and safer lifestyle choices. In addition, there is dire need for issuing evidence-based guidelines for prevention and management of AWD. Such guidelines should be context and country specific, written by an expert panel well versed in clinical and preventive disciplines and widely distributed throughout the province. It is essential that the adherence to the accepted guidelines is ensured by proper training and education of healthcare workers.

There is a need for a comprehensive and multi-sectoral response to AWD outbreak, including: epidemiology, case management, water, sanitation and hygiene (WaSH), logistics, community engagement and risk communication. All efforts must be well coordinated to ensure a rapid and effective response across sectors. Not only limited to outbreak response but also for preparedness and long-term prevention activities. In the long term, improvements in water supply, sanitation, food safety and community awareness of preventive measures are the best means of preventing cholera and other diarrheal diseases.

Frequency of Malnutrition in Adolescent boys of Jamia Ashrafia

Mudassar,[1] Seema Imdad,[2] Saima Ayub,[3] Anjum Razzaq,[3] Muhammad Umar Farooq[3]

Abstract

One of the most challenging periods for human growth and Nutritional health status is Adolescence. Adolescence can be defined as a period of life which is ranging from 10 to 19 years of age. Malnutrition is a condition which develops from excess or deficiency of calories and nutrients. It can be assessed by anthropometric, clinical, laboratory and dietary methods. To find out the frequency of malnutrition in adolescents and factors causing it in adolescents at Jamia Ashrafia.

Material and Methods: Cross sectional descriptive study was conducted with all Adolescents of Jamia Ashrafia for malnutrition. Sample technique was universal. Data of all adolescents was entered on a performed questionnaire. Heights and weight was measured by using measuring tape and weight machine respectively. Clinical assessment was also carried out with the help of general physical examination. Nutritional assessment was done through questionnaire. Data was analyzed using SPSS version 20.0. Frequency tables were generated for all possible variables. Mean and other parameters of central tendency were calculated for continuous data. Chi Square was applied to find out association between categorical variables. Proper verbal consent was obtained from the Nazam of Jamia Ashrafia before data collection and confidentially of the data was also ensured.

Results: Result that was obtained from the study after data analysis is; stunted adolescents among 106 adolescents were 48 [45.3%] and undernourished adolescents among 106 adolescent were 5 [4.7%]. Among 106 adolescent boys mean age was 16.93 years, mean weight was 59.88kg, mean height was 61.26 inches, mean BMI was 25.96 and mean MUAC was 9.18cm. Among the 106 students 42 [39.6%] had some kind of medical history and 61[58.1%] and 44[41.9%] had some sort of paternal and maternal disease history respectively, 100% students were fully vaccinated.

Conclusion: Study concluded that prevalence of stunted and undernourished among 106 adolescents was associated with following factors; Family income, Medical condition, Demographic variables, Clinical condition and food consumption. Adolescent boys had no access to diverse and adequate food tend to be more malnourished. The effect of these determinants can be used to develop strategies for reducing malnutrition.

Keywords: Malnutrition, Body mass index, vaccination, Mid-upper arm circumference.

Introduction:

Nutrition is the science which interprets the interaction of nutrients and other substances in food in relation to maintenance and promotion of health, growth, reproduction, disease prevention. It includes food intake, biosynthesis, absorption, catabolism and excretion.[2] Nutrition is the key element of socioeconomic development of a country. It is an important component of sustainable development goals (SDGs) and primary health care, and Pakistan is fully determined to implement both. It is essential to make significant progress in nutrition in order to achieve other SDGs.[5] Better nutrition means stronger immune systems, better health, less illness, and a productive community. Historically, the science of nutrition developed in part from the study of disease entities brought about by inadequate diet. Nutritional status is the condition of health of an individual which is influenced by nutrient intake and physical

1. *Punjab Institute of Cardiology, Lahore*
2. *Retired*
3. *Institute of Public Health*

Correspondence:
Mudassar, Punjab Institute of Cardiology, Lahore

Submission Date: 00-00-0000
1st Revision Date: 00-00-0000
Acceptance Date: 00-00-0000

health of the body.

Malnutrition can be defined as impairment of health which is arising from excess or deficiency or imbalance of nutrients in the body. Adolescent is an important period in individual's life. In developing countries like Pakistan various forms of malnutrition affect a large segment of population and both micro and macronutrient deficiencies are of major concerns. The most recent estimates (1996-2005), in developing world (Pakistan, Bangladesh, India etc.) approximately 146 million children are underweight, out of these 57 million children are living in India[1] Thatcher[3] and Amirthaveni and Barikor[4] suggested that the health of children is dependent upon food intake that provides sufficient energy and nutrients to promote optimal social, physical, cognitive growth and development. The World Health Organization (WHO) estimates that almost 3 billion people are affected from malnutrition of one kind or other. One out of five people suffer from the worst of variants of malnutrition - hunger. All forms of malnutrition are associated with significant morbidity, mortality and economic costs, particularly in countries where both under and over-nutrition co-exist as is the case in developing countries undergoing epidemiological transition[5] Half of the world's malnourished population live in just three countries: Bangladesh, India and Pakistan.

Assessment of nutritional status is determined by: Anthropometry includes all body measurements. The most important method for assessing nutritional problems in different groups of the population is possible with the help of anthropometric measurements.[6,7]

Adolescence is considered healthiest development phase as compared to childhood and adulthood. Specifically malnourished adolescent mothers more likely to give births to children with low birth weight, physically stunted, reduced physical capacity as well as high risk of morbidity and mortality. Rapid development and growth associated with adequate nutrition and prevent intergenerational effects of under nutrition. Healthy adults also provide opportunity to accelerate progress in advance human potential. In 2016, it was determined that Ethiopia has lowest average of BMI for both sexes.[8] At least 500,000 children die each year from severe acute malnutrition (SAM), these children also weakened immunity more susceptible to long term developmental delays and chronic disease in later life. Children suffering from Moderate Acute Malnutrition (MAM) are also at higher risk of death as compared with those who are not acutely malnourished. SAM is treated with ready to use therapeutic foods (RUTF) in outpatient therapeutic programs (OTP'S) supplied and led by UNICEF.[9]

Methodology

A questionnaire based cross sectional study was conducted by interviewing the students who follow the inclusion criteria and the data was collected from Jamia Ashrafia. Permission from the Nazim of madrasa was obtained. Verbal consent from the parents and students was obtained. Purpose of study was explained. Privacy of data was maintained. Data was collected by researcher himself. The data collection tool is semi-structured interview questionnaire duly approved by research committee containing questions for socio demographic profile, food consumption and medical history. Anthropometric measurements include weight; height and MUAC were measured with the help of weight machine and measuring tape respectively. Moreover, data for nutritional and clinical assessment in adolescents was obtained with the help of general physical examination.

Data Analysis

The completed questionnaire was analyzed with the help of SPSS version 20.0. Frequency tables [stunted, undernourished, demographic, medical condition, clinical assessments and food consumption were generated for all possible variables. Means and other parameters of central tendency [weight, height, MUAC, BMI, Family income, Adolescent's age, father age, and mother age] were calculated for continuous data. Chi Square was applied to find out association between categorical variables. Bell shape diagrams were used to present categorical data.

Results

Among our 106 adolescent boys 58(54.7%) were normal and 48 (45.3%) were stunted. If we compare the BMI to age of boys 101(95.3%) were normal and 5 (4.7%) were undernourished.

Among the 106 adolescent boys the minimum age was 12 years and the maximum age was 19 years with the mean age of 16.93±1.55 years. Father's minimum age was 35 years and maximum age was 75 years with the mean of 50.57±9.023. Mother's minimum age was 30 years and maximum age was 45 years with the mean of 46.94±39.95.The minimum family income was 10000 Rs and maximum family father income was 180000

Rs with the mean income of 29698.11±22106.33. In 106 adolescent boys minimum weight was 42 kg and maximum weight was 95 kg with the mean of 59.88± 10.99. The minimum height was 32 inch and maximum height was 71 inch with the mean height of 61.26±6.92 inch. The minimum BMI calculated among our candidates was 17 and maximum BMI was 71 with the mean BMI of 25.96±9.46.In our study minimum MUAC was 8 inch and maximum MUAC was 13 inch with the mean MUAC of 9.18±1.13.

Height for Age

There were 90 [100%] of adolescent boys with normal BMI had change in sclera color. This difference was statistically significant (p<0.001) between normal and underweight adolescents. There were 97 [95.1%] adolescent boys with normal BMI had change in conjunctiva color in comparison to 5[4.9%] of underweight adolescent boys. This difference was statistically not significant (p=1.00)

Among 106 adolescents 56 [52.8%] were living in rural area while 50 [47.2%] were living in urban area. Among 106 adolescents 90 [84.9%] had their owned house while 16[15.1%] were living in rented house. Moreover, out of 106 adolescents only 4[3.8%] had non-constructed home while 102 [96.2%] had constructed home. Furthermore, 70[66] had nuclear family while 36 [34.0%] had extended family system.

Table 1: *Frequency of Stunted and Undernourished*

Height to Age Z score		
	Frequency	**Percentage**
Normal	58	45.3
Stunted	48	54.7
BMI to Age Z Score		
Normal	101	95.3
Undernourished	5	4.7
Stunted & Undernourished		
Normal	106	100
Stunted + Undernourished	0	0

BMI; Body Mass Index

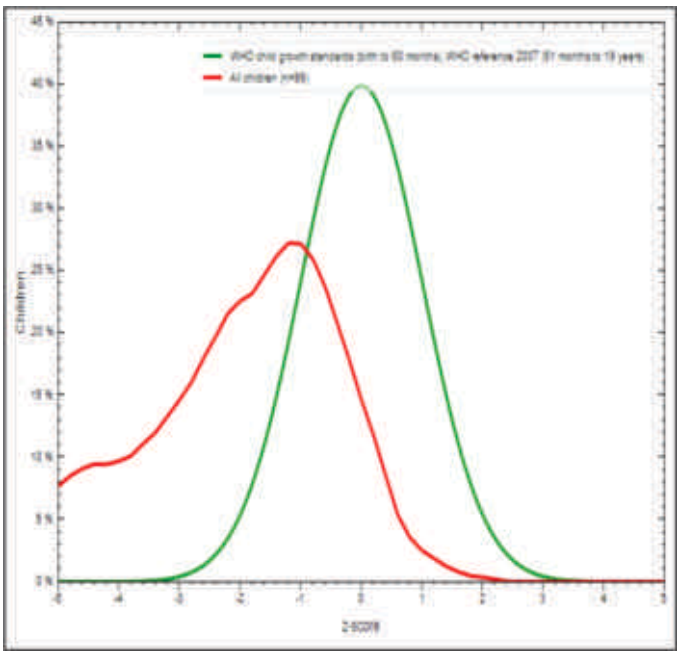
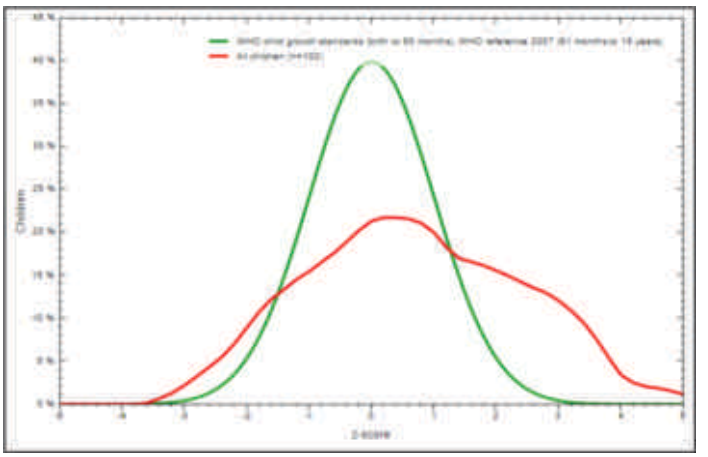


Table 2: *Characteristics of the subjects included in the study*

Variables	**Mean**	**Std. Deviation**	**Minimum**	**Maximum**
Age years	16.93	1.55	12.00	19.00
Father age	50.57	9.02	35	75
Mother age	46.94	39.95	30	45
Family income	29698.11	22106.63	10000	180000
Weight(KG)	59.88	10.99	42	95
Height	61.26	6.92	32	71
MUAC	9.18	1.13	8	13
BMI	25,96	9.46	17	71
HAZ	-2.36	2.16	-12.28	1.24
BAZ	0.94	2.08	-2.38	8.48

BMI; Body Mass Index, MUAC; Median Upper Arm Circumference, HAZ; Height to age Z-score , BAZ; Body Mass to Age Z-score

BMI for age



Discussion:

Adolescent form an important vulnerable and neglected

sector of the Pakistan population. Guidance, counseling and imparting nutrition education can improve the dietary behavior, which may further lead to promote sustainable development among adolescent. Prevalence of stunted and undernourished among 106 adolescents was associated with following factors; Family income, Medical condition, Demographic variables, Clinical condition and food consumption. Adolescent boys had no access to diverse and adequate food tend to be more malnourished. The effect of these determinants can be used to develop strategies for reducing malnutrition. Family income plays an important role because without money someone cannot buy food material and suffer from malnutrition. This study proved that adolescents with low family income have more chance for malnutrition as compared to those with high family income. In short, with increase in family income nutritional status improved. Therefore, Government should impose good strategy to improve family income by creating job opportunities in order to improve nutritional status of adolescents. Furthermore, a good environment plays an important role for healthy life and to maintain nutritional status of individual. In order to tackle the problem of malnutrition following strategies should adopt. Policies should be made to boost the parent's education status, especially mothers because it is association with adequate diet, care of the family and health seeking behavior. Boys should consume additional diet during adolescent for the prevention of malnutrition. Regular adequate and all variety of food should be available. Health education program should be held at community level to educate parents as well as students about the personal hygiene and proper diet to prevent the malnutrition. Policies should be made to boost the parent's education status. A good family income decreases the stunted rate in adolescent. Therefore, a good socioeconomic status is essential in order to reduce malnutrition status in adolescents.

Conclusion:

Study concluded that prevalence of stunted and undernourished among 106 adolescents was associated with following factors; Family income, Medical condition, Demographic variables, Clinical condition and food consumption. Adolescent boys had no access to diverse and adequate food tend to be more malnourished. The effect of these determinants can be used to develop strategies for reducing malnutrition.

References:

1. Gillespe S. Malnutrition in South Asia: a regional profile. In Malnutrition in South Asia: a regional profile 2012 (pp. 189-189).
2. Pradhan M, Guru P, Paital B. Daily Dietary Nutrition and Nutraceutical Intake in Agricultural Laborers of Hirakud Command Area, Sambalpur, Odisha, India. Journal of Drug Delivery and Therapeutics. 2019 Sep 15; 9(5):56-61.
3. Thatcher RW. Maturation of the human frontal lobes: Physiological evidence for staging. Developmental Neuropsychology. 1991 Jan 1; 7(3):397-419.
4. Amirthaveni M, Barikor CW. Nutritional status of the Meghalayan preschool children. Indian J Nutr Diet. 2002; 39:262-68.
5. Khan S, Zaheer S, Safdar NF. Determinants of stunting, underweight and wasting among children< 5 years of age: evidence from 2012-2013 Pakistan demographic and health survey. BMC public health. 2019 Dec; 19(1): 358.
6. Haji Faraji M, Esfarjani F, Roustaee R, Khoshfetrat M, Kamrani Z. Assessment of anthropometric status of adolescents in public guidance schools in East Tehran, 2006. Iranian Journal of Nutrition Sciences & Food Technology. 2007 Sep 15; 2(2):37-43.
7. Afsrjany F, Golestan B, Derakhshani K. Does teenage girls knowledge of the anthropometric and nutrition are desirable. Shahid Beheshti University of Medical Sciences Journal. 2006; 10(3):183-9.
8. AF A, AO A, MB F. Prevalence of Malnutrition and high blood pressure amongst Adolescent in Semi Urban Area of Ogun State South Western Nigeria. Nigeria Medical Practitioner. 2016; 69(6): 83-88.
9. NB T, GA B, SM A, ME Y. Prevalence and major contributors of child malnutrition in developing countries. Journal of childhood obesity. 2017; 2(4): 16.

Assessment of Quality of Life among Old Age Shelter Home dwellers in Lahore using WHO QOL-BREF, Pakistan

Sana Maqbool,[1] Surrya Jafar,[2] Maham Farooq,[3] Faisal Mushtaq[4]

Abstract

Nowadays, families are determined by globalization, urbanization & westernization. In accordance to this joint family system have been broken into extended family system that has led to the problem of solitude of elder persons in a family. In this, keeping in consideration, the elderly care, institutions like "Old Age Homes" have played an important role in different communities. This research was focused to conclude the quality of life and its connected elements among the older folks living in shelter homes in District Lahore using WHO-QOL BREF.

Material And Methods: This was a random sampling among 200 dwellers aged 60 years or above in randomly chosen shelter homes in District Lahore. Simple random sampling was used to choose participants. Study instruments were WHOQOL-BREF. Multidimensional scale for perceived social support and a questionnaire for Data collection were utilized during face to face interview. Quality of life was measured with the validated World Health Organization Quality of Life Instrument-Brief Version (WHOQOL-BREF). The evaluation of perceived quality of life was done using 26 items categorized into Physical domain (7 items), Psychological domain (6 items), Social relations domain (3 items), and Environment domain (8 items).

Results: The frequency(percentage) for life quality rated by old people living in old age accommodations was very poor 7(9.1%), poor 9(11.7%), neither poor nor good 37(48.1%) and good 24(31.1%).

Conclusion: The assessment of QOL of Old People gave us an understanding into physical health, social prosperity and psychological durability. These findings can help us to promote contentment of aged people, which will benefit the patients and society. As we did not know about the scenario of QOL of Old people living in shelter homes, therefore, we needed such statistics for policy making and planning for justifying targeting group.

Key Words: Elderly, old age homes, Pakistan, Quality of Life, WH0QOL, BREF

Introduction:

Nowadays, families are determined by globalization, urbanization & westernization. In accordance to this joint family system have been broken into extended family system that has led to the problem of solitude of elder persons in a family. In this, keeping in consideration, the elderly care, institutions like "Old Age Homes" have played an important role in different communities.

1. Govt, Tehsil Headquarter Hospital, Samanabad Multan
2. Institute of Public Health, Lahore

Correspondence:
Dr. Sana Maqbool, Govt, Tehsil Headquarter Hospital, Samanabad Multan

Submission Date: 00-00-0000
1st Revision Date: 00-00-0000
Acceptance Date: 00-00-0000

An extended family or a nuptial family is a family group consisting of two parents and their kids. It is in comparison to a single parent family and extended family also family with more than two parents. Small families typically rely on a married couple; the small family may have any number of children.[3]

The ignominious process of becoming old is the accomplishment of human life, as at this stage, human life is fragilee as per physical aspect, on other hand vulnerable and emotional on psychological perspectives.[4,5] They strive for more consideration from family members which is bit difficult to get as everyone is busy with their own lives. These circumstances make old aged people more sensitive to emotional disturbances. Old age thought out as a curse, being affiliated with deterio-

ration of all physical energies, psychological factors, and confinement from social, economic and other activities.[5,12] Due to fragile physique they tend to dependent on others. Moreover, fearful anticipations and thoughts of life processes makes them concerned, along with low income and sequential declining position in family and society cause them suffer further deep despair.[6,10]

The changes in family values, economic constraint of the children, neglect have resulted in elders to sideline from the net of family care. Shelter homes are ideal for elder people who are left unattended, facing health problems like depression and loneliness unfortunately.[7,9]

Western life style has built barriers, and time has become a very high priced commodity in this race of life leaving elderly unescorted. It is said that "A home is a heaven where elderly and younger ones are cared for".[8,11] This has made awareness to the concept of old age homes where their loved ones manage to find a middle ground.

The evaluation of life quality of old folks living in old age homes has increasingly become an important research area as we are not well aware about the current status of QOL of Old people living in shelter homes because no prior study has been conducted in Pakistan on this subject matter yet. Therefore, it is the need of hour to have such information during policy making and planning for justifying target group. So, this study had been planned to determine the QOL among elderly residing in old age homes to have an insight of their situation. The objectives of the study were to assess the quality of life using WHO-QOL BREF and associated factors among old people living in shelter homes of Lahore.

Material And Methods

This was a cross sectional study among 200 residents aged 60 years or above in randomly selected shelter homes in District Lahore. Simple random sampling was used to select participants. Study data were WHOQOL-BREF. Multidimensional scale for perceived social support and a questionnaire for Data collection were utilized during one o one interview. Quality of life tends to measure with the approved World Health Organization Quality of Life Instrument-Brief Version (WHOQOL-BREF). The evaluation of identify quality of life was done using 26 items categorized Psychological domain (6 items), Social relations domain (3 items), and Environment domain (8 items).

Results

Out of 77 old people that were included in the study 7(9.1%) rated their Quality of Life very poor, 9(11.7%) poor, 37(48.1%) neither poor nor good and 24(31.1%) good.

As far as Perception about Health is concerned, 7(9.1%) people's health was very poor, 13(16.9%) poor, 33(42.8%) neither poor nor good and 24(31.2%) Good.

Table 1: *Distribution of the old people by overall quality of life"*

Level of QOL	Frequency (n)	Percentage (%)
Very Poor	7	9.1%
Poor	9	11.7%
Neither Poor nor Good	37	48.1%
Good	24	31.1%
Total	77	100%

Table 2: *Distribution of the old people by perception about health"*

Perception of health	Frequency (n)	Percentage (%)
Very Poor	7	9.1%
Poor	13	16.9%
Neither Poor nor Good	33	42.8%
Good	24	31.2%
Total	77	100%

Discussion

The results have determined that there is certain need of alertness programs to foster better life style among the adults residing old age homes in Lahore, Pakistan. These results identified the lacking concerning the management issues of old age home. According to CDC (2015), Physical activities which include regular exercise, are effective in enhancing physical as well as and mental health conditions especially in old people. It would more likely to help in prevention from various cardiac conditions that are common in people aged 60 years or above. Moreover, it will assist them in keeping various common diseases like Diabetes and Hypertension in control. Old age Homes of Pakistan must impose various exercises and workout sessions depending on age, that will not only help them improve their physical health, but keep them engaged in mental activity as well.

