ASSESSING THE SYMPTOMS OF BORDERLINE PERSONALITY DISORDER IN YOUNG ADULTS STUDYING IN PRIVATE UNIVERSITIES OF LAHORE.

[*]Hafsa Hayee[1]; Tahira Raana[1]; Imran Ijaz Haider[2]

[1] Department of Human Development & Family Studies. University of Home Economics, Lahore. Pakistan.

[2] Department of Psychiatry and Behavioral Sciences, Fatima Memorial Hospital, Lahore, Pakistan

***Corresponded: E.mail: hafsa.hayee@gmail.com**

ABSTRACT

Borderline Personality Disorder (BPD) is on focus due to its intense and long-lasting symptoms. BPD is considered a psychological disorder of young adults, as its major symptoms start revealing at the beginning of young adulthood in the early 20s. The aim of this study was to assess BPD and its symptoms in the young population of students achieving higher education in private universities of Lahore, Pakistan. A stratified sample of 700 university going students was collected from three high ranked private universities of Lahore. The sample was collected and assessed through Borderline Personality Inventory (BPI-cut 20). The results obtained through the descriptive statistics revealed the high percentage of BPD in young adults (62%). Further, a high percentage of BPD was observed in a group of students ages 18-21 years (63%). The four factors of BPD: Primitive Defense Mechanism, Identity Diffusion, Fear of Closeness, Self-Mutilation, and Impulsivity were equally found among the male and female samples. The independent sample t-test revealed the significant results obtained from the factor self-mutilation (Male: M=.21, SD=.405 and Female: M= .14, SD= .346, t=2.350, p=0.019) and impulsivity (Male; M=.35, SD=.479 and Female: M= .403, SD= .021, t= 4.482, p= 0.000). The results of this study concluded BPD and its factors were frequently being found in young adults studying in universities. Further, no significant gender differences were observed other than in two factors self-mutilation and impulsivity. It is recommended that there is an essential need to promote the health and wellbeing of the young population of students especially studying in universities because the evidence suggests that they are at risk. They further need assessment and intervention.

Keywords: Borderline Personality Disorder; Young Adults; Education; Student; University

INTRODUCTION

Modern research outcomes have contributed to an enhanced understanding and treatment of Borderline Personality Disorder (Falk Leichsenring, Leibing, Kruse, New, & Leweke, 2011).

BPD is among the most frequently studied Personality Disorders (PDs) in psychological settings, less is known about its prevalence, association, and disability in general population samples (Grant et al., 2008). Studies on Borderline Personality Disorder (BPD) conducted on a small sample in community and a normal population that is based on short survey and descriptive in nature are limited (Deasy, Coughlan, Pironom, Jourdan, & Mcnamara, (2015); Korsgaard, Torgersen, Wentzel-Larsen, & Ulberg, (2016).

BPD is considered a disorder involving an unescapable malfunctioning of the emotions. BPD affects cognitive and behavioral domains, causing continuous mood disorder, disturbed mind functioning cognition, and self-harm (Lieb, Zanarini, Schmahl, Linehan, & Bohus, 2004). BPD considered to abruptly affect a person's social and personal life. BPD is a prolonged and intense disorder and believed to be connected with biological and environmental aspects. According to the American Psychiatric Association's (APA) Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; APA, 2000), for identification of BPD, the individual must have five of nine criteria which can be further arranged into four areas of problematic functioning (Lieb, Zanarini, Schmahl, Linehan, & Bohus, (2004).

The marked symptoms of BPD include impulsivity, self-destructive behavior such as self-mutilation, self-injury, and suicidal behaviors (Chanen & McCutcheon; 2013). The number of suicidal attempts ranges around 38% to 73% occurred in persons with BPD, and reportedly about 10% died due to suicidal attempts. Consequently proposing BPD as one of the causes of highest death rates of all psychological conditions (Black, Blum, Pfohl, & Hale, (2004); Zanarini et al., (1998).