The study recommended more improvements in shelter

homes in terms of safety, security and medication, awareness facilities. In accordance to gain desirable results for better QOL in shelter homes, adults should provide with healthy diet, teamwork, workout sessions interacting activities etc. Moreover, it is important to provide them an interactive environment that would improve their self-image & self-esteem.

Conclusion

This study concluded that although elderly participants were well aware of "Old Age Homes" in Pakistan but the vast majority does not feel protected in leaving their residence and living under same roof with strangers. However, "Old Age Homes" were a preferred choice for those with chronic diseases or those living alone.

Conflict of Interest None

Funding Source None

References

1. Pahwa P, Karunanayake CP, McCrosky J, Thorpe L. Longitudinal trends in mental health among ethnic groups in Canada. Chronic Diseases & Injuries in Canada. 2012 Jun 1;32(3).
2. Vickers NJ. Animal communication: when i'm calling you, will you answer too?. Current biology. 2017 Jul 24; 27(14):R713-5.
3. World Health Organization. WHOQOL-BREF: introduction, administration, scoring and generic version of the assessment: field trial version, December 1996. World Health Organization; 1996.
4. World Health Organization. WHOQOL-BREF: introduction, administration, scoring and generic version of the assessment: field trial version, December 1996. World Health Organization; 1996.
5. Barua A, Mangesh R, Kumar HH, Mathew S. A cross-sectional study on quality of life in geriatric population. Indian journal of community Medicine. 2007 Apr 1; 32(2): 146.
6. Poljičanin T, Ajduković D, Šekerija M, Pibernik-Okanović M, Metelko Ž, Mavrinac GV. Diabetes mellitus and hypertension have comparable adverse effects on health-related quality of life. BMC Public Health. 2010 Dec;10(1):1-6.
7. Jakobsson U, Hallberg IR. Loneliness, fear, and quality of life among elderly in Sweden: a gender perspective. Aging clinical and experimental research. 2005 Dec; 17(6):494-501.
8. Reijneveld SA, Spijker J, Dijkshoorn H. Katz'ADL index assessed functional performance of Turkish, Moroccan, and Dutch elderly. Journal of clinical epidemiology. 2007 Apr 1; 60(4):382-8.
9. McDaid O, Hanly MJ, Richardson K, Kee F, Kenny RA, Savva GM. The effect of multiple chronic conditions on self-rated health, disability and quality of life among the older populations of Northern Ireland and the Republic of Ireland: a comparison of two nationally representative cross-sectional surveys. BMJ open. 2013 Jun 1; 3(6):e002571.
10. Hickey A, Barker M, McGee H, O'Boyle C. Measuring health-related quality of life in older patient populations. Pharmacoeconomics. 2005 Oct;23(10):971-93.
11. Salaffi F, Carotti M, Stancati A, Grassi W. Health-related quality of life in older adults with symptomatic hip and knee osteoarthritis: a comparison with matched healthy controls. Aging clinical and experimental research. 2005 Aug;17(4):255-63.
12. Vitorino LM, Paskulin LM, Vianna LA. Quality of life among older adults resident in long-stay care facilities. Revista latino-americana de enfermagem. 2012; 20: 1186-95.
13. Soni RK, Porter AC, Lash JP, Unruh ML. Health-related quality of life in hypertension, chronic kidney disease, and coexistent chronic health conditions. Advances in chronic kidney disease. 2010 Jul 1;17(4):e17-26.
14. Jacob ME, Abraham VJ, Abraham S, Jacob KS. The effect of community based daycare on mental health and quality of life of elderly in rural south India: a community intervention study. International Journal of Geriatric Psychiatry: A journal of the psychiatry of late life and allied sciences. 2007 May;22(5):445-7.

Frequency of Dengue Fever among Febrile Children Aged 1-5 years presenting in Outpatient Department of Children Hospital Multan Using Ns1 ICT Kit

Ghulam Asghar Shah,[1] Tahir Mahmood,[2] Seenum Saeed,[2] Arif Mohyuddin[3]

Abstract

Objective: To find out the frequency of dengue fever among febrile children aged 1 to 5 years attended in children hospital Multan using NS1 ICT method and to assess effectiveness of surveillance teams.

Methods: It was a cross sectional hospital based study planned among 200 febrile children aged 1 to 5 years presenting at Children Hospital, Multan. NS1 ICT kit used to determine positivity of dengue fever. Data was entered, and analyzed using SPSS version 24.0. Means and standard deviation of central tendency were calculated for continuous data.

Results: Two children (1%) were found positive for dengue fever. There were 93 (46.5%) females and 107 (53.5%) were male children.148 (74%) suffered from fever since 3 days and remaining 51 (25.5%) patients suffered from fever since last four days. The mean age of the children was 2.42 ± 1.23 years, mean income of the families was 15027 ± 4811 rupees; mean temperature was 102.45 ± 0.573ºF, Among 200 houses, 143 (71.5%) had been visited by the dengue surveillance teams. 80 (40%) were trained; 64 (32%) had distributed literature regarding dengue prevention; mosquito knowledge was given by 125 (62.5%) teams, larva picture was shown only by 2 (1%) teams, potential sites knowledge was given by 135 (67.5%) teams.

Conclusion: Only 1% of febrile children were labeled as confirmed on the basis of NS1 ICT kit result.

Key words: Dengue Fever, NS1 ICT Kit, febrile Children, Dengue Surveillance Teams.

Introduction

In Pakistan dengue fever is endemic; occurring throughout the year with a highest incidence in the post-monsoon period.[1] Asymptomatic seropositive population is at great risk of developing hemorrhagic fever in an area which has experienced a pervious undetected outbreak of dengue fever. This is important because in most other prospective studies, secondary dengue infections were high in all patients who suffered from dengue fever and hospitalized due to its complication.[2]

Out of various variables, Age is a crucial variable in the incidence of dengue fever. Age limit of dengue patients in Pakistan has declined during 2003–2007 which leads to gradual increase in the number of children affected with dengue.[3] Risk of death in a child with a secondary dengue infection increases 15 times than in adults, most likely due to increased micro vascular permeability, a secondary dengue complications in seropositive children must be treated promptly to avert the risk of death.[4]

Reinfection with dengue is observed to be more severe in children due to immunological phenomenon. Presence of dengue IgM antibodies in blood sample is not very specific but is required to make a probable diagnosis of dengue. A study conducted by Abhishek and associates (2014) to assess clinico-pathological profile of dengue illness among children in Banglore, India. Fever was detected in all of 175 cases. Children who experienced clinical signs like fever , pain in abdomen, body pain, nausea and vomiting, rash, enlarged liver, bleeding from various body parts, pleural /abdominal effusion, their blood samples had high levels of IgG, IgM and NS1 Ag titres (p value was between 0.015 to 0.837 which was statistically significant).[5]

Dengue infection has been classified by WHO according to level of severity. Dengue patients are classified as severe or non-severe dengue patient. Patients who are

1. *Nishtar Hospital Multan*
2. *Institute of Public Health, Lahore*
2,3. *King Faisal University, AlHassa, KSA*

Correspondence:
Arif Mohyuddin, King Faisal University, AlHassa, KSA

Submission Date: 00-00-0000
1st Revision Date: 00-00-0000
Acceptance Date: 00-00-0000

classified as non-severe dengue are further divided into those with warning signs and those with non-specific symptoms or asymptomatic dengue infection. Severe disease could be developed in both kind of patients either with warning signs or with asymptomatic dengue infection.[6]

Around the world in 128 countries, it is estimated that 3.9 billion people are at risk of dengue infection.[7] This disease is manifested clinically in approximately 96 million people. Each year around 500,000 patients mostly children requires hospitalization.[8] This disease is most fatal when it comes in its severe forms –DHF and DSS.

Dengue virus has four different serotypes of the virus that cause illness that are DEN-V1, DEN-V2, DEN-V3, and DEN-V4. A fifth serotype was discovered in 2013.[9] Lifelong immunity is acquired against a specific serotype after getting infected with that specific serotype. There would be only partial or incomplete cross-immunity when infected by other serotypes. Primary infection is often self-limiting but secondary infection with different serotype increases the risk of severe disease. The serotype causing the secondary infection often determines the risk of severe disease.[10]

Severe dengue (DSS and DHF) could be a fatal disease. Most fatal sign is severe plasma leakage which leads to, bleeding manifestations, shock and multi organ damage.[11] Dengue fever progresses to severe dengue in only about 5% of cases and there are few risk factors that increase the likelihood of some children to suffer the severe illness.[12] There are three phases of severe dengue; each phase differs in body fluid status. Adequate fluid management is the prime key of severe dengue treatment.[13]

In most countries of the Indian subcontinent including Pakistan, Maldives, India and Sri Lanka, several dengue outbreaks have been reported. During these outbreaks, thousands of documented and undocumented cases are reported.[14] In past few decades DENV-2 and DENV-3 have been predominant in most of the outbreaks.[15] At present, no specific therapies or vaccines are available for treatment or prevention of dengue transmission[16] main features of dengue is fever and headache. There could be different atypical presentations of dengue fever. To diagnose and intervene timely is very important. For better management of dengue cases[17] integrated surveillance is required to detect and report early cases so prevention and control measures could be planned and execute timely. Continuous monitoring and evaluation are the main stay to ensure effectiveness.[18] These measures could avert the chances of large scale epidemics in future. Objective of this study was to find out the incidence of dengue fever among febrile children aged 1 to 5 years and to describe the indoor working of vector surveillance team in the houses of febrile children. This study also assessed the knowledge of parents about prevention of dengue fever.

Material and Methods

This was a cross-sectional study conducted in children hospital Multan. 200 Children 1 to 5 years of age with fever more than two days and less than 7 days were included in the study. Children having temperature >100ºC were labeled as Febrile. As per DEAG guidelines, 'suspected' cases of dengue fever are those patients who suffered from fever for more than 2 days along two of following symptoms: pain in muscles, pain in joints, retro-orbital pain, headache, skin rash, severe pain in abdomen, decrease in urinary output despite adequate fluid intake and bleeding manifestations. The suspected dengue fever cases patients with thrombocytopenia (platelet count <100,000 cells/µl) or a decreasing trend on blood count analysis with decline leukocyte were classified as 'probable' cases of dengue fever.[19,20] Convenient sampling technique was used. The sample size of the study was 155 children but for convenience 200 in the study were included with Confidence level of 95%.

DEAG Form-O (developed by the Dengue Expert Advisory Group) and a questionnaire were used as tools. In hospital a nurse performed NS 1 ICT test with whole blood. It is a rectangular cassette with an opening to add whole blood, serum, or plasma. There is a immunochromatographic membrane coated with NS1 antigen on the test line (T) and a window to view the result. The test is considered negative if only control line is visible. if lines C and T are visible, the result is positive; and when no line or only the T line was visible, the test result is invalid

Data was entered and analyzed using SPSS version 24.0. Frequency tables were generated for gender, age, family income, number of fever days. Means and standard deviation of central tendency were calculated for continuous data. To find out association between categorical variables t- Test was applied.

Results:

Among 200 febrile children only two (1%) were tested positive for NS1 ICT kit and remaining 198 (99%) were

negative. (Table 1). There were 93 (46.5%) females and 107(53.5%) were male children. The mean age of the children was 2.42 ± 1.23 years, mean income of the families was 15027± 4811 rupees; mean temperature was 102.45±0.573ºF (Table 2) Among 143 teams, there were142 (99.3%) times team introduced themselves, 138 (96.5%) of the teams wear their uniforms. 139 (97%) of the members had wear their cards, 118 (82.5%) had their employee cards with them, only 7(4.9%) had taken lens with them. None of the teams had dipper, larvicide or beaker. 118 (82.5%) had entered the houses, 103(72%) had checked houses for the larvae, none of the times they had found any larvae. During checking of various potential spots of breeding in houses for dengue larvae, gutter was present in 198 (99%) of the houses and only 23 (11.5%) had been checked by the team. Plant pot was present in only 1 house and it was not checked by the team, bird water pot was also present in 1 house and it was also not checked, animal water pot was present in 2 houses and was left unchecked by the team. Waste bin was checked in 57(28.7%) of the houses among 198 houses in total having waste. Leaking tap was present in 21 (10.5%) homes and amongst them 13 (61.9%) were checked. Air conditioner drainage was found in 20 (10%) houses while 11(55%) had been checked, desert cooler was present in 11 (5.5%) houses and nothing of them was checked, tray of fridge was present in 171 (85.5%) houses and only 69 (40.3%) were checked, water storage pot was present in 25 (12.5%) houses and amongst them 32% (8) were checked and overhead water tank without cover was found in 3 (1.5%) houses while only 2 (66.7%) were checked for larvae presence. Regarding teams giving knowledge to households, 80 (40%) were trained; household members satisfied from teams were 52 (26%); for 64 houses (32%) team had distributed literature regarding dengue prevention; mosquito knowledge was to 125(62.5%) houses teams, larva picture was shown only to 2(1%) houses' potential sites knowledge was given to 135(67.5%) houses, regular checking of larvae was told to111(55.5%) houses, checking of houses by themselves was done by 127 (63.5%) households. Awareness about dengue prevention measures was good among respondents. 188 (94%) had knowledge about mosquito bite time, full sleeve wearing is the prevention known to 196(98%) households, net for mosquito prevention was known to 195 (97.5%), mospel usage to also prevent from dengue was known to 192 (96%) and screen doors and windows must be installed for prevention was known to 40 (20%) households. (Table 3). About gender of the children, among 93 females (1.1%) was found positive for NS1 ICT kit and among 107 males (1%) was positive.

In this study 62.5% had knowledge about larva sites and mosquito. This study suggested a good level of performance of dengue team (71.5%). General public showed only little adequate knowledge (26%) but awareness of protective measures was high (>90%).

Table 1: *Dengue positivity using NS1 ICT KIT among children attending Children Hospital Multan*

Dengue Fever	Frequency	Percentage
Positive	02	1
Negative	198	99
Total	200	100

Table 2: *Socio-demographic characteristics and physiological factor of respondent examined for dengue fever using NS 1 ICT KIT*

Variables		Frequency	Percentage
Sex	Males	107	53.5
	Females	93	46.5
Fever Days	2-3	149	74.5
	4 and above	51	25.5
Total		200	100
Variable		**Mean ± SD**	
Age (years)		2.42±1.23	
Family Income (Rupees)		15027±4811	
Temperature (ºF)		102.45±0.573	

Table 3: *Frequency distribution of respondent regarding awareness about dengue related fever and transmission (n = 200)*

Have knowledge	Yes		No	
	Frequency	Percentage	Frequency	Percentage
about dengue mosquito sites	188	94	12	06
about dengue mosquito bite time	188	94	12	06
about benefits of full sleeve dressings	196	98	04	02
about net usage	195	97.5	05	2.5
about Mospel Usage	192	96	08	04
about Screen Doors and Windows	40	20	160	80

Discussion

Data related dengue fever in children is not available in Pakistan and that data which is collected is expert opinion and not on scientific base. This study was conducted at children hospital Multan and out of 200 febrile patients there were only 2 children found positive on NS1 ICT kit. This study would help in determining incidence of dengue fever in children for future reference. It would also determine performance of dengue surveillance teams and awareness in public regarding dengue infection. Awareness level was high regarding use of any measure of protection because majority of respondents in this were literate, of middle class and young. In this study mosquito knowledge was found in 62.5%, larva sites knowledge was 67.5% and regular checking information was55.5%. Findings regarding knowledge were consistent with finding of various other studies. During raining season Dengue fever spreads widely through mosquitoes bite especially Aedes Aegypti and Aedes Albopictus. Dengue vector control requires community participation. Effective vector control surveillance through trained staff can overcome dengue outbreaks timely. Concerned District Health Authorities should ensure that spray teams have been activated in all towns before rainy seasons to combat with mosquitoes and larvae. Awareness about mosquito as a vector was 94% in our study. Knowledge about protective measures in this study was wearing full sleeve shirt (98%), use nets while sleeping (97.5%), use mosquito repellent oils (96%) these findings are consistent with other studies. Low cost methods were more preferred and no methods like checking coolers or flower pots for mosquito breeding, discarding waste items that can hold water were less checked because of poor knowledge about them. Dengue is a fatal viral disease which spreads through a mosquito Hundreds of lives and millions of rupees lost through this disease. More than hundred countries are facing this disease and trying to overcome. Sensitivity and specificity tests are mainly required for accurate laboratory diagnosis of DENV-infected patients. Sensitivity of the NS1 ELISA test amounted to 66.6% and sensitivity of the rapid NS1 antigen amoun-ted to 55.5%; of these, the ELISA technique appears to be a more sensitive method. As this study is hospital based and on convenient non probability sampling, its limitation cannot be ignored same is the case with cross-sectional study. Follow up was not possible due to cross sectional nature of the study.

Table 4: *Comparison of socio-demographic characteristics and physiological factor among respondent examined for dengue fever*

Variable	Dengue Fever		t Test value	p value
	Positive	Negative		
	Mean±SD	Mean ± SD		
Age (Years)	2.48 ± 2.13	2.42 ± 1.23	-0.071	0.944
Fever (Days)	3.5 ± 0.71	3.25 ± 0.44	-0.797	0.427
Temperature (ºF)	102 ± 1.41	102.45 ± 0.56	0.454	0.728
Income (Rupees)	8000±7071	15348.5±4753.3	2.169	0.031*

*Significant p-value

Conclusion

On the basis of NS1 ICT kit result only 1% of febrile children were labeled as confirmed. The total 200 children presenting at institute of child health, Multan were fitted into the diagnosis of suspected dengue using DEAG designed O form. The surveillance teams did good coverage of the catchment area as 71.5% of the respondent agreed that team could visit their homes. The respondents were asked about their knowledge about Dengue. The teams were having adequate knowledge and training. None of the team related factors or knowledge has significant association with results from NS1 ICT kit. These members were almost having identity cards and proper uniform. In fact, there is acute shortage of the workers in the field. The indoor teams spend less time inside the house. Preventive measures can greatly reduce the risk of dengue spread. Proper checking of all the breeding places by trained surveillance teams will certainly ensure the increase in effectiveness of the surveillance. Dengue corner should be present at basic unit levels, also, so that suspected patients could be reported immediately. Integrated vector control program should be strengthe-ned and schools teaching staff should be involved as it is noted that most of the people got knowledge through their school going children. The maximum population should be covered by the LHWs. Surveillance teams should visit all sectors of the society such as school teachers, religious leaders and community leaders to encourage their and their people's participation in dengue control program. Health department should take active necessary steps to make people aware of dengue disease and its prevention

Conflict of Interest None

Funding Source None

References

1. Fatima Z, Idrees M, Bajwa MA, Tahir Z, Ullah O, Zia MQ, Hussain A, Akram M, Khubaib B, Afzal S, Munir S. Serotype and genotype analysis of dengue virus by sequencing followed by phylogenetic analysis using samples from three mini outbreaks-2007-2009 in Pakistan. BMC microbiology. 2011 Dec 1; 11(1):200.
2. Sangkawibha N, Rojanasuphot S, Ahandrik S, Viriyapongse S, Jatanasen S, Salitul V, Phanthumachinda B, Halstead SB. Risk factors in dengue shock syndrome: a prospective epidemiologic study in Rayong, Thailand: I. The 1980 outbreak. American journal of epidemiology. 1984 Nov 1; 120(5): 653-69.
3. Khan E, Kisat M, Khan N, Nasir A, Ayub S, Hasan R. Demographic and clinical features of dengue fever in Pakistan from 2003–2007: a retrospective cross-sectional study. PloS one. 2010; 5(9): e12505.
4. Herrera-Basto E, Prevots DR, Zarate ML, Silva JL, Sepulveda-Amor J. First reported outbreak of classical dengue fever at 1,700 meters above sea level in Guerrero State, Mexico, June 1988. The American journal of tropical medicine and hygiene. 1992 Jun 1; 46(6):649-53.
5. Abhishek M, Devi GM, Jyotirmanju, Rau ATK. Clinico pathological profile of dengue like illness in children A prospective study. Int J Curr Microbiol App Sci (2014) 3(2): 596-600.
6. Raheel U, Faheem M, Riaz MN, Kanwal N, Javed F, Qadri I. Dengue fever in the Indian subcontinent: an overview. The Journal of Infection in Developing Countries. 2011; 5(04):239-47
7. Rose W, Jacob JE, Adhikari DD, Verghese VP. Dengue illness in children. Current Medical Issues. 2017 Apr 1; 15(2):95-105.
8. Brady OJ, Gething PW, Bhatt S, Messina JP, Brownstein JS, Hoen AG, et al. refining the global spatial limits of dengue virus transmission by evidence-based consensus. PLoS Negl Trop Dis 2012; 6: e1760.
9. Normile D. Tropical medicine. Surprising new dengue virus throws a spanner in disease control efforts. Science 2013; 342:415-19.
10. Sangkawibha N, Rojanasuphot S, Ahandrik S, Viriyapongse S, Jatanasen S, Salitul V, et al. Risk factors in dengue shock syndrome: A prospective epidemiologic study in Rayong, Thailand. I. The 1980 outbreak. Am J Epidemiol 1984; 120:653-69.
11. World Health Organization and the Special Programme for Research and Training in Tropical Diseases (TDR). Dengue: Guidelines for Diagnosis, Treatment, Prevention and Control. Geneva, Switzerland:First edition. A Joint Publication of the World Health Organization (WHO) and the Special Programme for Research and Training in Tropical Diseases (TDR); 2009. Available from: http://www.apps.who.int/iris/bitstream/10665/44188/1/9789241547871_eng.pdf. [Last accessed on 2020 Mar 02].
12. Wilder-Smith A, Schwartz E. Dengue in travelers. N Engl J Med 2005; 353:924-32.
13. Vijayalakshmi AM, Jayavardhana A. Febrile rash and convalescent rash of dengue fever. Indian Pediatr 2013; 50:717-20
14. Mathew, A, Rothman, AL. Understanding the contribution of cellular immunity to dengue disease pathogenesis. Immunological Reviews 2008; 225: 300-13.
15. Raheel U, Faheem M, Riaz MN, Kanwal N, Javed F, Qadri I. Dengue fever in the Indian subcontinent: an overview. The Journal of Infection in Developing Countries. 2011; 5(04):239-47.
16. Rigau-Pérez JG, Clark GG, Gubler DJ, Reiter P, Sanders EJ, Vorndam AV. Dengue and dengue haemorrhagic fever. The Lancet. 1998 Sep 19; 352 (9132):971-7.
17. Majeed IA, Avabratha KS, Gowda LR, Syeda S. Clinico-haematological profile of dengue in children: a hospital based study. Int J Contemp Pediatr. 2017 Jul; 4(4):1340-4.
18. Mayxay M, Cui W, Thammavong S, Khenasakhou K, Vongxay V, Armstrong G, et al. Dengue in peri-urban Pak-Ngum district, Vientiane capital of Laos: a community survey on knowledge attitude and practices. Bio Med Central Public Health 2013; 13: 434.
19. Hamed MH. Hematological changes among children with dengue fever in Saudi Arabia. The Egyptian Journal of Haematology. 2017 Oct 1; 42(4): 129-33
20. Adedayo F, Nioma I, Olanrewaju MB, Adeyinka A, Ebele A. Serological evidence of recent dengue virus infection among febrile children in a Semi Arid zone. American J Infect Dis. 2013 Jan 1; 9(1):7-11

The Assessment of Acute Flaccid Paralysis Surveillance System of District Lahore, First Three Quarters Year 2019, Pakistan.