Since 1980, the time of the initial identification of the personality disorders, it was specified that BPD was more common in women than men with ratio 3:1 female to male gender (Association, 2013). Whereas according to the latest studies by Grant et al., (2008) proposed that BPD found in both, males and females. Further, it was reported that BPD was equally prevalent in men and women in the normal as well as in clinical populations. These findings are supported by research evidence such as Johnson et al., (2003); Patterns, (2011); Zlotnick & Rothschild, (2002).

There were no gender differences observed in self-harming behaviors, they were equally prevalent in both males and females (Marchetto, 2006). Whereas, there were gender differences related to impulse patterns were observed. Men proved more substance abuse, antisocial features, and intermittent explosive disorder, and women showed more eating disorders. Both genders presented for treatment with equal levels of emotional distress (Pryjmachuk & Richards, 2007). The early signs of BPD can clearly be observed at the beginning of early adulthood in the 20s until the start of middle adulthood (Grant et al., (2008); White, (2016); Johnson et al., (2003); Lenzenweger, Lane, Loranger, & Kessler, (2007); Paris, (2005).

BPD started to be diagnosed with clear symptoms in young adulthood. Those patterns must persistent, and must be evident at the beginning of early adulthood (Sayrs & Whiteside, 2006). Consequently suggesting that the majority of the college students considered the high-risk than other age groups. Further, it was suggested that college students had more chances of psychological suffering including symptoms of BPD, than non-students and community sample (Deasy, Coughlan, Pironom, Jourdan, & Mcnamara, (2015); Taylor, James, Bobadilla, & Reeves, (2008); Zivin, Eisenberg, Gollust, & Golberstein, (2009). Though the estimates could vary regionally, up to 17.1% of college students have assessed with evidence of clinically noteworthy symptoms of BPD (Sauer & Baer, 2010).

According to the report of the World Health Organization (2010), several lifestyle behaviors are identified as health-risk behaviors (Organization, 2014). College years often overlap with the change from adolescence to adulthood considering the time period when young people make major lifestyle decisions, that once established would lead to later stages of adulthood, with long-lasting impact on one's life (Bell & Lee, 2006). Thus according to the findings of one of the major reports in most of the countries, more than 50% of young adults expected to enter university, and around 20% considered to enter vocationally oriented programs (Education at a Glance, 2012). Thus this population of higher-level students considered more at risk and suspected to experience the emotional disturbance and at-risk behaviors (Deasy et al., 2015).

The factors that contribute to a psychological disturbance in students could be due to academic and educational pressure. Other stressors could be the major change from home to college and a step into young adulthood (Kwan, Cairney, Faulkner, & Pullenayegum, (2012); Lawrence, Allen, & Chanen, (2010). Exploring and understanding the psychological and emotional issues of the young population especially of a developing country like Pakistan is an important and major concern. As conferring to the evidence of literature in a study by Shaikh et al., 2017 it was suggested that race, gender, stress, and unfavourable social environments influence the growth of BPD. Therefore the aim of this present study was to assess Borderline Personality Disorder (BPD) and its factors (Primitive Defence Mechanism, Identity Diffusion, Fear of Closeness, Self-Mutilation, Impulsivity) among young adults that were enrolled as undergraduates in the private universities of Lahore, Pakistan.

METHOD

This current study was a descriptive quantitative cross-sectional survey conducted to target the young population of undergraduates studying in private Universities of Lahore, a capital state of Punjab, which is the most populated province of Pakistan. The researcher collected a list of top-ranked private universities of Lahore and selected purposively the three universities situated in the mid of Lahore city. The most populated department with a large number of undergraduates was selected to collect data. A further sample was gathered through a stratified sampling technique. The admission and enrollment

record of the undergraduate students was obtained from the administration and selected departments. Lists of the male and female students and relative sections were formulated accordingly. Proportions of strata grouping were performed through statistical calculation. The process of data collection was started by approaching to the listed participants.