Arsalan Ahmed,[1] Saima Ayub,[2] Ayub Ali,[3] Faisal Mushtaq[2]

Abstract

The Acute flaccid paralysis surveillance is a strategy employed by the Global Polio Eradication Initiative in order to measure progress towards reaching the goal of polio eradication.1 Surveillance visits to health sites are conducted to ensure that all children less than 15 years of age with acute flaccid paralysis are detected in specific time period, followed by adequate stool specimen collection and testing for presence of poliovirus in WHO-accredited laboratories.2 The quality of A.F.P surveillance is monitored and evaluated by using standardized surveillance quality indicators.3

Material and Method: This was a cross sectional study, conducted in District Health Authority, Lahore using WHO protocol. The sample size was 384 and data was analyzed using SPSS version 24.0.

Results: The non-polio AFP rate for District Lahore is 10.7. Four cases of Wild polio virus were detected. The number of AFP cases notified within one week of onset of paralysis for is 319 (83%). The numbers of cases investigated within 48 hours of reporting were 382 (99%). Adequate stool samples were collected from 340 cases out of 384 (89%). The non-polio EV isolation from adequate stool samples of AFP cases was 11%. Regarding Environmental surveillance, 54 samples were collected among which 48 samples were positive for Wild polio virus. EPI card was found in 65 (16.9%) of the AFP cases.

Conclusion: The AFP surveillance system of District Lahore is sensitive enough, to detect all chains of WPV as it detected "Four" human polio cases.

Key Words: Acute Flaccid Paralysis, Surveillance, Poliomyelitis.

Introduction

The Global Polio Eradication Initiative started in the year 1988, followed by a unanimous resolution passed by all W.H.O member states in favor of global polio eradication. During the World Health Assembly session in 1988, 125 countries still reported endemic cases of poliomyelitis worldwide.[4] Among all the six WHO regions, four regions, which comprise of more than 80% of the world's populace, have been declared as polio-free already.5 Only three countries have not ceased to curtail polio cases due to wild poliovirus type 1 which include Nigeria, Pakistan and Afghanistan.[6] Since its inception, Surveillance is the modus operandi for detection of polio virus transmission and monitoring of results of all activities pertaining to eradication respectively.[7]

The four pillars of polio eradication are:

a. Routine Immunization
b. Supplementary Immunization Activities
c. Acute Flaccid Paralysis surveillance
d. Targeted Mop-up Campaigns.8

AFP surveillance comprises of case detection, case reporting and case investigation of all cases with a suspicion of A.F.P, data collection from reporting sites, data analysis and it's usage for action, reports, findings, feedback and rectification measures accordingly.[9]

Ten basic indicators are currently in use by the polio eradication initiative program for monitoring and evaluation of A.F.P surveillance system and laboratory performance based on good practices in A.F.P surveillance and polio eradication globally. These include, firstly,

1. Blood Transfusion Officer, Multan
2. Institute of Public Health
3. King Faisal University, AlHassa, KSA

Correspondence:
Arsalan Ahmed, Blood Transfusion Officer, Multan

Submission Date: 00-00-0000
1st Revision Date: 00-00-0000
Acceptance Date: 00-00-0000

the non-polio A.F.P rate per 100,000 children, whose target is at least two cases per 100,000 children less than age of 15 years, secondly, the target is more than 80% of all stool specimens collection from all A.F.P cases labelled as adequate cases, the number of cases with complete 60 day follow up to look for residual paralysis, with a target of >80%, and the target of >90% in the timeliness and completeness of zero reporting, alongwith the number of A.F.P cases which are investigated within time span of 48 hours after case notification as >80% and the number of stool specimens which arrive in laboratory within 72 hours of collection/dispatch to be ≥ 80%, moreover, the number of "good" condition specimens coming to lab as ≥ 80%, furthermore, the number of stool specimens with positive viral results dispatch back within four weeks post arrival as ≥80 % and lastly, the isolation of non-polio enteroviruses known as the E.V isolation from the stool specimens as 10%.

This study was conducted to check the efficiency and effectiveness of the AFP Surveillance system in District Lahore after calculating the indicators and to correlate its findings to pinpoint the hiatus in surveillance if any, which would help the stakeholders involved in Polio eradication initiative to do the needful corrective measures.[10]

Material and Methods

The study design was cross sectional. The study setting was District Health Authority, Lahore. The sample size was 384.

All the patients who were reported as A.F.P cases for the first three quarters of year 2019 were included as part of study including both male and female patients. The children less than 15 years of age, with acute, sudden onset of flaccid paralysis and came under the case definition of Suspected or Probable or Confirmed cases of Poliomyelitis/A.F.P. After permission from the concerned authorities and ethical committee, the evaluation of A.F.P Surveillance System of District Lahore was done by using WHO protocols for assessment of indicators of AFP surveillance.

Data analysis was done. The inferences were drawn as per the guidelines in the tool. Data was entered, cleaned and analyzed using SPSS version 24.0. Frequency tables were generated for all possible variables. Means and other parameters of central tendency were calculated for continuous data. Chi Square was applied to find out association between categorical variables. Means were compared using student's t test or ANOVA where applicable. Bar and pie diagrams were used to present categorical data whereas Line, Histogram, Scatterplot and Boxplot were used for continuous data. Odds Ratio along with 95% CI was calculated for various variables followed by Logistic Regression to adjust the values.

Results

In year 2019, total 384 A.F.P cases were reported. The non-polio A.F.P rate for District Lahore is 10.7. There were 319 (83%) A.F.P cases were notified within seven days / one week of onset of paralysis in District Lahore. The analysis of AFP cases reported after 7th day of onset of paralysis for first three quarters of year 2019 tehsil wise is as follows, Allama iqbal town had 18 cases, Aziz bhatti town had 3 cases, Cantt had 4 cases, Data gunj bux town had 6 cases, Gulberg had 1 case, Nishtar town had 8 cases, Ravi town had 8 cases, Samanabad town had 12 cases, Shalimar town had 10 cases and Wahga town had 4 cases as late notified cases respectively.

Out of total 74 late notified cases, 10 cases were reported on 1st contact, 24 cases were reported on 2nd contact, 25 cases were reported on 3rd contact, 9 cases were reported on 4th contact and 6 cases were reported on 5th contact and more. (See Table no 1).

The total inadequate cases were 54 with age range from 4-168 months. 12 twelve adequate cases died before the process of stool collection. According to provisional diagnosis, 43 among them were good AFP cases. 44 of them were missed by 1st contact with Health care provider. (See Table no 2).

Regarding timeliness and completeness of contact sampling of inadequate cases tehsil wise, Allama iqbal town had 14 cases eligible where number of samples were 42, timeliness was 79% and completeness was 100%. Aziz bhatti town had 2 inadequate cases where number of samples was 6, timeliness was 100% and completeness was 100%.Cantt had 2 cases where number of samples was 6, timeliness was 100% and completeness was 100%. Data Gunj Baksh town had 4 cases eligible where number of samples were 12, timeliness was 42% and completeness was 100%.Gulberg town had 1 inadequate case where number of samples was 3, timeliness was 100% and completeness was 100%. Nishtar town had 8 cases where number of samples was 24, timeliness was 63% and completeness was 100%. Ravi town had 2 cases eligible where number of samples were 6, timeliness was 50% and completeness was 100%.Samanabad town had 6 inadequate cases where

number of samples was 18, timeliness was 83% and completeness was 100%.Shalamar town had 9 cases where number of samples was 27, timeliness was 100% and completeness was 100%.Wahga town had 2 cases eligible where number of samples were 6, timeliness was 50% and completeness was 100%. (See Table no 3).
Regarding Environmental surveillance, both collection and lab results of District Lahore for first three quarters of year 2019, total 54 samples were collected till week 37. 48 samples were positive for WPV 1 (Wild polio virus type 1), 13 samples showed presence of non-polio EV isolation and 32 samples had Sabin like SL isolation in results from N.I.H Laboratory.(See Figure no 4).
The numbers of reported A.F.P cases according to age categories in months were as 8 in 1-5 months, 20 in 6-11 months, 133 in 12-35 months, 70 in 36-59 months, 122 in 60-119 months, 28 in 120-143 months and 32 cases in 144-179 months range for first three quarters of year 2019 respectively. (See Figure no 5).
Regarding AFP Environmental surveillance indicators in drainage union councils, the results were, the expected number of cases were 44, reported AFP cases were 129, non-polio AFP rate was 14.2 with age range from 6-179 months among which 56 were male & 73 were of female gender. The good AFP cases were 54%, the notification within 7 days was 82%, stool adequacy was 88% and NPEV isolation was 11%. (See Table no 6).

Discussion

The overall objective was to rapidly assess performance of the current A.F.P surveillance system in reporting A.F.P cases from the general and special population groups. This study helped to conclude that the A.F.P surveillance system is sensitive enough to detect an outbreak at an early stage. It helps in monitoring and evaluation of disease in terms of time, place and person by epidemiological experts and leads to provision of vital information for further necessary action to curtail the menace by stakeholders. Though all the indicators are above the set international standards, which portray an optimum A.F.P surveillance system in place, but unfortunately, making Pakistan, a polio free country still seems a distant dream and it needs a multipronged approach to eradicate polio from its soil.
After a structured review of all indicators, including desk analysis of all the relevant documents, it was evident that the A.F.P surveillance system is working as per the acceptable approved standards.
A study conducted in Ghana by Odoom JK et al stressed on the importance of the role played by the AFP Surveillance System in making the country Polio free. Our study showed that AFP Surveillance system of Lahore is simple, flexible, efficient, sensitive and acceptable to the people in contrast to the AFP Surveillance system of Zimbabwe which is though acceptable but more complicated and costly and less sensitive.[11]
Similar findings from another study by Macama A et al. Gambo Aliyu and colleagues showed that an approach to eradicate polio in Northern Nigeria is by engaging Muslim clerics in influencing community perceptions. Pakistan along-with Nigeria is among the three remaining countries which are still endemic for polio.[12]
A study conducted on the Surveillance system of Nigeria by Bassey BE and co-authors showed that the surveillance is at optimum level. Regarding performance, some challenges in the cold chain system, the continuation and sustained AFP case detection, prompt investigation and response constraints exist respectively.[13]
In China, which remains polio free for greater than 10 years, an epidemic arose in Xinjiang Uygur Autonomous Region China in 2011 after the importation of wild poliovirus (WPV) beginning from neighboring Pakistan.[14]
In Ghana, the latest case of native wild poliovirus was recorded in 1999, however it endured two more episodes in 2003 and 2008. With the help of W.H.O recommendations, spread of virus was hindered through high routine vaccination with exposure of live-constricted oral polio vaccine (OPV), supplementary immunization activities (SIA) and operational acute flaccid paralysis (AFP) surveillance.
AFP surveillance is one of the four major strategies of the Polio Eradication Initiative. Pakistan has a well-functioning and sensitive AFP surveillance system at all levels. The information received through AFP surveillance in Pakistan continues to lead decisions for conducting Supplemental Immunization Activities (SIAs) and ensure rapid response to outbreaks, facilitates focused vaccination strategies, leading to the interruption of wild poliovirus transmission.[15] The AFP Surveillance System in Lahore is well organized and is important for priority setting, planning, resource mobilization and allocation; prediction and early detection of epidemics; monitoring and evaluation of disease prevention and case response activities. AFP surveillance is thus a vital part of the PEI, providing crucial information to guarantee cost effective health strategies.

Figure No 4. *"Environmental Surveillance – Sample Collection & Lab Results"*

Figure No 5. *"AFP Case Distribution By Age Group"*

Table 1: *"Contact Wise Analysis of AFP Cases Reported After 7th Day of Onset of Paralysis"*

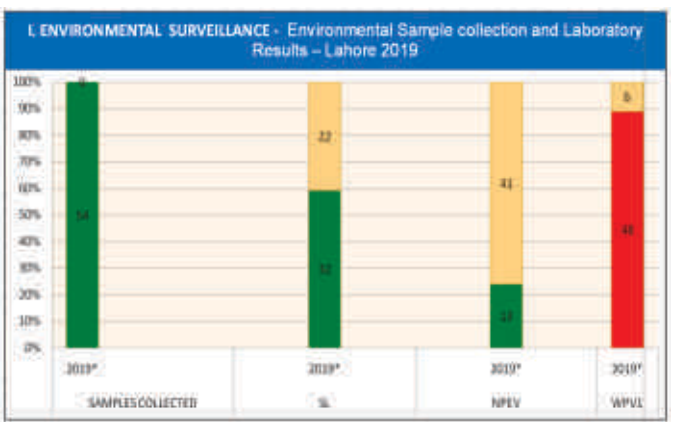
Town of Lahore	Late Notified Cases	Cases Reported on 1st Contact	Cases Reported on 2nd Contact	Cases Reported on 3rd Contact	Cases Reported on 4th Contact	Cases Reported on ⩾5th Contact
Allama Iqbal Town	18	2	5	6	3	2
Aziz Bhatti Town	3	-	2	-	-	1
Lahore Cantt.	4	2	-	2	-	-
Data GunjbuxTown	6	1	1	2	-	2
Gulberg	1	-	-	-	1	-
Nishter Town	8	1	2	5	-	-
Ravi Town	8	1	3	2	1	1
Samanabad Town	12	2	4	3	3	-
Shalimar Town	10	1	4	4	1	-
Wahga Town	4		3	1	-	-
	74	**10**	**24**	**25**	**9**	**6**

Table 2: *"Summary of Inadequate Cases 2019"*

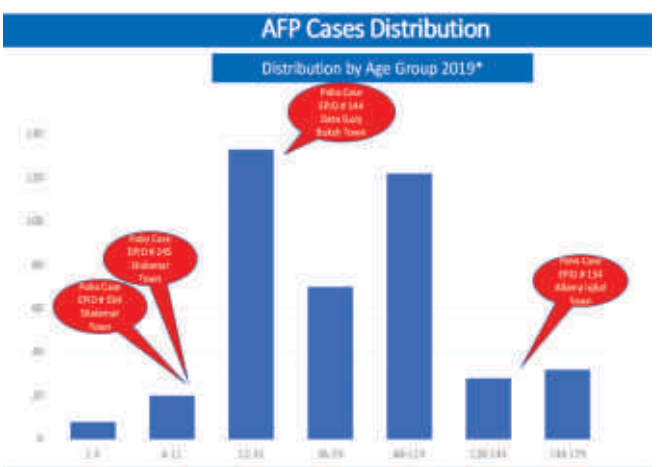
Total Cases		**54**
Age Range		4-168
Adequate Cases died before stool collection.		12
Good AFP Cases		43 (According to Provisional Diagnosis)
Missed by 1st contact		44
Missed by	**GPs**	14
	Hospitals	22
	TH / IHCP	8
	Physiotherapist	0

Table 3: *Stool Sample Collection Timeliness & Completeness of Contact Sampling of Inadequate Cases"*

TIMELINESS & COMPLETENESS OF CONTACT SAMPLING OF INADEQUATE CASES					
Year	**Tehsil**	**Inadequate cases eligible for sampling**	**Number of samples**	**Time-liness**	**Comple-teness**
2019	Allama Iqbal	14	42	79%	100%
	Aziz Bhatti	2	6	100%	100%
	Cantt.	2	6	100%	100%
	Data Gunjbux	4	12	42%	100%
	Gulberg	1	3	100%	100%
	Nishter	8	24	63%	100%
	Ravi	2	6	50%	100%
	Samanabad	6	18	83%	100%
	Shalimar	9	27	100%	100%
	Wahga	2	6	50%	100%
	LAHORE	**50**	**150**	**77%**	**100%**



Conclusion



The AFP surveillance system of District Lahore is sensitive enough, working effectively and efficiently to detect all chains of WPV as it detected "Four" human polio cases while possibility of more human polio cases cannot be ruled out.

The persistent WPV circulation since June 2018, Four

Table 4: *AFP Surveillance Indicators In Drainage Union Councils"*

INDICATORS		2019*
Expected # of AFP cases		44
Reported AFP Cases		129
Non Polio AFP Rate		14.2
Age range		6-179
Gender Distribution	**Male**	56
	Female	73
Notification within 7 days		82%
Stool adequacy		88%
NPEV isolation		11% (3.6% SL)
Good AFP cases		54%

human polio cases, <80% notification in Allama iqbal, Shalamar & Samanabad towns, <10% NPEV isolation in Aziz bhatti, Wahga, Gulberg, Ravi town, Shalamar & Data Gunj baksh town's, Still missed children, High risk UC's and Human resource issues are the specific challenges to surveillance network which need to be addressed. All AFP surveillance indicators for first three quarters of the year 2019 were well above the standards set by W.H.O.

References

1. World Health Organization. Forty-first World Health Assembly Geneva, 2-13 May 1988. WHA41. 28 Global eradication of poliomyelitis by the year 2000.
2. Marx A, Glass JD, Sutter RW. Differential diagnosis of acute flaccid paralysis and its role in poliomyelitis surveillance. Epidemiologic reviews. 2000 Jan 1; 22(2): 298-316.
3. World Health Organization. WHO vaccine-preventable diseases: monitoring system: 2009 global summary. World Health Organization; 2009.
4. Mondiale de la Santé O, World Health Organization. Polio surveillance: tracking progress towards eradication, worldwide, 2014–2015. Weekly Epidemiological Record= Relevé épidémiologique hebdomadaire. 2016 Apr 15;91(15):193-202.
5. World Health Organization. Acute flaccid paralysis surveillance: a global platform for detecting and responding to priority infectious diseases. Weekly Epidemiological Record= Relevé épidémiologique hebdomadaire. 2004;79(48):425-32.
6. Patel JC, Diop OM, Gardner T, Chavan S, Jorba J, Wassilak SG, Ahmed J, Snider CJ. Surveillance to track progress toward polio eradication—worldwide, 2017–2018. Morbidity and Mortality Weekly Report. 2019 Apr 4;68(13):312.
7. Initiative GP. Global polio surveillance action plan, 2018–2020. Geneva: Global Polio Eradication Initiative. 2019.
8. Modlin JF. The bumpy road to polio eradication. New England Journal of Medicine. 2010 Jun 24; 362(25): 2346-9.
9. World Health Organization. Global Polio Eradication Initiative: Polio Eradication and Endgame Strategic Plan (2013–2018). Geneva, 2013; Report No. WHO/POLIO/13.02;.
10. Global Polio Eradication Initiative. Standard Operating Procedures: responding to a poliovirus event or outbreak. World Health Organization, Global Polio Eradication Initiative, Geneva, Switzerland. 2017.
11. Obese-Djomoah E, Obodai E, Gberbi E, Duker EO, Attiku K, Eshun M, Boahene B, Nuvor SV, Odoom JK. Environmental surveillance of poliovirus in four districts within two regions of Ghana. medRxiv. 2022 Jan 1.
12. Saleem M, Haider I, Ajmal F. Audit and Evaluation of the Acute Flaccid Paralysis Surveillance System in Khyber Pakhtunkhwa, PAKISTAN. Khyber Medical University Journal. 2016 Dec 1; 8(1).
13. Akinyemi OO, Adebayo A, Bassey C, Nwaiwu C, Kalbarczyk A, Fatiregun AA, Alonge OO, Owoaje E. Assessing community engagement in Nigeria polio eradication initiative: application of the Consolidated Framework for Implementation Research. BMJ open. 2021 Aug 1;11(8):e048694.
14. Luo HM, Zhang Y, Wang XQ, Yu WZ, Wen N, Yan DM, Wang HQ, Wushouer F, Wang HB, Xu AQ, Zheng JS. Identification and control of a poliomyelitis outbreak in Xinjiang, China. New England Journal of Medicine. 2013 Nov 21;369(21):1981-90.
15. Global Polio Eradication Initiative. Standard Operating Procedures: responding to a poliovirus event or outbreak. World Health Organization, Global Polio Eradication Initiative, Geneva, Switzerland. 2017.

Assessment of Blood Transfusion Safety Mechanism in Public and Private Sectors Blood Banks of Sargodha City

Zil-e-Hassan,[1] Rukhsana Hameed,[2] Asma Ali,[3] Summia Khan[2]

Abstract

Blood transfusion is a lifesaving intervention. Safe blood transfusion is important because of widespread cases of hepatitis B, C and HIV/AIDS. To determine the safety blood transfusion mechanisms and socio-demographic profile of donors from the blood banks of public and private sector in Sargodha.