The researcher formulated a self-reported structured questionnaire composed of a standardized psychological assessment tool named: BPI-cut 20, with basic demographic information like name, roll number, age, gender, name of institution, department, and health status. A printed copy of the composed questionnaire was distributed among the participants, which included a copy of written consent and proper instructions about filling the questionnaire. The inclusive criteria of the study were; undergraduates enrolled in the morning classes of the selected departments, ages between 18-25 years at the time of data collection, and single in marital status. Any of the participants mentioned with suffering from major health illnesses were excluded from data collection. Further missing information in demographic forms and incomplete questionnaires was also excluded. After observing all the inclusive and exclusive criteria an approximate data of 700 students, was collected as a sample and entered in statistical software to prepare for data analysis.

In order to assess BPD, the researcher used a brief version of the assessment tool Borderline Personality Inventory (BPI) developed by Leichsenring in 1999s. The self-reported validated brief version of BPI- cut 20 is constructed of twenty dichotomous closed-ended questions, with the option of yes or no with each statement. It helps in diagnosing BPD. According to the manual guide by Leichsenring, the cut-off score to diagnose symptoms of BPD with help of BPI-cut 20 is ≤10, it means the individual that scored equal to or greater than ten (≤ 10) will be considered suffering from BPD. Whereas the score less than ten (> 10) indicates minimal symptoms of BPD which comes under the category of normal.

The items of BPI cut 20 is subdivided into its four traits. The potential score of each factor of BPI cut 20 is given with it is the name here; Primitive Defense Mechanism (0-2), Identity Diffusion (0-4), Fear of Closeness (0-3), Self-Mutilation (0-2), and Impulsivity (0-1). This scale was validated to be used among different age groups. The BPI-cut 20 was culturally tested and applied in several researches, some evidence were by Falk Leichsenring, Leibing, Kruse, New, & Leweke, (2011); Chabrol et al., (2004; Leichsenring, Kunst, & Hoyer, (2003). The researcher of the present study pilot-tested BPI cut 20 to culturally validate the required sample of the population. The Cronbach alpha value obtained from the pilot study ($\alpha \geq 7$) suggested that BPI cut 20 was acceptable to be applied to the selected population.

The researcher took permission from the Institutional Review Board (IRB) from one of the Health Institution of Lahore. The permission of data collection was taken from the authorities of each selected institution by presenting the goals and objectives of this study. Participants were verbally informed and their written consent was taken at the time of distribution of a hard copy of the questionnaire. The researcher personally distributed and collected the questionnaire forms and provided the ease of time and assistance in filling a form to the participants where needed. As this study contain personal information of participants, therefore the identity of the institutions and participants was assured to keep confidential, and will not be revealed to any third party.

RESULTS

This study was aimed to assess the BPD and its symptoms among university students' specifically young adults. BPD and its factors: Defense Mechanism, Identity Diffusion, Fear of Closeness, Self-Mutilation, and Impulsivity were assessed by BPI-cut 20. Descriptive statistics and independent-sample t-test were applied to obtain the required results. The sample composed of 700 students. There were 325 (46%) males and 375 (54%) females, with the minimum age eighteen years and maximum age twenty-five years old (18-25 years). As the study was revolved around young adults, enrolled in undergraduate degree programs, thus the majority of the participants were of age group between 18-21 years while participants were of ages between 22-25 years.

Table 1: The estimated prevalence of Borderline Personality Disorder (BPD) in University students.

Characteristic	Non-BPD		BPD		Total	
	n	%	n	%	N	%
Overall	267	38.1	433	61.9	700	100
Male	125	38.5	200	61.5	325	100
Female	142	37.9	233	62.1	375	100
18-21 years	162	37.4	271	62.6	433	100
22-25 years	105	39.3	162	60.7	267	100

Note: The results have been obtained by using a Borderline Personality Inventory (BPI cut-20). According to its cut off values; when the score is less than ten (<10) it is considered with minimal symptoms of BPD that is equal to Normal. While score greater equal to ten (≥10) is considered with evident Borderline Personality (BPD) Symptoms.

According to table 1, Non-BPD is a category with minimal symptoms of BPD which is considered normal. While results presented in the category of BPD presenting the sample with evident traits of BPD. The results suggested that the majority (62%) of the young students were assessed with clear symptoms of BPD, females (62%), and males (61%). Among the age groups, the majority of the university students showed the traits of BPD. whereas, the majority (63 %) of the age group between 18-21 years revealed more traits of BPD.