Material and Methods: A cross sectional study was planned among four blood banks from Sargodha city (02 public and 02 private). 100 donors (25 each) were collected from these blood banks and then information was collected through a questionnaire. Data was entered, cleaned and analyzed using SPSS version 24. Means and other parameters of central tendency were calculated and frequency tables were generated

Results: Age of the respondents showed that the Mean ± SD was 24.84±6.54 years. Regarding blood group, 37% donors had O, 36% had B, 18% had group A and 9% had AB blood group. Out of 100 donors, 85% had positive Rh factor and remaining had negative Rh factor. Thirty two donors had donated blood previously. No donor suffered from heart, lung, kidney, allergic disease, familial diseases, tuberculosis, cancer and sexually transmitted diseases whereas 06 of the donors suffered with malaria and hepatitis B or C.

Conclusion: It is concluded that Public & Private blood banks of Sargodha city were following all the procedures and rules. The staff was trained and most of the important screening tests were done for the blood donors.

Mostly donors have O blood group and positive Rh factor.

Key words: Blood donor, ABO blood groups, Blood Banks.

Introduction

Blood is a vital healthcare resource which is used in a wide range of hospital procedures, viz. accidents, emergency obstetric services, and other surgeries.[1] Every second, someone in the world needs blood.[2] Blood transfusion is a life protecting and saving intervention[3] and millions of worthy lives are saved each year globally.[4] It is a method of receiving blood components into ones circulation. Transfused blood may contain packed red cells, fresh frozen plasma, platelets and albumin protein etc. These products are separated from the donated blood via fractionation and then given to the patients as per need. Screening of blood before transfusion is of immense importance as it prevents blood borne diseases as well as transfusion reactions.[5]

Safe blood is an important component in health care and in averting the spread of communicable diseases globally. It is necessary for blood donor to disclose necessary medical information and duty of doctor to screen the blood always before transfusion.[6,7] However, the methods employed to screen blood are not hundred percent sensitive. Furthermore, there are uncommon viruses (hepatitis G, E, and human T-cell lymphotropic virus (HTLV)) and diseases (leishmaniasis), for which no standard screening methods have been devised as yet.[6]

The quality and safety of blood transfusion is of grave concern, predominantly in developing countries where 82% of the world's population lives.[8] About 5% to 10% of new HIV infections are transmitted through unsafe blood transfusions globally because of reasons such as blood collection from unsafe donors, poor laboratory

1. Tehsil Headquarter Hospital, Sargodha
2-4. Institute of Public Health, Lahore

Correspondence:
Rukhsana Hameed, Institute of Public Health, Lahore

Submission Date: 00-00-0000
1st Revision Date: 00-00-0000
Acceptance Date: 00-00-0000

procedures and inadequate testing of blood.[6] Hence, approximately 5% to 12% of patients with blood transfusion developed hepatitis.[9]

Safe blood is a universal right according to the World Health Organization (WHO). An essential pre-requisite especially for procurement of safe blood is to have a national program encompassing donor selection, recruitment, retention, and education; this will ultimately diminish disease transmission.[10]

Blood Transfusion Service is a vital part of modern health care system. It is the responsibility of government / national health authorities to ensure provision of safe and adequate blood and blood products at national level. Infectious agents such as HIV, hepatitis B, hepatitis C, syphilis and malaria can be transmitted through blood transfusion. Due to improper storage of blood and blood products, it can be contaminated with bacteria and can result in fatal results. It is essential to conduct research for assessment of this life saving service i.e. Blood transfusion. Moreover comparison of public and private sector can provide a good idea about their service delivery. Such studies can be utilized for healthcare provider and health planners so as to optimize prevention from transmittable diseases. Hence, present study was carried out to assess the blood transfusion safety mechanism of blood bank in public and private sector of Sargodha city along with evaluation of Blood Donors.

Material and Methods

It was a cross-sectional study conducted at blood banks in public and private sector of Sargodha city through Purposive sampling technique during three months. The sample size of the study was 100 blood donors (25 each) coming to four (04) blood banks of Sargodha city including two public sectors which are District Blood Bank, DHQ Teaching Hospital, Sargodha. (License No. 30) and District Blood Unit, Main Moulabakhash Hospital, Sargodha.(License No. 61) and two from private sectors which are Hilal-e-Ahmer Thalassemia and Hemophilia Blood Establishment. General Hospital Sillanwali Road, Sargodha (License No. 64)and Blood Bank and Hi-tech Lab. with Faiz Memorial Hospital, Sargodha (License No. 151).A questionnaire was prepared by researcher and finalized after pre-testing. The blood banks providing services in the city of Sargodha were assessed regarding safety mechanism by researchers and responses were noted on the questionnaire. Blood donors coming to the blood banks were also interviewed and their information was recorded. Data was then entered and analyzed using SPSS (Statistical Package for Social Sciences) version 20.0. Frequency tables were generated for all possible variables. Means and other parameters of central tendency were calculated for continuous data.

Results

There were total four blood banks chosen from the city i.e., two public sector and two private sector. All of the blood banks had documented policies and procedures displayed. Transfusion services were also governed by laws mentioned in blood bank act. Informed consent protocol was practiced before blood donation. Trained staff was present in the blood banks. Analysis of transfusion reaction was also monitored.

Before blood transfusion the screening test for hepatitis B, C and HIV screening was performed in all blood banks. Sexually transmitted diseases and malaria tests were also performed. The two (50%) blood banks used ELISA method for screening. A total of 100 blood donors were included in this study from 04 blood banks of Sargodha city consisting of two public and two private blood banks.

Regarding blood group of the respondents, there were mostly 37 (37%) donors having O blood group followed by 36 (36%) respondents who had B group, 18 (18%) had blood group A and only 09 (9%) had blood group AB as Shown in Fig 1.

Table 1: *Socio-Demographic profile of Participants*

Variable		Frequency	Percentage
Age (Years)	⩽25	62	62
24.84±6.54*	> 25	38	38
Gender	Male	99	99
	Female	01	01
Occupation	Students	32	32
	Businessman	18	18
	Skilled Worker	15	15
	Farmer	14	14
	Labourer	11	11
	Jobs	10	10
	Housewife	01	01
Total		**100**	**100**

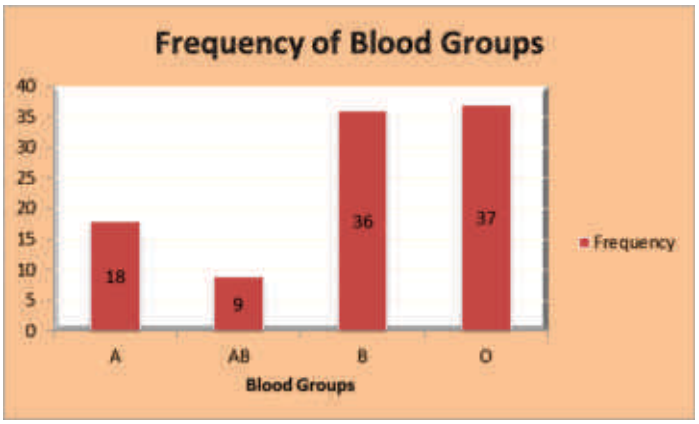


Fig 1 *Frequency Distribution of Blood Groups among Donors (n=100)*

Out of 100 donors, 85 (85%) had positive Rh factor and remaining 15 (15%) had negative Rh factor as shown in Fig 2

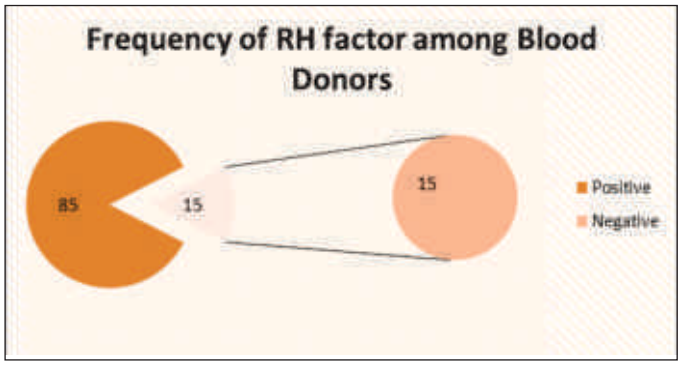


Fig 2 *Frequency Distribution of Rh factor among Donors(n=100)*

There were 28 (28%) smokers and remaining 62 (62%) of the donors were non-smokers. Out of 100 donors, 32(32%) had donated blood previously and amongst them 02 (6.3%) had donated in last 3 months, 16(50%) donated in last 6 months whereas 14 (43.7%) had donated one year ago.

Regarding risk factors for diseases and chronic diseases, following variables were observed.

Table 2: *Frequency Distribution of Risk Factors for Diseases among Donors (n=100)*

Variable		Frequency	Percentage
Discomfort During or After Donation	**No**	100	100
Tattooing Last 6 months	**No**	100	100
Ear Piercing Last 6 months	**No**	100	100
Dental Extraction Last 6 months	**Yes**	01	01

Table 3: *Frequency Distribution of Diseases among Donors (n=100)*

Diseases		Frequency	Percentage
Heart Disease	**No**	100	100
Lung Disease	**No**	100	100
Kidney Disease	**No**	100	100
Allergic Diseases	**No**	100	100
Familial Diseases	**No**	100	100
Malaria	**Yes**	06	06
Hepatitis B/C	**Yes**	06	06
Tuberculosis	**No**	100	100
Cancer	**No**	100	100
Sexually Transmitted Diseases	**No**	100	100

Discussion

The blood banks could serve as a major risk factor for transmitting diseases related to transfusion. In humans, different combinations of blood group antigens are present, producing a unique spectrum for every individual. Distribution of blood group antigens varies significantly in different populations and racial groups. So, the present study was designed to look both into policy and procedural practices and also blood donors detail in Sargodha city.

In this study, screening tests regarding HIV and hepatitis types B, C were performed in all blood banks. Sexually transmitted diseases and malaria tests were also performed. The two (50%) blood banks used ELISA method for screening. Kassi and coworkers (2011) undertook a study to estimate the Safe blood transfusion practices in different blood banks of Pakistan. Study revealed that among 23 blood banks, majority of blood banks i.e. 70% had a recruitment program for healthy donors and however, 9% of the blood banks said that they hired compensated (paid) blood donors. In all 23 blood banks, donors were screened for transmissible diseases such as HIV, Hepatitis B, C and syphilis whereas malaria test was run by all blood banks excluding one.[11] A study was carried out by Raza and associates results indicated that 5.57% were prohibited on positive screening tests. Study showed limited awareness about transfusion transmitted infections. Moreover, 94.9% donors were not protected for hepatitis B. Study concluded that in resource limited countries, it is essential to educate and counsel the donors regarding diseases associated with blood transfusion as treatment cost is not only heavy on pockets but also not widely available.[12]

As ABO blood grouping is also important for transfusion point of view hence its frequency assessment is important pertaining to hiring and recruitment of blood donors.[13] In this study, there were 37% donors having O blood group followed by 36% respondents who had B group, 18% had blood group A and only 9% had blood group AB. The study carried out in Karachi showed the similar picture with blood group O was prevalent (32.7%) group in their study. The ABO blood group system in their study showed a prevalence trend of O > B > A > AB analogous to our study. Another study conducted in Rawalpindi also reported blood group 'O' is quite prevalent group in that area.[13] Studies piloted in other countries such as Turkey, Hungary, Germany, Ukraine and Nigeria showed that blood group 'O' was comparatively more prevalent.[11] In other studies conducted in major cities of Pakistan, blood groups A, B, AB & O frequency were 28%, 34%, 7% & 31% in Peshawar, 28%, 30%, 9% 33% in Swabi, 18%, 24%, 5% & 53% in Wah Cantt, 24%, 32%, 11%, 33% in Hazara and 21%, 36%, 6% & 37% in Bahawalpur respectively.[14] The blood groups A, B, AB & O blood frequency were 34%, 29%, 4% & 33% in Nepal, 38%,10%, 3%, 49% in Australia, 41.7%, 8.6%, 3%,46.7% in Britain, and 41%, 9%, 4%, 46% in USA respectively.[14] A study conducted by Bhatti R et also showed similar pattern of ABO blood type distribution in Sindh province.[14] Blood group A showed prevalence rate of 14.4% while blood type AB have the least prevalence (8.3%; n=15). These results were in contrast to the study conducted by Mohammad Khan in which the most prevalent blood group was B type.[15] Other contrast studies reported in Baulichstan and Islamabad with ABO blood type distribution as B>A> O>AB and in twin cities as A>B>O>AB.[16-17]

Out of 100 donors, 85% had positive Rh factor and remaining had negative Rh factor. In study from Karachi showed 97.2% of Rhesus positive and 2.78% negative phenotypes.[14] In comparison with other regions of Pakistan the frequency of Rh + and Rh–blood groups were 67.2% & 32.8% in Bannu, 72.9% & 26.1% in Islamabad, 71.7% & 26.3% in Lahore, 79.5% & 20.5% in Gujrat, 76.8% & 23.2% in Peshawar and 73.9% & 26.1% in Wah Cantt respectively.[12-14] Rh + & Rh –ve frequency in other parts of world were 96.7% & 3.3% in Nepal, 83% & 17% in Britain, 85% & 15% in USA and 94.45% & 5.55% in India.[18] The observed dissimilarity in frequencies in local studies of Pakistan needs to be clarified further through studies with large and probable sampling. However, our figures are closer to many international studies. The study done in Karachi showed 92% were Rh+ and only 8% Rh- donors. These indications are consistent with the previous findings among Pakistani population.[19]

In this study, 32 (32%) had donated blood previously and amongst them 02 (6.3%) had donated in last 3 months, 16 (50%) donated in last 6 months whereas 14(43.7%) had donated one year ago. Regarding previous donations, there were 84.4% donors having positive Rh factor who donated previously as compared to 85.3% who had not donated previously. Whereas, there were 15.6% donors having negative Rh factor who had donated previously as compared to 14.7% who did not donated blood previously. The difference was statistically insignificant (p-value=0.904). Raza and associates results showed that repeat donors (69.5%) with primary and secondary qualifications made up the big chunk of reactive donors.[12]

The limitations of the study were study design, small sample size due to time limitations and blood donors personal information giving might have caused recall biased. The study would serve platform for future studies with larger sample size and prospective study designs.

Conclusions

It is concluded that Public & Private blood banks of Sargodha city were following all the procedures and rules stated in the law. The staff was trained and most of the important screening tests were done for the blood donors coming to the blood banks.

References

1. Ramani KV, Mavalankar DV, Govil D. Study of blood-transfusion services in Maharashtra and Gujarat States, India. J Health Popul Nutr 2009; 27(2): 259-70.
2. WHO, World Health Organization. Blood transfusion safety. Geneva, Switzerland: Department of Essential Health Technologies; 2006.
3. Khurshid M, Moiz B. Pathogen reduction technology in transfusion: where do we stand? J Coll Phys Surg Pak 2015; 25(11): 779-80.
4. Manzoor I, Hashmi N, Daud S, Ajmal S, Fatima H, Rasheed Z, et al. Seroprevalence of transfusion transmissible infections (TTIs) in blood donors. Biomedica 2009; 25: 154-8.
5. Aziz S, Ayub R, Shah N, Siddiqui S. Knowledge of blood transfusions, its complications & informed consent among medical students of public & private sector medical colleges of Peshawar. KJMS 2014; 7(1): 159-

161.

6. Malik MR, Majid S, Laghari MS. Determinants of blood donation behaviour of general public in Pakistan. P J M H S 2010; 4(2): 137.
7. Chaudhary IA, Samiullah, Khan SS, Masood R, Sardar MA, Mallhi SA. Seroprevalence of hepatitis B and C among the healthy blood donors at Fauji Foundation Hospital, Rawalpindi. Pak J Med Sci 2007; 23(1): 64-7.
8. Dhingra N, Lloyd SE, Fordham J, Amin NA. Challenges in global blood safety. World Hosp Health Serv 2004; 40(1): 45-52.
9. Mavenyengwa RT, Mukesi M, Chipare I, Shoombe E. Prevalence of human immunodeficiency virus, syphilis, hepatitis B and C in blood donations in Namibia. BMC Public Health 2014; 14: 424.
10. Arshad A, Borhany M, Anwar N, Naseer I, Ansari R, Boota S, et al. Prevalence of transfusion transmissible infections in blood donors of Pakistan. BMC Hematol 2016; 16: 27.
11. Kassi M, Afghan AK, Khanani MR, Khan IA, Ali SH. Safe blood transfusion practices in blood banks of Karachi, Pakistan. Transfu Med 2011; 21: 57-62.
12. Raza N, Qureshi H, Qureshi A. Reactive blood donor notification; their responses and perceptions: experience from Southern Pakistan. J Ayub Med Coll Abbottabad 2018; 30(3): 351-5.
13. Luby S, Khanani R, Zia M, Vellani Z, Ali M, Qureshi AH, et al. Evaluation of blood bank practices in Karachi, Pakistan, and the government's response. Health Pol Planning 2000; 15(2): 217-22
14. Shaikh S, Shariq A, Zuberi AM, Abbas SS. Abo and Rhesus blood group distribution in residents of Karachi. The Pakistan Journal of Medicine and Dentistry. 2018; 7(3):32-5.
15. Khan MS, Sibtain F, Tahir F, Kazi BM, Dil AS, Sultan S, et al Prevalence of blood groups and Rh factor in Bannu region NWFP(Pakistan). Pak J Med Res 2004; 43(1): 8-10.
16. Hussain A, Sheikh SA, Haider M, Rasheed T, Malik MR: Frequency of ABO and Rh Blood Groups in population of Balouchistan (Pakistan). Pak Armed Forces Med J 2001; 51(1): 22-6
17. Khan MS, Farooq N, Qamar N, Tahir F, Subhan F, Kazi BM, et al. Trend of blood groups and Rh factor in the twin cities of Rawalpindi and Islamabad. J Pak Med Assoc 2006; 56:299-302
18. Mathew EE, Godwin NB. Distribution of ABO and Rh-D blood groups in the Benin area of Niger delta: implication of regional blood transfusion. Asian J Transf Sci.2008; 2(1):3-5.
19. Parveen N, Rehman J, Hassan SH, Hassan Z, Rehman M. Different blood groups; association with body mass index in medical students of Karachi. Professional Med J 2016; 23(8):1001-4. 20

Nutritional Assessment Using Anthropometric Measurements of Children 02 to 05 Years of UC Ghalwan, Tehsil Alipur, District Muzaffargarh

Zahid Iqbal Hussain,[1] Rukhsana Hameed,[2] Asma Ali,[2] Summia Khan,[2] Anjum Razzaq[2]

Abstract

Introduction: Malnutrition is defined as a pathological condition of varying degrees of severity and diverse clinical manifestations, resulting from deficient assimilation of the components of the nutrient complex. It is one of the factors in an estimated 54% of all childhood deaths globally.

Objectives: The objectives of the study were assessment of nutritional status using anthropometric measurements of children 02 to 05 years of age from UC Ghalwan and identification of associated factors.

Methodology: It was a cross sectional descriptive study conducted among 102 children 2 to 5 years of age residing at UC Ghalwan, Alipur, District Muzaffargarh.

Results: Out of total 102, 56 (54.9%) were males and 46 (45.1%) were females. Mean age of children was 2.93±0.913 years.. Body mass index (BMI) showed 68 (66.7%) were normal, 09 (8.8%) were underweight, 01 (1%) was overweight and 24 (23.5%) were obese. Family type was significantly associated with nutritional staus of children

Conclusion: About 8.8% of the children living in Ghalwan union council were underweight. Nutritional deficiency must be prevented by educating their parents and guardians through LHW, media, educational institutions.

Key Words: Nutritional assessment, Body Mass Index (BMI), Children

Introduction

Malnutrition is defined as a pathological condition of varying degrees of severity and diverse clinical manifestations, resulting from deficient assimilation of the components of the nutrient complex.[1] It is one of the factors in an estimated 54% of all childhood deaths globally.[2] More than 50% of the child deaths maybe caused directly or indirectly by under nutrition.[3]

It is reported that over 50% children in South Asia are malnourished, and half of the world's malnourished children reside in Pakistan, India, and Bangladesh.[4] In Pakistan, malnutrition is stated to be present in 50-60% of the children and is associated with mortality in young children.[5] As the effects of malnutrition are highly visible on the physical, mental, social, and intellectual development of young children, therefore, importance of effective nutrition cannot be denied during early years.[6]

As per the National Health Survey of Pakistan, one out of every three children is malnourished, 6.2–8.3 million Pakistani children (30–40%) have a low height for their age, i.e., stunting, and more than 2.9 million children (>14%) have low weight for their height, i.e., wasting.[7]

The term anthropometric refers to comparative measurements of the body. Anthropometric measurements are used in nutritional assessments. Those that are used to assess growth and development in infants, children, and adolescents include length, height, weight, weight-for-length, weight for height, mid arm and head circumference. Individual measurements are usually compared to reference standards on a growth chart computed by WHO.[8]

Height-for-age is an index of cumulative effect of undernutrition during the life of the child. Weight-for-age is the combined effects of both, the recent and the long-term levels of nutrition, whereas weight-for-height

1. Tehsil Headquater Hospital, Hafizabad
2. Institite of Public Health, Lahore

Correspondence:
Rukhsana Hameed, Institite of Public Health, Lahore

Submission Date: 00-00-0000
1st Revision Date: 00-00-0000
Acceptance Date: 00-00-0000

reflects the recent nutritional experiences of the child. These indices are reasonably sensitive indicators of the immediate and underlying general causes of nutrition.[9] Among these three indices, the assessment of the nutritional status of children by weight-for-age is a very sensitive and recognized method which is most effective and used all over the world. [3,10] The risk of mortality was inversely related to children's height-for-age and weight-for-height. There is an increased mortality in children hospitalized for a treatable condition if simultaneously suffering from malnutrition.[10,11]

Several indexes and ratios can be derived from anthropometric measurements. However, the most well-known indicator of body fatness is the body mass index or "BMI." BMI is calculated by: weight (kilograms)/ height (meters^2) and categorized as: Kids who measure at the 85th to 94th percentiles are considered overweight, because of excess body fat or high lean body mass. A child whose BMI is between the 5th percentile to 85th percentile is in the healthy weight range. A child with a BMI below the 5th percentile is considered underweight.[12]

Nutritional status being an important component of Primary Health Care (PHC), is one of the important Millennium Development Goals (MDGs) and a fundamental indicator of the Socioeconomic Status (SES) of a country.[13] Globally, 20 million severely malnourished children are in South Asia and in sub-Saharan Africa, about 1 million of malnourished children die every year, the majority is never brought to health facilities. A strong community based appropriate care is needed through active case finding, or through sensitizing and mobilizing communities to utilize health services. It requires very careful monitoring as nutrient adequacy is hard to achieve. Children suffering from severe acute malnutrition need treatment.[14] More than 70% of children with protein-energy malnutrition live in Asia, 26% in Africa, and 4% in Latin America and the Caribbean. In Bangladesh, one-third of the population is <15 years of age, while according to PDHS 2012-13, the children in age group 10 to 19 years were 23.5% of total population.[15] Keeping in view importance of nutrition in children from 02 to 05 years, the present study was carried out with the help of questionnaire that contains information regarding anthropometric measurements (Height, weight, MUAC) for 02 to 05 years children of UC Ghalwan. With help of this study further research studies can be done and health education to community can be given to improve nutritional status.

The objective of the study were assessment of nutritional status using anthropometric measurements and identification of socio-demographic and cultural factors among children aged 02 to 05 years children of UC Ghalwan.

Material And Methods

It was a cross sectional descriptive study conducted among 102 children of 2 to 5 years of age selected through simple random sampling from UC Ghalwan, Tehsil Alipur, District Muzaffargarh. The sample size was calculated using following formula:

$$n = \frac{z^2_{1-a/2}\, P(1-P)N}{d^2(N-1) + z^2_{1-a/2}P(1-P)}$$

Where;

Proportion (P) = 45%

Absolute Precision (d) = 0.10

Population (N) = 7000

$Z^2_{1-\alpha/2}$ (95%) = 1.96

Sample Size (n) was **94**.

After the approval from ethical committee IPH and IMNCHR, LHWs were contacted for children lists. The data collection tools comprised of semi-structured interview questionnaire containing questions for socio-demographic profile, obstetric history, evaluation of anthropometric measurements for nutritional assessment of children aged 2 to 5 years. The measurements for MUAC, weight and height were taken with the help of LHW using measuring tape; weight machine and non-stretchable tape. Data analysis was performed through SPSS 20. P-value <0.05 was taken statistically significant.

Results

From total 102 respondents, 47 (46.1%) were up to 25 years and 56 (54.9%) were males. About 86 (84.3%) mothers were illiterate and 73 (71.6%) fathers were illiterate; 98 (96.1%) mothers were housewives and 75(73.6%) fathers were laborers and 51(50%) were living in nuclear type of family. Total family Income shows mean of 9166.7±6570.1 rupees. Mean age of children was 2.93±0.913 years. About 96(94.1%) children were breast fed. Mean weaning age was 7.11± 1.82 months. Approximately 89(87.3%) had complete vaccination.

Nutritional Status showed that there were 24 (23.5%) obese children, only 01 (1%) was overweight, 09 (8.8%)

Table 1: *Factors Affecting BMI in Children from 02 to 05 Years*

Variable		Body Mass Index			p-value	Remarks
		Abnormal	Normal	Total		
Age (Years)	Up to 2.5	19 (40.4%)	28 (59.6%)	47		
	Above 2.5	15 (27.3%)	40 (72.7%)	55	0.160	Insignificant
Total		34	68	102		
Sex of the Child	Male	15 (26.8%)	41 (73.2%)	56		
	Female	19 (41.3%)	27 (58.7%)	46	0.122	Insignificant
Total		34	68	102		
Father Education	Illiterate	23 (31.5%)	50 (68.5%)	73		
	Literate	11 (37.9%)	18 (62.1%)	29	0.535	Insignificant
Total		34	68	102		
Mother Education	Illiterate	28 (32.6%)	58 (67.4%)	86		
	Literate	6 (37.5%)	10 (62.5%)	16	0.700	Insignificant
Total		34	68	102		
Family Income	Up to 10000	22 (29.7%)	52 (70.3%)	74		
	Above 10000	12 (42.9%)	16 (57.1%)	28	0.209	Insignificant
Total		34	68	102		
Family Type	Nuclear	22 (43.1%)	29 (56.9%)	51		
	Extended	12 (23.5%)	39 (76.5%)	51	0.036	Significant
Total		34	68	102		
Breast Feeding	Yes	30 (31.3%)	66 (68.8%)	96		
	No	04 (66.7%)	02 (33.3%)	06	0.094	Insignificant
Total		34	68	102		

were underweight while 68 (66.7%) were of normal weight. Mean Mid upper arm circumference (MUAC) was 14.32±1.04 cm while mean Weight, height and BMI was 12.75±2.69 kilograms, 86.19±67 cm and 17.1± 2.07 kg/m2 respectively. Various factors associated with BMI are in the following table.

Discussion

Malnutrition results from various factors and is present in all developing countries. We made an effort to assess the prevalence of malnutrition in children aged 02 to 5 years of age and the associated demographic and social factors in this study. In our study, 68 (66.7%) of children were normally nourished while only 09 (8.8%) were malnourished. These findings are similar with overall estimates of national prevalence of malnutrition in Pakistan and India[16,17].

In our study, 56 (54.9%) were males and 46 (45.1%) were females. Similar proportion of the male and females were reported previously in literature.[18,19]

Education level of mothers has insignificant effect on the nutritional status of their children. However, in Pakistan, 52.4% of the mothers without a formal education have malnourished children, while mothers with formal education have a better understanding of the benefits of a small family, breast feeding and the weaning process, and hence have less malnourished children (23 to 24%).[19] In our study, 32.6% of mothers and 31.5% of fathers were without formal education.

Gender disparities in health and education provision are higher in South Asia. In one study, a girl in India was 30-50% more likely to die under five year of age than her counterpart boy. There was no gender difference in seeking medical advice but girls were about 2.5 times more malnourished than boys[3,10].

In our study, in between the age of twenty four to sixty months, only 94.1% of children were breast-fed during their first 24 months of life, while 5.9% of the children were not breast-fed at all. Children who received no breast feeding have a high frequency of abnormal nutrition (66.7%), which according to one study is estimated

to be almost 39%[20]. Similarly, delayed weaning, after one year of age, was associated with abnormal nutrition in 53.4% of children in another study.[19]

In our study, 29.7% families had income ≤ Rs.10000 per month. In earlier studies, families with low socio-economic status, where monthly income was Rs.20000 or less, had 52.2% abnormal children, while the families with an income of Rs.50000 and more, had 24.7% malnourished children.[19] Economic developments also brings down malnutrition and vice versa[20].

In our study, age, sex of the child and father education was found insignificant whereas only family type was statistically significant among normal and abnormal body mass index (BMI).

Conclusion

Nutritional deficiency is a serious health problem affecting the children from 02 to 05 years age group. It is clear from the study that about 8.8% of the children living in Ghalwan union council were underweight. The only factor that was found to be statistically significant was family type. Currently there is a need to focus on the dietary education of the children to choose correctly different food products.

References

1. Gopalan S. Malnutrition: Causes, consequences, and solutions. Nutrition 2000;16(7):556–8.
2. Ramalingaswami V, Jonsson U, Rohde J. Commentary: The Asian Enigma. UNICEF; 2006. Available at: http://www.unicef.org/pon06/nuenigma.htm
3. James DCS. Anthropometric Measurements. [online] Cited on: October, 2013. Accessed on: December 10, 2016. Available at: http://www.diet.com/ g/ anthropometric-measurements
4. Claeson M, Bos ER, Mawji T, Pathmanathan I. Reducing child mortality in India in the new millennium. Bull World Health Organ. 2000; 78(10):1192-9.
5. Bhutta ZA, Thaver D, Akram DS, Khan M. Situation and Program analysis of malnutrition among women and children in Pakistan. In: Bhutta ZA, editor. Maternal and Child Health in Pakistan Challenges and Opportunities. Pakistan: Oxford University Press; 2004.
6. Malik AS, Mazhar AU. Assessment of nutritional status of children under 48 months of age. Pak. Paed. Jr. 2006; 30(1):38-47
7. Bhutta ZA, Nizami SQ, Thobani S, Issani Z. Risk factors for mortality among hospitalized children with persistent diarrhoea in Pakistan. J Trop Pediatr. 2007. 43(6): 330-6.
8. Mian RMA, Ali M, Ferroni PA, Underwood P. The Nutritional Status of School-Aged Children in an Urban Squatter Settlement in Pakistan. Pak J Nutr 2002; 1(3): 121–3
9. Patwari AK. Diarrhoea and malnutrition interaction. Indian J. Pediatr. 2009; 66(1 Suppl):S124-34.
10. CDC. Overview of Anthropometry. [online] Cited on: October, 2013. Accessed on: December 10, 2016. Available at: https://www.cdc.gov/nchs/data/ nhanes/ nhanes_07_08/manual_an.pdf
11. Government of Pakistan. National Economic Survey 2006–7. Islamabad: GoP; 2007. Available at: http://en.wikipedia.org/wiki/Economy_of_Pakistan [Cited 26th May 2009]
12. WHO. Measuring a Child's Growth. [online] Cited on: 2008. Available at: http://www.who.int/ childgrowth/ training/module_b_measuring_growth.pdf
13. Economic Survey of Pakistan, 2006–07. Economic advisory wing, Finance division, Government of Pakistan.
14. Health and Development. Available from: www.who.int/ nutirtion. [Cited on Jan 25, 2009]
15. Rana A, Qureshi FA, Hansotia MF, Randell J, Rasheed S, Khan IA, et al. Human Nutrition. In: Iliyas M, editor. Public health and Community Medicine. Karachi: Time Publisher; 2006.P.321–50.
16. Nutritional status of children. National Nutritional Survey and National Health Service of Pakistan. 2004.
17. Syed SSM, Razi MS, Muhammed S, Amjad S, Affifi A. Frequency of anemia in pediatric OPD. Pak. Paed. Jr. 2000; 24(3):117-8.
18. Keane V. Assessment of Growth. Nelson Textbook of Paediatrics, 16th ed. 70.
19. Patwari AK. Diarrhoea and malnutrition interaction. Indian J. Pediatr. 2009; 66(1 Suppl):S124-34.
20. Abidoye RO, Adandly PA. Nutritional status of public primary school children: a comparison between an upland and riverine area of Ojo LGA, Lagos State Nigeria. Nutr. Health. 2000; 14(4):225-40.

Risk Factors of Oral Hygiene and Dental Caries among Rheumatic Heart Disease Patients in Tertiary Care Hospital Lahore; A Case Control Study

Aroosa Khan,[1] Aftab Ahmad,[1] Saba Saleem,[2] Sadaf Akram[2]

Abstract

Objectives: To identify the main risk factors contributing to poor oral hygiene and dental caries in the patients suffering from Rheumatic heart disease presenting at tertiary care hospital Lahore aged up to 15 years.

Materials and Methods: This study was conducted on one hundred and sixty (160) patients for the oral hygiene status in which 80 (cases) was rheumatic heart disease patients and other 80(controls) was non diseased aged up to 15 years.

Results: Present study showed that the caries rate, oral hygiene status and socioeconomic status were poor in cases as compared to controls.

Conclusion: Present study assessed the risk factors of oral hygiene and dental caries among rheumatic heart disease patient and showed marked difference between cases and controls.

Keywords: Dental caries, Oral hygiene, Rheumatic heart disease (RHD), Infective endocarditis.

Introduction

Oral hygiene is very important part of our lives when you not take care of your oral hygiene it will leads to many oral problems such as dental caries, gingivitis, periodontitis etc.[1] Untreated oral diseases and conditions can have a significant impact on quality of life. Poor oral hygiene leads to accumulation of plaque, it plays an important role in the etiology of oral diseases.[2] Dental caries is therefore potentially major public health significance in developing countries and need of focus on its prevention is a matter of urgency and it affect all age groups.[3] Caries prevalence appears to relate largely to cultural, dietary, socio economic factors through hereditary characteristics certainly exists. Poor oral health leads to oral infections in normal as well as in diseased individuals.[4]

Heart disease is one of the major problems which are due to poor oral hygiene; because of immune compromised they are more prone to oral infections and take especial measures during any dental treatment.[5] Rheumatic heart disease is caused by rheumatic fever and it occurs at any age, more common in developing countries. Socioeconomic and demographic factors in cardiac patients play a significant role in its development. These patients are at risk of bacteremia and infective endocarditis.[6,7]

The burden of cardiovascular disease rapidly increased and impaired dental health of these patients may aggravate their medical condition as well as leads to infective endocarditis, by using prophylactic antibiotics reduces its risk.[8,9] Rheumatic heart disease is a non-supportive complication and still cause morbidity and mortality in low and middle income countries, social determinants also affected a lot in cardiac patients.[10,11]

RHD not requires lifelong treatment it's all about the awareness of proper treatment and oral hygiene maintenance for better results and avoiding the complications, up to 60% RHD accounts of all cardiovascular disease in young children's and adults.[12] According to WHO, control of RHD is a multi-prolonged strategy and cannot be implemented due to lack of human sources, advanced equipment, health education programs and illiteracy.[13,14]

Several studies showed that a positive association between oral health and heart disease, regular visits of dentists can be prevented from oral infections in this

1. Avicena Medical College, Lahore
2. Institute of Public Health, Lahore

Correspondence:
Aroosa Khan, Avicena Medical College, Lahore

Submission Date: 00-00-0000
1st Revision Date: 00-00-0000
Acceptance Date: 00-00-0000

way they can change their attitudes towards dental hygiene.[15,16,17,18,19,20] Impact of general health and quality of life matters a lot for healthy oral health.[21,22] The aim of the study was to identify the main risk factors contributing to poor oral hygiene and dental caries in the patients suffering from Rheumatic heart disease presenting at tertiary care hospital Lahore aged up to 15 years.

Methodology

A questionnaire based convenient sampling was conducted on 160 (80 cases and 80 controls) aged up to 15 years appearing at Children Hospital Lahore.

Written permission from the dean of Children hospital was obtained for the current study.

Inclusion criteria for cases only rheumatic heart disease children's, both males and females aged up to 15 years were included and for controls healthy children's of same hospital setting, both males and females aged up to 15 years were included in this study.

Exclusion criteria for cases children's having any chronic disease other than heart disease and congenital disorders like autism and down syndrome were excluded and for controls children's unwilling to participate or feel shy to open the mouth were excluded.

Questionnaire and Data Analysis: Data was collected with the help of questionnaire which was pre-tested and then finalized. Verbal consent from parents was obtained, purpose of visit was explained. Data was collected by researcher itself. Data was entered, cleaned analyzed using SPSS version 20.0. Frequency tables were generated for all possible variables. Means and other parameters of central tendency were calculated for continuous data. Chi square was applied to find out association between categorical variables. Means were compared using student's t test or ANOVA where applicable. Bar and pie diagrams were used to present categorical data whereas Line, Histogram, Scatterplot and boxplot were used for continuous data. Odds ratio along with 95% CI was calculated for various variables followed by Logistic Regression to adjust the values.

Results

In total, 160 subjects were interviewed for the case control study. The average age of the participants was 9.58±5.42 years, and 55% of them were women. Of the members, about 48.5 % were from urban area and 52.5% were from rural area. Two-thirds of the RHD patients were aged less than 10 years, around 38% of the RHD patients were aged less than 10 years, and among controls, the percentage was 16%. The proportion of subjects with ≥2 siblings and overcrowding (>3 persons sharing a living room) (OR=1.7) have been reported more among the RHD patients. The monthly family income and education level of patients showed no significant difference across the groups (Table 1).

The characteristics of parents, particularly occupation and education of both parents, were compared across the groups. The numbers of mothers with low or no education and working mothers were more RHD patients compared to the reference group ($p<0.05$) (Table 2). Neither education nor occupation of fathers presented a significant difference across groups ($p<0.05$).

The significant majority 49.2% of RHD patients were living in urban houses and the majority 45% with RHD were not using tube well for drinking-water. Sleeping in floor was reported significantly more (17.6%) by the RHD (OR=2.5). The use of toothpaste was not different

Table 1: *Descriptive statistics between study groups*

Variable	NRHD (n=80)	RHD (n=80)
Age (Years)		
>10 years	52 (65%)	30 (38%)
≤10 years	28 (35%)	50 (62%)
Gender		
Male	48 (60%)	26 (40%)
Female	32 (45%)	44 (55%)
OR for female	2.5 (1.5-4.2)*	1.9 (1.2-3.1)*
Family size		
<5	44 (55%)	32 (40%)
≥5	36 (45%)	48 (60%)
OR for family size ≥5	0.4 (0.26-0.7)*	0.54 (0.3-0.9)*
Number of siblings		
≤2	39 (49%)	26 (32%)
>2	41 (51%)	54 (68%)
OR for >2	1.1 (0.71-1.8)	2.1 (1.3-3.4)*
Persons per room		
≤3	44 (55%)	28 (35%)
>3	36 (45%)	52 (65%)
OR for >3 persons	0.74 (0.5-1.2)	1.7 (1.1-2.7)*

*Statistically significant; CI=Confidence interval; NRHD=Non -rheumatic heart disease (control); OR=Odds ratio; RHD=Rheumatic heart disease; Figures in parentheses are percentages unless otherwise specified in the column -head

between the NRHD and RHD patients from the reference group. However, brushing twice or more a day and habit of brushing after meal were found to be less among the NRHD patients than other group. (Table 3)

Table 2: *Demographic characteristics of parents*

Parents Characteristics	NRHD (n=80)	RHD (n=80)
Mother's Education		
Secondary or above	20 (25%)	13 (16.3%)
Primary or less	24 (29%)	27 (33.7%)
Illiterate	36 (46%)	40 (50%)
X^2 p-value	6.7 (0.033)*	11.7 (0.003)*
Mother's Occupation		
House wife	69 (88%)	69 (86.2%)
Working women	11 (12%)	11 (13.8%)
OR for working mother	2.6 (1.1-6.2)*	3.6 (1.6-8.3)*
Father's Education		
Secondary or above	47 (59%)	25 (43.8%)
Primary or less	33 (41%)	45(56.2%)
OR for primary or less	1.2 (0.7-1.9)	0.7 (0.4-1.1)
Father's Occupation		
Labour-intensive job	23 (29%)	36 (45%)
Moderate-activity job	24 (30%)	21 (26%)
Sedentary-activity job	33 (41%)	23 (29%)
X^2 p-value	1.6 (p 0.06)	1.8 (p 0.41)

*Statistically significant; NRHD=Non-rheumatic fever (control); OR=Odds ratio; RHD=Rheumatic heart disease; Figures in parentheses are percentages unless otherwise specified in the column-head

The risk factors of RHD were evaluated by means of the binary logistic regression model. The model clarified 43.6% of the variability in the RHD status were more likely to develop RHD (OR=2.2, 95% CI 1.1-4.3). The risk of RHD was also high among urban residents (OR= 3.1, 95% CI 1.2-8.4), and amongst people living in brick-built house (OR=3.6, 95% CI 1.6-8.1). Family-size showed an opposite association with the risk of RHD; More than 5 members in a family showed a reduced risk of RF. Though, the number of siblings (>2) appeared as a significant predictor. Offspring of working mothers (OR=7.6, 95% CI 2.0-24.2), illiterate mothers (OR= 2.6, 95% CI 1.2-5.8), and those who did not brush after meal (OR=2.5, 95% CI 1.0-6.3) were more likely to develop NRHD. (Table 3)

Age, gender, area of residence, wall material at house, family-size, number of siblings, and number of people sharing a living room, and education and occupation of mothers appeared as the significant predictors of RHD compared to the reference non rheumatic control. A significant increased risk of RHD was evident in women (OR=2.2, 95% CI 1.2- 4.2), urban residents (OR=2.0, 95% CI 1.2-7.0), living in brick-built house (OR=2.8, 95% CI 1.3-5.3), having siblings >2 (OR= 4.4, 95% CI 2.2-8.7), child of working mother (OR=6.2, 95% CI 2.1-18.4), child of illiterate mother (OR=2.5, 95% CI 1.2-4.9), and overcrowding (OR=1.9, 95% CI 1.0-3.4). Age over 10 years (OR=0.1, 95% CI 0.1-0.3)

Table 3: *Living conditions and oral health*

Factors	NRHD (n=80)	RHD (n=80)
Residence		
Urban	72 (90%)	62 (78%)
Rural	8 (10%)	18 (21%)
OR for rural	0.2 (0.1-0.4)*	0.4 (0.2-0.6)*
Wall materials		
Non brick	70 (88%)	22 (40%)
Brick	11 (12%)	48 (60%)
OR for Non brick	2.3 (1.4-3.7)*	1.8 (1.2-3.0)*
Water Supply		
Supply or surface water	29 (36%)	52 (65%)
Tube well	51 (64%)	28 (35%)
OR for tube well	0.3 (0.29-0.6)*	0.55 (0.34-0.9)*
Bed		
Khat	72 (90%)	71(88.8%)
Floor	8 (10%)	9 (11.2%)
OR for floor	1.8 (0.72-4.1)	2.5 (1.16-5.8)
Dentifrice		
Conventional	12 (15%)	9 (11.2%)
Tooth pastes	68 (85%)	71 (88.8%)
OR for tooth pastes	0.46 (0.2-1.01)	0.55 (0.25-1.2)
Brush frequency		
Once daily or less	29 (36%)	38 (47.5%)
Twice daily or more	51 (64%)	42 (52.5%)
OR for twice or more	0.6 (0.4-0.9)*	1.0 (0.6-1.7)
Brush after meal		
No	59 (73%)	68 (85%)
Yes	21 (27%)	12 (15%)
OR for yes	0.2 (0.13-0.5)*`	0.5 (0.3-1.1)

*Statistically significant; NRHD=Non-rheumatic fever (control); OR=Odds ratio; RHD=Rheumatic heart disease; Figures in parentheses are percentages unless otherwise specified in the column-head

and a large family-size (OR=0.5, 95% CI 0.2-0.9) appeared as the protective factors for RHD. (Table 3)

Discussion

In the present study, overcrowding and low level of education of mothers increased the risk of RHD patients. Urban residence, living in brick-built house, having three or more siblings, mothers working out of home, and overcrowding appeared as the significant risk factors of RHD in general in the case-control study. However, age over 19 years and a large family-size appeared as the protective factors for RHD.

Result of present study showed that plaque deposit in cases (68.8%), in controls (41.2%), p=0.000 which is significant and cases have 3.133 more risk of developing disease. Calculus deposit in cases (33.8%), in controls (12.7%), p=0.002 which is significant and cases have 3.515 more risk of developing disease. Caries in cases (64.9%), in controls (45.6%), p=0.017 which is significant and cases have 2.205 more risk of developing disease. The study performed by Maharaj et al., (2012)[23] who reported that plaque and gingival scores was (31.8% and 54.6%) and caries (56.8%). The reason for this difference may be due to sample size, place of study and study design.

In rheumatic heart disease, the socio-economic factors play a significant role and mostly children having heart disease due to poor socio-demographic factors such as residency (urban, rural), father and mother education, poor sanitation, construction of house, malnutrition, family type, no of rooms. Results of present study showed that (75.9%) cases lives in rural areas, in controls (40.0%) lives, p=0.000 which is significant and 4.373 more risk of developing disease, this disease more common in rural areas. Results of our study almost same than study conducted by Oksana et al., (2019)[24] who reported that 71.9% children were rural area.

As far as education was concerned, father and mother education was very important in very aspects of life. The present study showed that (46.8%) father illiterate in cases, (16.7%) in controls, p=0.000 which is significant and (56.6%) mother illiterate in cases, (20.5%) in controls, p=0.000 which is significant and (43.4%) in cases literate mothers, in controls (79.5%). The findings of our study showed RHD more common in illiterate mothers as compared to controls mothers and mostly mothers are house wives. Mother education was very important for the children awareness. Due to illiteracy, the people were less aware for the diseases and maintenance of oral health.

As far as sex of the children was concerned, present study discloses that more than half of the children were males (62.0%), females (38.0%) in cases as in controls males (53.8%), and females (46.2%). The study showed that developing disease more in males as compared females in cases and controls. The findings of our study was not comparable with the study carried out by Vinajagamoorthy et al., (2019)[4] who has male to female ratio 1.4:1 of age 5-15 years.

Parents attitude towards child oral health matters a lot, (65.0%) cases and in (98.7%) controls was satisfactory attitude and unsatisfactory (35.0%) cases, in (1.3%) controls, p=0.000 which is significant, 42.000 more risk of developed disease as compared to controls. It is observed that among families with low socio-economic status, illiteracy, less awareness and nutritional status were more risk of heart disease and poor oral hygiene in patients. Before going any kind of dental treatment, also concerned with current cardiologist of patient and heart disease patients have monthly dental checkup was needed.

Conclusion

Rheumatic heart disease is a cause of mortality, morbidity in low income countries and due to poor oral health they lead to many oral infections, risk of infective endocarditis which is a complication for RHD. Present study assessed the risk factors of oral hygiene and dental caries among rheumatic heart disease patients aged up to 15 years. The low socio-economic status, illiteracy, nutritional status, eating habits, environmental factors, demographic, age, gender, district and time period more common factors of causing heart disease and oral hygiene.

Further studies are needed on vast level to know the prevalence of association between oral hygiene and rheumatic heart disease among children's to prevent them from this problem.

References

1. Riaz BK, Selim S, Karim MN, Chowdhury KN, Chowdhury SH, Rahman MR. Risk factors of rheumatic heart disease in Bangladesh: a case-control study. Journal of health, population, and nutrition. 2013;31(1):70
2. Chi DL, Scott JM. Added sugar and dental caries in children: a scientific update and future steps. Dental Clinics. 2019;63(1):17–33.

3. Fernando S, Tadakamadla S, Bakr M, Scuffham P, Johnson N. Indicators of risk for dental caries in children: a holistic approach. JDR Clinical & Translational Research. 2019;4(4):333–41.
4. Vinajagamoorthy SA, Nirubaa U, Ragunathan I. Disease burden of Rheumatic Heart Disease among children attending the Paediatric Cardiology Unit, Teaching Hospital, Jaffna. 2019;
5. Habte S, Mekasha A. Oral Health Knowledge, Practices and Attitude among Parents/Caretakers of Children with Heart Disease on Follow up at Tikur Anbessa Hospital. Ethiopian Journal of Health Development. 2018; 32(2).
6. Jankelow D, Cupido B, Sliwa K, Zühlke L, Ntsekhe M, Manga P, et al. Prevention of infective endocarditis associated with dental interventions. SA Heart. 2017; 14(3):170–4.
7. Saeed MH, Afzal MS. Awareness of rheumatic heart disease in patients suffering from rheumatic heart disease. Journal of University Medical & Dental College. 2016;7(3):64–70.
8. Kumar R. Rheumatic heart disease: A neglected public health priority. Indian journal of public health. 2019; 63(1):1.
9. McGlacken-Byrne S, Parry H, Currie P, Wilson N. Failure of oral penicillin as secondary prophylaxis for rheumatic heart disease: a lesson from a low-prevalence rheumatic fever region. Case Reports. 2015; 2015: bcr 2015212861.
10. Abdullahi LH, Smit I, Engel ME, Watkins DA, Zühlke LJ. Task sharing to improve the prevention, diagnosis and management of rheumatic heart disease: a systematic review protocol. BMJ open. 2018;8(2):e019511.
11. Ghimire R, Dhungana SP. A study on prescribing pattern of drugs in patients with rheumatic heart disease at tertiary care hospital. Journal of Nobel Medical College. 2018;7(2):25–9.
12. Rahman AM, Rahman A, Chowdhury AT, Ahmed F, Hossain D, Farzana L et al. Rheumatic fever and Rheumatic heart disease in Bangladesh: Challenges and Remedies. Cardiovasc.j. 2018; 10(2): 206-11.
13. Carvalho N. Current Endocarditis Prophylaxis Guidelines and Incidence of Infection. Int J Clin Cardiol. 2019; 6:144.
14. Chaudhary S, Jaiswal R, Sachdeva S. Dental considerations in Cardiovascular patients. Indian Heart Journal. 2016: 572-75.
15. Duval X, Millot S, Chirouze C, Selton-Suty C, Moby V, Tattevin P, et al. Oral streptococcal endocarditis, oral hygiene habits, and recent dental procedures: a case-control study. Clinical Infectious Diseases. 2017; 64(12): 1678–85.
16. Shaghaghian S, Zeraatkar M. Factors affecting oral hygiene and tooth brushing in preschool children, Shiraz/ Iran. Journal of dental biomaterials. 2017;4(2):394.
17. Maimon I, Hallaq E, Merrick J. Parenting a child with an intellectual disability in Bedouin families. BEDOUIN HEALTH. :219.
18. Opinya NG, Kimei D. Caregiver's Oral health care practices and level of utilization of oral health services and the dental caries experience of 3-12 year olds suffering from heart disease in Nairobi, Kenya. Modern approaches in Dentistry and oral health care. 2018; 2(1): 119-124.
19. Al-Harbi K. Clinical spectrum and considerations of rheumatic fever and rheumatic heart disease: call for National Disease Prevention and Control Programme in Saudi Arabia. J Dent Med Sci. 2019;18(3):37–42.
20. Zühlke LJ, Beaton A, Engel ME, Hugo-Hamman CT, Karthikeyan G, Katzenellenbogen JM, et al. Group A Streptococcus, acute rheumatic fever and rheumatic heart disease: epidemiology and clinical considerations. Current treatment options in cardiovascular medicine. 2017;19(2):1–23.
21. Maharaj B, Vayej AC. Oral health of patients with severe Rheumatic heart disease. Cardiovascular Journal of African. 2012 Jul; 23(6): 336-39
22. Boyarchuk O, Dmytrash L. Clinical manifestations in the patients with primary immunodeficiencies: data from one regional center. Turkish Journal of Immunology. 2019;7(3):113–9.

Frequency of Stress, Anxiety and Depression in the caregivers of cancer patients by using Depression Anxiety Stress Scale (DASS)

Tabish Faheem Khan,[1] Surrya Jafar,[1] Ayesha Usman,[1] Muhammad Umar Farooq[1]

Abstract

Cancer not only affects the cancer patients but also the caregivers of cancer patients. These days dealing with cancer has become a family affair as the caregivers are constrained to deal with the consequences of disease like disruption of daily life, stress, worries, anxiety, fear of metastasis, recurrence or fear of losing loved one. Family caregivers are the co-sufferers who need support although they aren't the cancer patients themselves but its impact directly affects the quality of their lives.

Objective: The objective of the study was to find out the frequency of stress, anxiety and depression in the caregivers of cancer patients by using depression anxiety stress scales (DASS) and the factors associated with it

Material & Methods: This was a cross-sectional study conducted in newly re-designated union council. Adult caregivers of cancer patient's resident of UC were taken as respondents. Time duration was three months and convenient sampling method was selected. The taken sample size was 87. In this study, a table was developed informing us about the variables that had to be used and what analytical output was generated when we used those variables for statistical analysis

Results: In this study the mean depression score of the caregiver was 21.6 similarly the mean anxiety score was 10.9 and mean stress score was 16.9.It was found that very few caregivers were not suffering from depression and were normal about 6 which was mere 6.90% but many were having extremely severe depression i.e. 26 caregivers which was 29.9%.Stress level in the study was observed low. Normal percentage was high including 35 persons comprising 40.23%, mild stress was 26.44%, moderate stress was 18.3%, severe stress was 13.8 and extremely severe stress cases were found just 01 that was 1.15%.

Conclusion: A considerably high prevalence of depression and less stress is found in cancer patient caregivers. There are various factors influencing the health related quality of life of cancer patient's caregivers.

Keywords: Depression, Anxiety, Stress, Cancer, Caregivers, DASS-10

Introduction:

Cancer is a non-communicable disease and one of the leading causes of death worldwide. Cancer is becoming in fact a chronic disease and has its impact on family dynamics as it interferes with daily life, effecting both the patients and caregivers. Cancer patient caregivers play an important role in patient's disease management and palliation which may adversely affect their own health in the longer run.[1–3] These days dealing with cancer has become a family affair as the caregivers are constrained to deal with the consequences of disease like disruption of daily life, stress, worries, anxiety, fear of metastasis, depression and recurrence, or fear of loss of the loved one. Through exchange of support and coping behavior, the cancer patients and the care givers affect each other's adjustment in dealing with the disease. Caregivers can be the partners of adults with cancer, children of parents with cancer, parents and siblings of children with cancer and any loved ones.

Family caregivers are the co-sufferers who need support although they aren't the cancer patients themselves but its impact directly affects the quality of lives of the caregivers as a whole. In the past recent years, the family

1. Institute of Public Health, Lahore

Correspondence:
Tabish Faheem Khan, Institute of Public Health, Lahore

Submission Date: 00-00-0000
1st Revision Date: 00-00-0000
Acceptance Date: 00-00-0000

care givers as they care for their loved ones have to face multiple demands as cancer patients receive chemotherapies, radiotherapies and other multiple high-dozed painful treatments etc. The cancer patients and their care givers are having an interdependent relationship so it is very important to have well prepared and confident family caregivers. The confident caregivers have a positive outlook towards life, less caregiver strains, feel less fatigued thus providing better management of patient medication and patients feel better management symptoms, feel energetic, spend less time in bed and enjoys a good quality of life.[4]

For both cancer patients and caregivers, cancer is stressful event and as the number of cancer patients is increasing day by day, there must be identification and recognition of psychological health and well-being of cancer patients as well as their care givers.

DASS SCALE can be use to rule out frequency of stress, anxiety and depression in caregivers of cancer patients. The DASS is a set of three self-report scales designed to measure the negative emotional states of depression, anxiety and stress. Each of the three DASS scales contains 14 items, divided into subscales of 2-5 items with similar content. The Depression scale assesses dysphasia, hopelessness, devaluation of life, self-deprecation, and lack of interest/involvement, anhedonia, and inertia. The Anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. The Stress scale is sensitive to levels of chronic non-specific arousal. It assesses difficulty relaxing, nervous arousal, and being easily upset/agitated, irritable/over-reactive and impatient. Scores for Depression, Anxiety and Stress are calculated by summing the scores for the relevant items.[5]

There are some common factors which have a great impact on the distress level of caregivers of cancer patients; even they can suffer from several levels of anxiety, clinical levels of depression and stress reductions. Therefore it is important for the clinical and researchers to be family-focused, realizing the fact that cancer affects the whole family and not just the cancer patients.[5] Cancer affects the caregiver in many ways but has much impact on their psychological well-being. Stress undoubtedly has a negative effect on the caregivers psychological well-being but if it continues then can greatly affect the physical well-being of caregivers as well.

The cancer patients and their caregivers have a very strong correlation and have an interdependent relationship, so there is need of an hour to know psycho-social consequences of cancer for children of parents with cancer, for parents and siblings of children with cancer and for partners of adults with cancer. In light of the literature review and supported relevant research studies, it has become essential for the healthcare professionals to treat the cancer patients and care givers as the unit of care. The objective of the study was to find out the frequency of stress, anxiety and depression in the caregivers of cancer patients by using depression anxiety stress scales (DASS) and the factors associated with it.

Material and Methods

This study was performed by Cross-sectional design on the caregivers of cancer patient residents of union council 53, Data Ganj Buksh Town, Lahore, Punjab, Pakistan for three months by convenient sampling. Study duration was three months. Data was entered and analyzed using SPSS 25.0.

Results

In this study the mean depression score of the caregiver was 21.62±8.9. Similarly, the mean anxiety score was 10.96±4.7 and mean stress score was 16.87±6.4. In this study, it was found that in male stress was 62.2% and in females it was 58.0% as p value was 0.69, so this difference was statistically insignificant. In divorced the stress was found amongst 83.3%, in married it was 51.0, in single it was 73.7% and in widow it was 61.5% but this difference was found statically insignificant. In people living in joint family system stress was noticed to be 62% and those living in nuclear family type the stress was 56.8% and the p value is 0.62 which is statistically insignificant. Financial assistance is an important variable in the study, so there were 62.2% caregivers stressed and 37.8% were not saying yes they have financial assistance available. The difference is statistically insignificant as shown in Table 1.

Similarly when divorced, married, single and widow were compared in marital status the difference was statically insignificant .Caregivers living in joint family were having anxiety 72% whereas in nuclear were having anxiety 70.3% but the difference is statically insignificant as p-value is 0.86. Similarly different variables and factors are shown in detail in Table 2.

The Study shows that in male depression was noticed 94.6% whereas in females was 92%. This difference was statistically insignificant as p-value is 1. In divorced

Table 1: *Association of Stress with Socio-demographic Characteristics*

Factors		Stress				p-value	Remarks
		Yes		No			
		n	%	n	%		
Gender	Male	23	62.2	14	37.8%	0.695	Insignificant
	Female	29	58.0%	21	42.0%		
Marital Status	Divorced	5	83.3%	1	16.7%	0.213	Insignificant
	Married	25	51.0%	24	49.0%		
	Single	14	73.7%	5	26.3%		
	Widow	8	61.5%	5	38.5%		
Family Type	Joint	31	62.0%	19	38.0%	0.622	Insignificant
	Nuclear	21	56.8%	16	43.2%		
Financial Assistance Available	Yes	28	62.2%	17	37.8%	0.629	Insignificant
	No	24	57.1%	18	42.9%		
Financial Assistance Required	Yes	26	65.0%	14	35.0%	0.359	Insignificant
	No	26	55.3%	21	44.7%		
Gender of Patient	Male	19	50.0%	19	50.0%	0.102	Insignificant
	Female	33	67.3%	16	32.7%		

depression was 100% in married; it was 93.9% in \single; the depression was 94.7% and in widow; this were 84.6% but the difference is statistically insignificant. In joint family type depression was 88%; however in nuclear family; it was found to be 100% and the difference is statistically insignificant. Depression chi-square bivariate analysis is shown in detail in Table 3

Discussion

The present study finds that the frequency of anxiety,

Table2: *Association of Anxiety with Socio-demographic Characteristics*

Factors		Anxiety				p-value	Remarks
		Yes		No			
		n	%	n	%		
Gender	Male	28	75.5%	9	24.3%	0.434	Insignificant
	Female	34	68.0%	16	32.0%		
Marital Status	Divorced	4	66.7%	2	33.3%	0.758	Insignificant
	Married	33	67.3%	16	32.7%		
	Single	15	78.9%	4	21.1%		
	Widow	10	76.9%	3	23.1%		
Family Type	Joint	36	72%	14	28%	0.860	Insignificant
	Nuclear	26	70.3%	11	29.7%		
Financial Assistance Available	Yes	29	64.4%	19	35.6%	0.146	Insignificant
	No	33	78.6%	9	21.4%		
Financial Assistance Required	Yes	32	80.0%	8	20.0%	0.097	Insignificant
	No	30	63.8%	17	36.2%		
Gender of Patient	Male	28	73.7%	10	26.3%	0.660	Insignificant
	Female	34	69.4%	15	30.6%		

Table 3: *Association of Depression with Socio-demographic Characteristics*

Factors		Depression				p-value	Remarks
		Yes		No			
		n	%	n	%		
Gender	Male	35	94.6%	2	5.4		Insignificant
	Female	46	92.0%	4	8.0%	1.0	
Marital Status	Divorced	6	100%	0	0.0%	0.567	Insignificant
	Married	46	93.9%	3	6.1%		
	Single	18	94.7%	1	5.3%		
	Widow	11	84.6%	2	15.4%		
Family Type	Joint	44	88.0%	6	12.0%	0.038%	Insignificant
	Nuclear	37	100%	0	0.0%		
Financial Assistance Available	Yes	40	88.9%	5	11.1%	0.204	Insignificant
	No	41	97.6%	1	2.4%		
Financial Assistance Required	Yes	37	92.5%	3	7.5%	1.00	Insignificant
	No	44	93.6%	3	6.4%		
Gender of Patient	Male	35	92.1%	3	7.9%	1.00	Insignificant
	Female	46	93.9%	3	6.1%		

stress and depression in cancer patient caregivers is much high and quality of life of caregivers is low. Whereas the presence of cancer itself has been found to be a dominant source of depression and anxiety in caregivers, several other factors may exaggerate the symptoms. These include relationship and communication between caregiver and patient, caregivers social, economic, and psychological attributes, caregiver's health, and care giving duration.

In the study it was resulted that mostly caregivers adapted well to the cancer of relative and appeared to be less at risk for psychological morbidity. Loss of a child only appeared to be a long lasting bereavement and women were more prone to distress than men.[7] but in our study it is shown that usually females play the role of caregivers more than men as 42.5% were male caregivers whereas female caregivers were 57.5%. If any caregiver is present in a family this symbolizes the presence of depression and its symptoms within the family. This may be due to adverse change in socio-economic status. Multidisciplinary psychological interventions are necessary.[8] Younger caregivers are found more depressive than adults and depression prevails in caregivers who are low income.[9]

It was also found that very few caregivers were not suffering from depression and were normal about 6 which were 6.90% but many were having extremely severe depression i.e. 26 caregivers which was 29.89%. Stress level in the study was observed less.

This study showed that the depression in males was 94.6% whereas in females it was 92%. The difference was statically not significant. In males stress was 62.2% and in females it was 58.0% as p-value was 0.695, so this difference was statically insignificant. In males anxiety was 75.5% and in females it was 68.0%, the difference is statically insignificant as p-value is 0.434.

Caregiver's health may be improved by strengthening psychological and psychosocial environment as it has been found that subjective burden and lack of positive aspects of care giving leads to poorer health.[10–12]

Identification of factors affecting the physical and psychosocial health of cancer caregivers may not only reduce caregiver distress but may also help in reducing patient's distress by improving caregivers' motivational and psychomotor abilities to care for patient. As the cancer caregivers are at high risk of disease, appropriate interventions targeting their psychosocial, physical, and mental health needs are required to reduce this risk. Some studies have suggested that psychosocial interventions for caregivers may help in improving the overall quality of life.[10,11] In Pakistan it is very important issue to give importance to caregivers of cancer patients in the cancer hospital and in oncology wards for improvement of health and life.

Conclusion

The frequency of depression, anxiety and stress in cancer patient caregivers, as measured with validated instruments, is approximately 21.6, 10.97 and 16.9, respectively. This high prevalence of depression and stress affects the quality of life of the caregiver. Several associations have been identified between depression and life factors including caregiver's sleep quality, burden; duration of care giving; spouse caregiver; caregiver being unemployed; caregiver with chronic disease; financial problems, and female sex.

In this detailed study; it emerged that though the caregivers are over-stressed and badly stressed yet they were found far more depressed which would surely be having negative impact on the already compromised health of the cancer patients but the worst of it that patient would suffer further for an early recovery

Negative associations with depressive symptoms included overall quality of life of caregiver; pre-loss grief; caregiver's education level; caregiver's age; caregiver's sense of coherence; caregiver's bondage with patient; and caregiver's social support. These factors are needed to be further studied in future because a wide range of domains is reported by these studies but with less endorsement from other studies.

References

1. Ji J, Zoller B, Sundquist K, et al. Increased risks of coronary heart disease and stroke among spousal caregivers of cancer patients. Circulation 2012; 125: 1742–7
2. Miller GE, Murphy ML, Cashman R, et al. Greater inflammatory activity and blunted glucocorticoid signaling in monocytes of chronically stressed caregivers. Brain Behav Immun 2014;41:191–9.
3. Vitaliano PP, Zhang J, Scanlan JM. Is caregiving hazardous to one's physical health? A meta-analysis. Psychol Bull 2003;129:946–72.
4. Northhouse LL. Helping patients and their family caregivers cope with cancer. Oncology Nursing Forum. 2012;39(5):500-6
5. Edwards B, clarke V. The psychological impact of a cancer diagnosis on families: The influence of family functioning and patients illness characeteristics on depression and anxiety Psycho-oncology. 2004; 13(8): 562-76
6. Kostak MA, Avci G. Hopelessness and depression levels of parents of children with cancer. Asian pacific journal of cancer prevention.2013;14(11):6833-8
7. Hagedoorn M, Kreicbergs U, Appel C. Coping with cancer. The perspective of patient's relatives. Actaoncologica . 2011;50(2):205-11
8. Lim SM, Kim HC, Lee S. Psychosocial impact of cancer patients on their family members. Cancer research and treatment.2013;45(3):226-33
9. Majeed MH, Khokhar MA, Abid M, Raza A, Qaisar MN, Ali AA, et al. Frequency and correlates of symptoms of anxiety and depression among young caregivers of cancer patients: a pilot study . BMC Research Notes. 2018;11(1)
10. Applebaum AJ, Breitbart W. Care for the cancer caregiver: a systematic review. Pall Supp Care 2013; 11: 231–52.
11. Northouse L, Williams A, Given B, et al. Psychosocial care for family caregivers of patients with cancer. J Clin Oncol 2012;30:1227–34.
12. Fekete C, Tough H, Siegrist J, et al. Health impact of objective burden, subjective burden and positive aspects of caregiving: an observational study among caregivers in Switzerland. BMJ Open 2017;7:e017369.

Knowledge of Dengue Fever and Mosquito Avoidance attitudes and practices among Urban and Rural community of Multan, Pakistan.

Muhammad Uzair Mukhtar,[1] Muhammad Asif Mahmood,[2] Zahra Fayyaz[3]

Abstract

Dengue fever is a serious public health issue in Pakistan. The objective of this study was to determine knowledge, attitudes and practices (KAP) about dengue fever and its prevention and improving disease prevention and health education of people of Multan district, Pakistan.

Material & Methods: A cross-sectional study was carried out among urban and rural residents of the study district. Every fifth household was purposively selected and one representative from each household was interviewed using a standardized questionnaire. Interviews were conducted between April and November 2021.

Results: The study included a total of 256 households were involved in this study. Out of those 256 participants, 128 were from urban areas and 128 were from rural areas. Out of 256 respondents (128 rural and 128 urban), 88.2% knew that dengue is spread by mosquitoes. Only 19.92% of people could list 3 dengue symptoms (i.e., fever, headache and bleeding). Regarding knowledge about breeding sites, 95.31% of people generally knew that the dengue vector breeds in water but did not know the specific breeding sites. The survey found that 79.7% of rural respondents and 82.8% of urban respondents agreed that dengue disease is a serious. 78.8% of rural respondents believed in the risk of dengue. Kerosene is considered the most effective and sustainable conventional method by 62.5% of rural respondents and 51.6% of urban respondents, while 84.4% of rural respondents and 81.3% of urban respondents believed that indoor residual spraying is the most efficacious chemical control method.

Conclusion: The study findings established a lack of comprehension in study community about dengue. The results also determined that, the possessed knowledge also does not translate into the adoption of preventive measures. Stronger monitoring and community health education are needed to improve community mobilization and participation.

Keywords: Dengue, KAP, Multan, Pakistan.

Introduction

Dengue fever is an acute pyretic illness characterized by severe headache, pains (behind the eyes, muscles and joints), and skin rash.[1] Dengue is caused by infection with the dengue virus, a member of flavivirus of the Togaviridae family[2] with four serotypes "DEN-1, DEN-2, DEN-3 and DEN-4".[3] The virus is transmitted by Aedes mosquitoes, Ae. aegypti is the most important vector.[4] Aedes aegypti exist in densely populated areas of Asia, the Americas and Pacific islands and affects about two-third of the population worldwide.[5] According to a global estimate, about 50 million cases of dengue fever occur every year.[6] The first reported outbreak of dengue occurred in 1994 in and its prevalence has increased rapidly since then[7]. During the year 2006-11, 40,987 dengue cases were reported and 490 deaths occurred in Pakistan.[8]

Unfortunately, there is no specific medication for dengue and the vector control is the most critical strategy in dengue prevention.[9] Good knowledge, attitudes and practices among the general public of dengue endemic areas are needed to significantly reduce the spread of

1. Institute of Public Health, Lahore

Correspondence:
Muhammad Uzair Mukhtar, Institute of Public Health, Lahore

Submission Date: 00-00-0000
1st Revision Date: 00-00-0000
Acceptance Date: 00-00-0000

dengue. However, there is little knowledge about public KAP about dengue, its prevention and dengue vector and its control among the people of Multan. Understanding the general community's KAP on this provides valuable information for effective planning and citizens involvement in disease control. This study describes the KAP probing of dengue, its transmission, symptoms and prevention and assesses people's knowledge about vectors and vector control methods within the general community in urban and rural areas of Multan District Union Councils.

Material and Methods

A cross-sectional data collection was carried out in Rural Union Councils (i.e., Sher Shah) and Urban Union Councils (i.e., Officer Colony) of Multan from April 2021 to November 2021.

The total number of houses in this area was 1280 and every fifth house was selected by systematic random sampling method to collect information. Therefore, 256 households (128 rural and 128 urban) were selected for the study.

The participants were included on the basis of adult households aged 18 or above from both genders from all economic strata were asked to take part in the study. The exclusion was based on households unwilling to join and households of public and private health sector employees were not included in the survey. After enrollment in the study, each respondent was interviewed with a pre-designed questionnaire. Consent was obtained from all those agreed to respond and privacy was assured during the study. The data collected was entered into Excel for analysis.

Results

Socio-demographic

A total of 256 eligible study subjects (128 rural and 128 urban) were interviewed. Out of these, 17.2% were female and 82.8% were male from rural areas and 98.4% were male and 4.6% were female from urban areas respondents. About 59.4% of rural and 62.5% of urban respondents fell in the age group above 35 years (Table I) and 80.5% of rural and 89.8% of urban participants were married. The education status of rural area participants showed 45.3% were illiterate, while 38.3% of urban respondents were in middle education (Table II).

As to occupation, 25.8% of rural area respondents were unemployed while 46.8% of urban respondents were involved in some business (Table III). 97.7% of rural and 100% urban respondents lived in Pakka Makan (Brick house) (Table IV)

Table 1: *Age group of respondents (n=256)*

Age group	Rural (n=128)		Urban (n=128)	
	Number	%age	Number	%age
15-20	3	2.3	1	0.8
21-25	15	11.7	15	11.7
26-30	16	12.5	17	13.3
31-35	18	14.1	15	11.7
Above 35	76	**59.4**	80	**62.5**

Table 2: *Education status of respondents*

Education	Rural (n=128)		Urban (n=128)	
	Number	%age	Number	%age
Illiterate	58	45.3	11	8.6
Primary level education	31	24.2	17	13.3
Middle level education	27	21.1	49	38.3
Secondary level education	8	6.3	38	29.7
Higher secondary education	4	3.1	13	10.2

KAP of Dengue Fever, its vector and Control

Regarding knowledge about dengue fever, 99.2% of rural and 100% urban respondents already knew or heard about the disease. Regarding knowledge of dengue

Table 3: *Occupation of respondents*

Occupation	Rural (n=128)		Urban (n=128)	
	Number	%age	Number	%age
Unemployed	33	25.8	12	9.4
Business	23	18	60	46.8
Farmer	31	24.2	6	4.7
House Wife	18	14.1	3	2.3
Private Job	13	10.2	18	14
Govt. Job	7	5.5	15	11.6
Student	2	1.6	10	7.8
Military	1	0.8	4	3.1

Table 4: *Type of housing of respondents*

Symptoms	Rural (n=128)		Urban (n=128)	
	Number	%age	Number	%age
Fever and headache	124	96.9	80	62.5
Fever, headache and Bleeding	3	***2.3***	48	***37.5***
Others	1	0.8	00	00

Table 5: *Knowledge of signs and symptoms of dengue*

Type of house	Rural (n=128)		Urban (n=128)	
	Number	%age	Number	%age
Pakka Makan (Brick house)	125	**97.7**	128	**100**
Kacha Makan (Mud house)	2	1.6	00	00
Tent	1	0.8	00	00

fever signs and symptoms, 96.9% of rural participants could list only 2 symptoms (i.e., fever, headache), while 37.5% of urban participants could list 3 symptoms (i.e., fever, headache and bleeding) (Table V). DF is transmitted by mosquito bites and was known by 82.8% of rural respondents and 93.8% of urban respondents. (Table VI).

Most of the population, i.e., 94.55% of rural respondents and 96% of urban respondents, generally knew that the dengue vector breeds in water, but did not know the specific breeding sites. When asked about the time of

Table 6: *Knowledge regarding transmission of dengue fever*

Transmission	Rural (n=128)		Urban (n=128)	
	Number	%age	Number	%age
Mosquitoes bite	106	82.8	120	93.8
Don't know	15	11.7	7	5.5
Person to person contact	4	3.1	00	00
Blood Transfusion	2	1.6	1	0.78
Flies	1	0.8	00	00

mosquito bite, 61.7% of rural and 82% urban respondents thought it was dawn and dusk. As for their sources of DF information, 46.1% of rural and 42.2% urban respondents mentioned radio/television (Table VII). 74.2% of rural respondents believe that mosquito bites can be reduced by mosquito nets, while 58.4% of urban respondents believe that it is due to repellents. (Table VIII). Almost similar numbers of rural and urban respondents (99%) believed that dengue could be controlled by insecticide spray, and 86.7% of rural communities and 92.2% of urban communities responded that they would consult a doctor for the treatment of dengue.

Practices about Dengue Fever, its Prevention and Control Methods:

The survey revealed that 79.7% of rural and 82.8%

Table 7: *Source of information about dengue fever*

Source of information	Rural (n=128)		Urban (n=128)	
	Number	%age	Number	%age
Radio/TV	59	46.1	54	42.2
Health Officials	38	29.7	27	21.1
Print/Social Media	25	***19.5***	46	***35.9***
Relatives/Friends	6	4.7	1	0.8

Table 8: *Knowledge regarding reducing mosquito bite*

Reduce mosquito bite	Rural (n=128)		Urban (n=128)	
	Number	%age	Number	%age
Bed nets	95	74.2	40	31.2
Removal of breeding sites	14	10.9	14	10.9
Screen Windows	12	9.4	30	23.4
Others	2	1.5	00	00
Repellents	5	3.9	44	34.3

urban respondents agreed that dengue is a severe disease, and 78.8% of rural respondents were sure about the risk of dengue, but surprisingly 58.6% of urban respondents were not sure about the risk. 75% of both rural and urban respondents agreed that dengue can be prevented. 98% of both rural and urban respondents believed that insecticide spray can kill the mosquito. Kerosene oil was thought to be the most effective and sustainable conventional method by 62.5% of rural and 51.6% urban respondents (Table IX), while 84.4% of rural and 81.3% urban respondents believed that indoor residual spray is the most effective chemical control method (Table X).

83.6% of rural and 95.3% urban respondents said they practice conventional methods for the prevention of dengue fever. About 77.3% of rural and 94.3% urban

Table 9: *Effective conventional method for mosquito control.*

Conventional method	Rural (n=128)		Urban (n=128)	
	Number	%age	Number	%age
Kerosene Oil	80	62.5	66	51.6
Don't Know	37	28.9	9	7.0
Cover Exposed parts	7	5.5	30	23.4
Others	2	1.6	00	00
Cow Dung	1	0.8	00	00
Source Reduction	1	***0.8***	23	***18***

respondents replied they practice the elimination of breeding sites, but when asked about the frequency of breeding site elimination 64.1% of rural and 46.1% of

Table 10: *Effective chemical control method*

Reduce mosquito bite	Rural (n=128)		Urban (n=128)	
	Number	%age	Number	%age
IRS	108	**84.4**	104	**81.3**
Kerosene Oil	9	7	8	6.3
Fogging	5	***3.9***	15	***11.7***
LLINs	4	3.1	00	00
Don't Know	2	1.6	00	00

urban respondents replied sometimes, they do so; not on regular basis (Table XI). 49.2% of rural and 73.4% of respondents practiced full-sleeved clothes as a preventive measure during work (Table XII), while 82% of rural and 97.7% of urban respondents practiced mosquito nets during sleep.

Discussion

It is a fact that community participation is essential to control mosquito-borne diseases. Our study showed that most respondents agreed that mosquitoes are responsible for dengue, but do not know the specific breeding sites. Naturally, this makes people less interested in mosquito control. Although most respondents have heard of dengue fever, very few listed only 3 symptoms of dengue (fever, headache and bleeding). We noted level of dengue related knowledge was relatively high amongst the urban participants, but we found little evidence that this knowledge was put into practice by the two study subjects. Respondents agreed that dengue prevention was possible and were aware of the importance of eliminating breeding sites, but the frequency of this practice was disappointing. Lack of personal responsibility has also been a problem in the fight against dengue fever in several countries such as Thailand[10], Malaysia[2] and Puerto Rico[11]. And this was also true in Laos, and 22% of the study contributors blamed the government[12]. Filling this knowledge gap while planning and scheming programs and activities to inform both study subjects regarding dengue preventive actions.

Table 11: *Practice of breeding site elimination*

Elimination of Breeding site	Rural (n=128)		Urban (n=128)	
	Number	%age	Number	%age
Sometime	82	64.1	59	46.1
Never	25	19.6	3	2.3
Often	18	14.1	37	28.9
Daily	3	***2.3***	29	22.7

Table 12: *Preventive measure during work station*

Practice	Rural (n=128)		Urban (n=128)	
	Number	%age	Number	%age
Use of Full Sleeves Clothes	63	49.2	94	73.4
Covering head and neck	34	26.6	31	24.2
Nothing	20	15.6	2	1.6
Don't know	10	7.8	1	0.8

Our findings are consistent with previous studies, as a similar survey in the peri-urban locality of Pak Ngami determined that the majority of the community did not have in-depth knowledge about dengue[13]. A study conducted in a semi-urban zone in Malaysia showed similar results where 95% of the participants were familiar of dengue, but information about dengue control was insufficient[14]. A small trail of individuals going to Karachi's tertiary care hospitals, was similar to our findings, nevertheless 90% of respondents had heard of dengue fever, but only 38.5% of them possessed adequate dengue related information[15]. As evidenced by Syed et al in their study of adults from high and low socioeconomic groups in Pakistan, only 35% sample of the study had specific knowledge about dengue fever and vector[16]. Another important finding was that urban respondents were uncertain about the risk of DF and similar results were obtained by Karunamoorthy et al. A survey conducted in Pakse; Laos also found that a huge sum of people was unsure about the risk of DF[17].

Key information of our survey was the non-significant association amongst literacy level and knowledge. This is evidenced from the reality that media is the main source of information about dengue fever and Aedes mosquito, irrespective of their literacy level. There is a significant relationship noted when it comes to TV as a source of information dengue knowledge.

Our findings highlight the fact that there is a nonsignificant relationship between attitude and sociodemographic factors. This is considered since all the interviewee belong to the similar region, ethnic group and faith and have a similar raising. But several socio-demographic factors did not significantly affect their attitude.

Our results indicated that there is a significant relationship between mosquito control practices and sociodemographic factors, as the rural community is mainly persuaded by customs. An excellent specimen is the water storage practice.

The data obtained from this study is of prime importance because it's a foremost investigation carried out in Multan, Punjab. However, there are few deficiencies,

although the results provide valuable information that will aid concerned functionaries in crafting, initiating and implementing dengue prevention programs preventive actions that can be applied to deal with increasing dengue problems.

Conclusion:

Our findings conclude that increased dengue-related knowledge in citizens of Multan does not transcribe into the embracing of preventive measures. But they encounter troubles for instance, acquiring accurate facts about dengue fever. For this, information, education and communication (IEC) materials in the local language may be developed and provided to the residents. Strengthening surveillance and community health education are needed to improve community mobilization and participation. Information about mosquito breeding sites, fatal consequences of mosquito bites and control measures should be disseminated to the community in modern and effective ways. So improved community knowledge and awareness translate into social mobilization for greater public involvement in the fight against mosquito-borne diseases.

Conflict of Interest None

Funding Source None

References

1. Lam, S. K. (1995). Dengue haemorrhagic fever. Reviews in Medical Microbiology, 6(1), 39-48.
2. Hairi, F., Ong, C. H., Suhaimi, A., Tsung, T.W., bin Anis Ahmad, M. A., Sundaraj, C., & Soe, M. M. (2003). A knowledge, attitude and practices (KAP) study on dengue among selected rural communities in the Kuala Kangsar district. Asia Pacific Journal of Public Health, 15(1), 37-43.
3. Arslan, A., Mukhtar, m. U., Mushtaq, S., Zakki, A.B., Hammad, M., & Bhatti, A. (2015). Comparison of susceptibility status of laboratory and field populations of Aedes aegypti against Temephos in Rawalpindi. Journal of Entomology and Zoology studies, 3(4), 374-378.
4. Pang, T. & Lam, S. K. (1983). The immunopathogenesis of dengue haemorrhagic fever. Immunology today, 4(2), 46-9.
5. Mukhtar, M, U., Mushtaq, S., Arslan, A., Zaki, A,B., Hammad, M. & Bhatti, A. (2015). Laboratory study on larvicidal activity of different plant extracts against Aedes aegypti. International Journal of Mosquito Research, 2 (3), 127-130
6. Mushtaq, S., Mukhtar, M, U., Arslan, A., Zaki, A.B., Hammad, M. & Bhatti, A. (2015). Probing the residual effects of Deltamethrin on different surfaces against malaria and dengue vector in Pakistan by designing laboratory model. Journal of Entomology and Zoology studies, 3(4), 440-443.
7. Zaki, A, B., Munir, M, A., Hassan, S, A., et al. (2016). Adulticidal Efficacy of Azadirachta Indica (Neem Tree), Sesamum Indicum (Til) and Pinus Sabinaena (Pine Tree) Extracts Against Aedes Aegypti under Laboratory Conditions. Pakistan Journal of Medical Research, 55(1), 11-15.
8. Arslan, A., Rathor, H,R., Mukhtar, M, U., et al. (2016). Spatial distribution and insecticide susceptibility status of Aedes aegypti and Aedes albopictus in dengue affected urban areas of Rawalpindi, Pakistan. Journal of vector borne diseases, 53(2), 136-143.
9. Yong, B, H. (1993). Critical care aspects of Dengue haemorrhagic fever / Dengue shock syndrome. The Malaysian Journal of Pathology, 15 (1), 35-9.
10. Phuanukoonnon, S., Brough, M. & Bryan, J, H. (2006). Folk knowledge about dengue mosquitoes and contributions of health belief model in dengue control promotion in Northeast Thailand. Acta tropica, 99(1), 6-14.
11. Pérez-Guerra CL, Zielinski-Gutierrez E, Vargas-Torres D, Clark GG: Community beliefs and practices about dengue in Puerto Rico. Rev Panam SaludPublica 2009, 25: 218–226.
12. Nalongsack S, Yoshida Y, Morita S, Sosouphanh K, Sakamoto J: Knowledge, attitude and practice regarding dengue among people in Pakse, Laos. Nagoya J Med Sci 2009, 71:29–37.
13. Mayxay M, Cui W, Thammavong S, Khensakhou K, Vongxay V, Inthasoum L, Sychareun V, Armstrong G. Dengue in peri-urban Pak-Ngum district, Vientiane capital of Laos: a community survey on knowledge, attitudes and practices. BMC public health. 2013 May 3;13(1):434-441
14. Gunasekara T, Velathanthiri V, Weerasekara M, Fernando S, Peelawattage M, Guruge D, et al. Knowledge, attitudes and practices regarding dengue fever in a suburban community in Sri Lanka. Galle Medical Journal. 2015. 17(1):10-17
15. Khan SJ, Usman M, Abbass Y, Hussain M, Ali M. KAP study on malaria. Gomal Journal of Medical Sciences. 2010;8(2): 257-260.
16. Syed M, Saleem T, Syeda UR, Habib M, Zahid R, Bashir A, Rabbani M, Khalid M, Iqbal A, Rao EZ, Saleem S. Knowledge, attitudes and practices regarding dengue fever among adults of high and low socioeconomic groups. J Pak Med Assoc 2010, 60:243–247.
17. Karunamoorthi K, Kumera A. Knowledge and health seeking behavior for malaria among the local inhabitants in an endemic area of Ethiopia: implications for control. Health. 2010 Jun 28; 2(06):575-581

Perception Regarding Pictorial Warning Messages on Cigarette Packs Among Adult Male Cigarette Smokers in Lahore City: A Cross-Sectional Study

Shahid Mahmood,[1] Maryam Muzaffar,[1] Mehak Sughra,[1] Maryam Hameed,[1] Sheikh Salman Afzal,[1] Ruqqaya Awan[1]

Abstract

Background: Communicating health hazards in relation to cigarette smoking through labelling warning messages on cigarette packs has been used as a preventive strategy in many countries. The extent to which these messages are effective and how cigarette smokers perceive these messages is inadequately examined.

Objective: The objective of this study is to describe the perception of adult smokers regarding pictorial warning messages on cigarette packs in Lahore city

Materials and Methods: It was a descriptive, cross-section study conducted in urban towns of Lahore city during June-October 2021. Of 238 adult male cigarette smokers invited for study, 195 completed an interview-based survey. In addition to socio-demographic characteristics, responses on questions related to awareness of warning messages on cigarette packs, their impact on quitting cigarettes, peer discussions and similar themes were recorded. Data were managed and analyzed using SPSS version 25.

Results: Of 195 participants, 169 (86.7%) knew the purpose of health warning messages labelled on cigarette packs, yet only 44(22.6%) were fearful of developing disease, about 90(46%) said these messages were unreal, however, half of these participants ignored these messages altogether. Albeit, those self-employed, completed secondary school and those smoking more than one pack of cigarette per day believed that health-warning messages on cigarette pack had positive impact on quitting cigarette smoking.

Conclusion: Labelling health-warning messages on cigarette packs is less effective in communicating hazardous effects of cigarette smoking among male adults in a metropolitan city of Pakistan. This strategy alone will not be able to provide a deterrence against smoking cigarette.

Key words: Cigarette packs, Pictorial warnings, Smokers, Avoidance, Perception, Awareness, male cigarette smokers, cross sectional survey, cigarette pack per day

Introduction

Cigarette smoking is a global epidemic among all age groups and social strata. Despite its health hazards and long-term effects, a substantial number of individuals especially young adults are increasingly adopting this deleterious habit. The consumption of cigarettes in Pakistan was estimated to be around 90 million cigarettes annually during 2015.[1] It has been estimated that the mortality and morbidity from tobacco use will increase, almost, three-fold worldwide in next 25 years.[2] Cancer, cardiovascular diseases and chronic obstructive pulmonary disease continue to be the main health problems associated with cigarette smoking. Furthermore, likelihood of dying from heart disease and stroke because of smoking has increased many times. Nearly 166,000 people die annually in Pakistan from smoking related causes, accounting 9% of total deaths.[3] Cigarette smoking is associated with premature death from chronic diseases, economic losses to society, and a substantial burden. World Health Organization (WHO) predicts that if appropriate measures are not taken, death toll due to smoking will increase to 10 million per year by 2030, with 70% of these occurring in the developing world.[4]

Smoking prevalence in Pakistan is 8.8 percent.[5] Preva-

1. *Allama Iqbal Medical College, Lahore*

Correspondence:
Shahid Mahmood, Allama Iqbal Medical College, Lahore

Submission Date: 00-00-0000
1st Revision Date: 00-00-0000
Acceptance Date: 00-00-0000

lence is highest in Baluchistan (14 %) and in the age category of 50 or older (16%). In 2018, the economic burden attributed to smoking related illnesses was Rs.192 billion (USD 1.3 billion).[6] Smoking-attributable expenditure on cardiovascular disease was Rs.123 billion (USD 0.9 billion), which was 69% of the total economic cost of tobacco attributed illnesses in Pakistan.[4,6] The economic cost in males was nearly three times higher than females.[5]

The WHO Framework Convention on Tobacco Control (FCTC) is transforming health warnings on tobacco product packaging around the world. The treaty was approved on 21 May 2003 and became operative on 27 February 2005 and now has 165 countries signatory to this convention.[7] Article 11 of the FCTC states that package health warnings must be at least 30% and should be at least 50% of the package's front and back. The use of pictures is optional.[8] FCTC Guidelines recognize that health warnings with graphic images of the negative health effects are far more effective than text-only warnings. Compared to text-only warnings, pictures are more noticeable, more memorable and have more emotional impact.[9]

The International Tobacco Control Policy Evaluation Project (the ITC Project) is an international research collaboration involving over 100 tobacco control researchers and experts from 22 countries who have come together to conduct research to evaluate the impact of tobacco control policies of the WHO Framework Convention on Tobacco Control (FCTC).[8]

The purpose of pictorial warning messages was to communicate health hazards related to cigarette smoking and it was introduced with a hope that these will warn the smokers about the deleterious effect of smoking and they would take informed decisions to quit this habit. However, the increasing number of individuals adopting this health hazard show that these health warnings are not as effective as intended. The most important stake holder in this regard is the cigarette smokers and knowledge about their perception of these health warning messages is essential to decide for continuation of this preventive strategy. Royal College of Physicians for the first time presented a report "Smoking and Health" to the general meeting of Fellows of the College on October 26th, 1961 and "Health Warning Labels" were introduced in 1966.[10] A study conducted in 2017 showed that pictorial cigarette pack warnings elicited stronger quit intentions than text-only warnings. Negative affect (fear, guilt, disgust, anxiety, and sadness) was a key driver of the effect of pictorial warnings on quit intentions. Compared to text-only warnings, pictorial warnings elicited more negative affect, which was associated with greater quit intentions.[11]

There are only few studies available on this subject in Pakistan and this subject has not been investigated in a metropolitan city of Lahore. The objective of this study is to describe the perception of adult smokers regarding pictorial warning messages on cigarette packs in Lahore city and gather their insight about the impact of these warning messages to quit cigarette smoking. This information will guide the public health managers to modify the preventive strategy by taking into the account of the perception and insights of an important stakeholder (cigarette smoker) for quit smoking campaigns.

Material and Methods

This was a descriptive, cross sectional study conducted during June-October 2021 in urban towns of a metropolitan city of Lahore. Male cigarette smokers aged 18 years and above were invited for the study in busy market areas, including all towns of Lahore city, using non-probability convenient sampling technique. Sample size was calculated by using open Epi software, where anticipated population proportion was taken as 10%, with 5% absolute precision, at 95% level of significance. Of 238 individuals invited for the study, 195 completed the in-person interview form. Each interview took 20-25 minutes each. Interview schedule asked about sociodemographic profile (age), employment status (unemployed, self-employed, skilled jobs, unskilled jobs, students, retired), educational status (no formal schooling, completed primary education, completed secondary education and above). Regarding cigarette-smoking history, duration of smoking cigarettes and number of cigarettes smoke each day was recorded. Years of smoking (<5 years, 5-10 years, more than 10 years of smoking) were categorized. We defined perception as "The way in which pictorial warnings is regarded, understood, or interpreted". Questions included in interview form include: purpose of these health messages, what smokers feel when they see these messages (feeling of disgust, curiosity or nothing), whether pictures on these packs are real or if they believe that cigarette smoking is related to occurrence of these diseases, whether smokers thought about quitting smoking by looking at these messages, or whether smokers discuss about these messages with their peers; what strategies smokers

adopt to ignore these messages. After each interview, forms were checked for missing entries and then these forms were handed over to supervisor for data entry and management using SPSS version 25. After checking data for inaccuracies and missing entries, descriptive analysis was conducted to describe baseline characteristics and presented as frequency distribution and percentages. Data were then stratified according to the age group (<30 years and 30 years or above) and responses were cross tabulated with age. We used Chi-squared test to examine difference of proportion between age and various perception themes. We used $p<0.05$ as being statistically significant difference between categories. Finally, we depicted the opinion of smokers about the potential of health warning messages to convince them to quit cigarettes by generating a tornado chart.

Results

Of 238 male adult smokers invited for this study, 34 refused to participate, and data of nine participants were not included in analysis due to either not fulfilling study objectives or missing information. Finally, data 0f 195 participants were analyzed (Figure 1). Baseline characteristics of these participants show that half (51.8%) of them were aged between 30-49 years and 12% were aged 50 years and above. Among them, about 28 (14%) were unemployed, 58 (29.7%) were self-employed and 13% were students. Most participants (45%) had completed secondary school and 52(26.7%) did not attend any formal school (Table 1). Regarding duration of smoking and number of cigarettes smoked per day, we found that 90(46.2%) had been smoking for less than five years whereas 20(10.3%) were smoking for more than ten years. Most participants (40%) stated that they smoked 5-10 cigarettes per day, while 6% of these participants were smoking more than 20 cigarettes per day (Table 1). When stratified these participants on the basis of age, we found that smokers aged less than 30 years felt more disgusting on looking health warning messages on cigarette packs, compared with those aged 30 years or above (56% versus 44%); less fearful of pictures of disease manifestations thank older individuals (15% versus 84%) and more likely to cover pack while using these cigarette packs (52% versus 48%) (Table 2). On the other hand, those aged 30 years and above were more likely to be aware of the purpose of these health warning messages on cigarettes pack (59%; overall awareness 86.6%); about 87 (96.7%) perceive that pictures on these packs are fake and they do not believe that cigarettes caused these diseases. Thirty one participants (53%) aged 30 years and above thought of switching cigarette brand due to these warning messages, whereas 25 (67.6%) compared to younger participants (32.4%) stated that they transferred cigarettes to another pack without any warning messages. All these participants responded that they received advice from peers to quit smoking and use of these warning messages by these peers (Table 2). We found the perception about these messages being fake among older participants than those aged <30 years and this difference was statistically different ($p<0.001$). Similarly, older participants become more fearful by lloking at the picture messages ($p<0.002$).

Opinion of adult male smokers in Lahore city regarding the impact of labelling health warning messages on cigarettes indicates that only those smoking more than 20 cigarettes per day believed that presence of these messages played important role in communicating effective advice to smokers for quitting cigarettes (55% versus 45%), whereas most participants stated that these messages had no impact whatsoever in convincing smokers to quit cigarettes (Figure 2). According to participants in all age groups, educational classes, occupational groups or any duration of smoking, only 10-20% perceived the positive impact of these health-warning messages on quitting cigarettes(Figure 2).

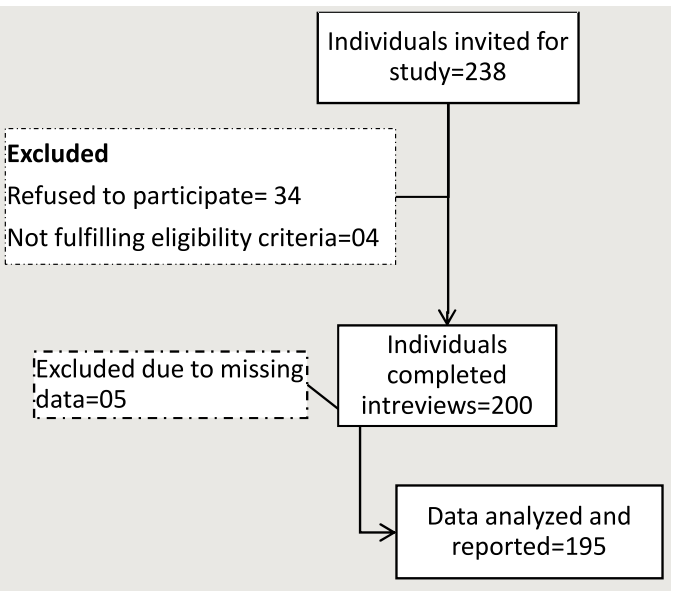


Figure 1: *Flow diagram showing recruitment process of study participants*

Table 1: *Baseline characteristics of adult male smokers completed survey in Lahore city regarding their perception*

Characteristics	Numbers	Percentage
Age		
Less than 30 years	70	35.9
30-49 years	101	51.8
50 years and above	24	12.3
Occupational status		
Unemployed	28	14.4
Self-employed	58	29.7
Skilled Job	41	21.0
Un-skilled Job	31	15.9
Student	25	12.8
Retired	12	6.2
Educational Status		
No formal Schooling	52	26.7
Completed Primary School	32	16.4
Completed Secondary School	88	45.1
Graduation or above	23	11.8
Duration of smoking		
Less than 5 years	90	46.2
5-10 years	85	43.6
More than 10 years	20	10.3
Number of cigarettes/day		
<5 cigarette/day	52	26.7
5-10 cigarettes/day	78	40.0
>10 -20 cigarettes/day	54	27.7
>20 cigarettes /day	11	5.6

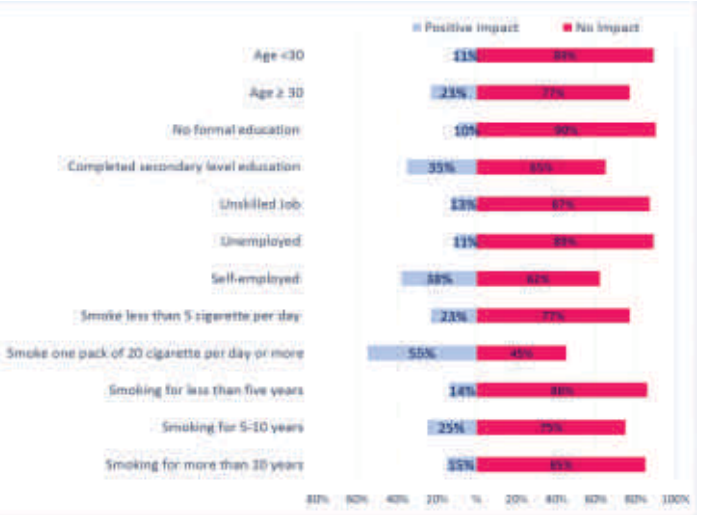


Figure 2: *Perception of adult male smokers in Lahore city regarding the impact of labelling Health Warning Messages (HWM) on cigarette packs for quitting cigarette smoking (n=195)*

Discussion

The aim of this study was to describe the perception of male adult smokers regarding health-warning messages printed on cigarette packs. We found that more than eighty percent cigarette smokers were aware of the purpose of labelling these messages on cigarette pack,

Table 2: . *Perception regarding Health Warning Massages (HWM) printed on cigarette packs and its potential impact on male adult cigarette smokers in Lahore city (n=195)*

Perception of HWM on Cigarette packs	Age (Years)		Total of the sample	p-value
	<30	⩾ 30		
	N (%)	N (%)	N (%)	
Purpose of HWM on packs				
Aware about the purpose of HWM	70 (41.4%)	99 (58.6%)	169 (86.7%)	<0.001
Feeling when see HWM on packs				
Feel disgusting when see HWM	40 (56.3%)	31 (43.7%)	71 (36.4%)	<0.001
Feel curious when see HWM	27 (45.8%)	32 (54.2%)	59 (30.3%)	
Don not feel anything when see HWM	03 (4.6%)	62 (95.4%)	65 (33.3%)	
Perceive HWM on pack as unreal (fake)	03 (3.3%)	87 (96.7%)	90 (46.2%)	<0.001
Believed that cigarettes causes diseases	54 (36.0%)	96 (64.0%)	150 (76.9%)	0.95
Fearful when see disease pictures	07 (15.9%)	37 (84.1%)	44 (22.6%)	0.002
Thought of switching brand due to HWM	28 (47.5%)	31 (52.5%)	59 (30.3%)	0.027
Think quitting smoking, impact of HWM	51 (43.6%)	66 (56.4%)	117 (60.0%)	0.006
Usually discuss HWM with peers	31 (32.0%)	66 (68.0%)	97 (49.7%)	0.251
Peers advise to quit smoking using HWM	15 (37.5%)	25 (62.5%)	40 (20.5%)	0.813
Strategy by smokers to avoid HWM				
I don't look at HWM	13 (31.7%)	28 (68.3%)	41 (21.0%)	0.334
I ignore HWM	32 (34.8%)	60 (65.2%)	92 (47.2%)	
Transfer cigarette to pack without HWM	12 (32.4%)	25 (67.6%)	37 (19.0%)	
I cover HWM pack with a paper	13 (52.0%)	12 (48.0%)	25 (12.8%)	

but most ignore them and these messages were less likely to convince them to quit smoking. Even, one-third participants cover cigarette packs to avoid looking these messages.

Our study is one of few studies investigated this issue. The insights of important stakeholder (a cigarette smoker), was insufficiently examined. We used a comprehensive interview form covering all aspects beginning from purpose of these messages to the extent to which these messages are able to convince smokers to understand the purpose of messages, and whether these messages are effective enough to warn them about the deleterious effects. The results of this study should be interpreted after considering few limitations: this is a cross-section study where we used non-probability convenient sampling technique; therefore, results may not be generalized fully to wider population. Furthermore, no association of socio-demographic characteristics and perception themes were analyzed due to reduced sample size and since this may suffer from reverse causality. Females were not included in the sample, which may provide interesting results since females may perceive cigarette smoking differently due to their unique cognitive and emotional domains. Another limitation of this study is that we did not ask the effect of these messages over time, whether its impact waxes or wane with time.

Results of this study varies with the findings of other similar studies. For instance, Hall et al. in their study conducted in USA found that pictorial warnings created negative affect, message reactance and help in quitting (all $P<0.001$), but did not reduce perceived risk (ie, perceived likelihood and severity of harms of smoking).[3,12] However, their conclusion was in consistent with our findings, that is, The opposing associations of negative affect and reactance on perceived risk may explain why pictorial warnings did not lead to observable changes in perceived risk.[3] Similarly, Ratih and Sussane in their review of literature on perceived effectiveness of health warning messages concluded that Pictorial health warnings perceived as more effective in deterring smoking initiation among non-smokers and as well as in stimulating smoking cessation among smokers.[13] However, perception of our participants is different since they did not find these messages convincing them to quit smoking. Findings of Fong et al.[14] are consistent with our results that the pictures are more effective than text only. Further they stated that pictorial warnings would significantly increase the impact of health warnings in China.[14]

Smoking has been around for centuries and has been a part of several cultural or religious ceremonies and events. From chewing tobacco for many years to starting smoking it in the mid of 2nd millennium, smoking became a monetary standard in the 1600s.[15] During the 1920s the first medical reports linking smoking to lung cancer began to appear. Many newspaper editors refused to report these findings as they did not want to offend tobacco companies who advertised heavily in the media.[16] The WHO Framework Convention on Tobacco Control is the first legal instrument aimed at improving population health developed by WHO using its constitutional authority in global health in 1999. The objective is to protect present and future generations from health, social, environmental and economic consequences of smoking. The framework convention is the first and most crucial step in controlling use of tobacco. This convention was endorsed by member states on 21st May 2003.[6] The convention encourages countries to apply tobacco tax and price, arrange smoke free area, regulate tobacco advertising and implement health warning messages on cigarettes packages. The FCTC policy is one of the policies that have shown to be effective as they are a direct means of communicating the risks associated with smoking. Moreover, the structure of the health warning labels plays an important role in their effectiveness. Accordingly, larger and clear text placed on the front of packs with pictures covering at least 50% of both sides of the package, increases the chances of smokers noticing the labels.[7]

Pictorial warnings are especially important in countries with low literacy rate. These give graphical information to the smokers raising knowledge about health risks. These make potential to cause disease more real to the smoker. A person retains a pictorial information better than the text only information as he is easily able to comprehend the effects on himself. Size of pictorial warning also plays role such as a large picture is more effective than a small picture. Similarly, label on the front is more effective in passing the message than the label on the back or the sides.[17] Graphic pictorial/ multimedia health warnings that depict cosmetic and functional distortions were perceived as effective anti-smoking messages. Compared to text-only warnings, pictorial warnings elicited more negative affect, which was associated with greater quit intentions. Pictorial warnings may also elicit message reactance, defined as cognitive and emotional resistance to a health message in response to a perceived threat to one's freedom.

Conclusion

Labelling health-warning messages on cigarette packs is less effective in communicating hazardous effects of cigarette smoking to male adults in a metropolitan city of Pakistan. This strategy alone will not be able to provide a deterrence against smoking cigarettes and should be complimented by other preventive measures such as cigarette selling points regulations, high pricing, smoke alternatives, quit programs and developing support groups.

References

1. Saqib MA, Rafique I, Qureshi H, Munir MA, Bashir R, Arif BW, Bhatti K, Ahmed SA, Bhatti L. Burden of tobacco in Pakistan: findings from global adult tobacco survey 2014. Nicotine and Tobacco Research. 2018 Aug 14;20(9):1138-43.
2. Ahmad F, Khan Z, Siddiqi K, Khan MN, Kibria Z, Forberger S, Bauld L, Kanaan M, Zeeb H. Awareness, perceptions of and compliance with tobacco control policies among naswar vendors in Khyber Pakhtunkhwa Pakistan. Tobacco Control. 2022 Dec 1;31(e2):e111-7.
3. Hall MG, Sheeran P, Noar SM, Boynton MH, Ribisl KM, Parada Jr H, Johnson TO, Brewer NT. Negative affect, message reactance and perceived risk: how do pictorial cigarette pack warnings change quit intentions?. Tobacco control. 2018 Oct 1;27(e2):e136-42.
4. Ratih SP, Susanna D. Perceived effectiveness of pictorial health warnings on changes in smoking behaviour in Asia: a literature review. BMC public health. 2018 Dec;18(1):1-6.
5. World Health Organization. WHO report on the global tobacco epidemic, 2008: the MPOWER package. World Health Organization; 2008 Feb 11.
6. Murray CJ, Lopez AD. Alternative projections of mortality and disability by cause 1990–2020: Global Burden of Disease Study. The lancet. 1997 May 24; 349 (9064): 1498-504.
7. Shibuya K, Ciecierski C, Guindon E, Bettcher DW, Evans DB, Murray CJ. WHO Framework Convention on Tobacco Control: development of an evidence based global public health treaty. Bmj. 2003 Jul 17;327 (7407): 154-7.
8. World Health Organization. WHO framework convention on tobacco control: guidelines for implementation of article 5. 3, Articles 8 To 14. World Health Organization; 2013.
9. Bekki K, Inaba Y, Kunugita N. WHO framework convention on tobacco control (FCTC) article 11: Packaging and labelling of tobacco products. Nihon Eiseigaku zasshi. Japanese Journal of Hygiene. 2015 Jan 1; 70(1): 24-32.
10. Jradi H, Saddik B. Graphic warnings and text warning labels on cigarette packages in Riyadh Kingdom of Saudi Arabia: Awareness and perceptions. Annals of thoracic medicine. 2018 Jan;13(1):22.
11. Peters E, Shoots-Reinhard B, Evans AT, Shoben A, Klein E, Tompkins MK, Romer D, Tusler M. Pictorial warning labels and memory for cigarette health-risk information over time. Annals of Behavioral Medicine. 2019 Apr;53(4):358-71.
12. Noar SM, Francis DB, Bridges C, et al. Effects of strengthening cigarette pack warnings on attention and message processing: A systematic review. J Mass Comm Q. 2017; 94:416–442.
13. Hammond D, Fong GT, McDonald PW, Cameron R, Brown KS. Impact of the graphic Canadian warning labels on adult smoking behaviour. Tob Control. 2003; 12:391–395.
14. Ratih SP, Susanna D. Perceived effectiveness of pictorial health warnings on changes in smoking behaviour in Asia: a literature review. BMC public health. 2018 Dec; 18(1):1-6.
15. Fong GT, Hammond D, Jiang Y, Li Q, Quah AC, Driezen P, Yan M, ITC China Project Team. Perceptions of tobacco health warnings in China compared with picture and text-only health warnings from other countries: an experimental study. Tobacco control. 2010 Oct 1; 19(Suppl 2):i69-77.
16. Zaidi S, Bikak AL, Shaheryar A, Imam SH, Khan JA. Perceptions of anti-smoking messages amongst high school students in Pakistan. BMC Public Health. 2011 Dec;11(1):1-5.
17. Mir H, Buchanan D, Gilmore A, McKee M, Yusuf S, Chow CK. Cigarette pack labelling in 12 countries at different levels of economic development. Journal of public health policy. 2011 May;32(2):146-64.