Table 2: The estimated prevalence of factors of Borderline Personality Disorder (BPD) in university students.

Factors of BPD	Range of Score	Overall		Gender Male		Female		Independent Samples t-test	
		M	SD	M	SD	M	SD	t	P
1:Primitive Defense Mechanism	**0-2**	**1.12**	**.75**	**1.10**	**.77**	**1.13**	**.74**	**-.66**	**0.507**
2: Identity Diffusion	**0-4**	**2.43**	**1.13**	**2.37**	**1.20**	**2.49**	**1.06**	**-1.34**	**0.184**
3: Fear of Closeness	**0-3**	**1.15**	**.67**	**1.13**	**.69**	**1.13**	**.69**	**-.64**	**0.519**
4: Self-Mutilation	**0-2**	**.17**	**.37**	**.21**	**.40**	**.14**	**.34**	**2.35**	**0.019**
5: Impulsivity	**0-1**	**.27**	**.44**	**.35**	**.47**	**.40**	**.02**	**4.48**	**<.001**

Note: N= 700, Male: n=325, Female: n=375, p= Significance value <0.05, confidence interval = 95%, BPD, and its factors were assessed by using Borderline Personality Inventory (BPI cut 20).

According to the table 2, the factors of BPD: Primitive Defense Mechanism (M=1.12, SD= .754), Identity Diffusion (M= 2.43, SD= 1.13), Fear of Closeness (M= 1.15, SD= .676), Self-Mutilation (.17, SD=.376), Impulsivity (M=.27, SD= .446) were correspondingly widespread among young adults. Additional the presentation of independent sample t-test revealed significant difference in the results of males and females obtained by the factor self-mutilation (p-value= 0.019) and impulsivity (p-value= 0.000).

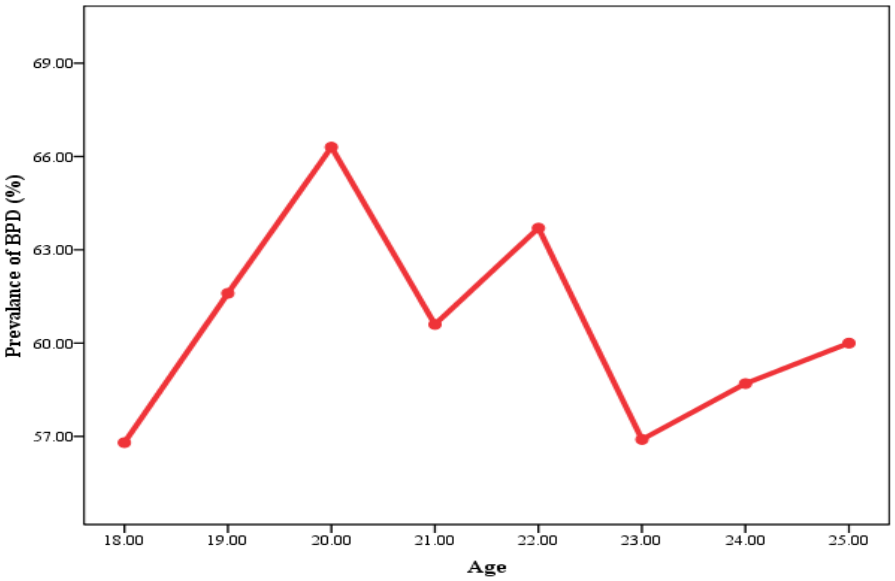

Figure 1: BPD among different age groups of young adults

According to the graphical presentation of the prevalence of Borderline Personality Disorder (BPD) among different age groups, in figure 1. It was evident that most of the cases of BPD were reported in a group of students around 20 years old in age. Therefore, BPD was at a peak at the age of 20 among young adults.

DISCUSSION

The present study was aimed to assess Borderline Personality Disorder (BPD) and its primary symptoms among young adult specifically focusing on undergraduate studying in private universities of Lahore.

According to the first outcome of this current study, BPD was found in the majority of young adults. The result was supported by the clear evidence found in the previous research by IsHak et al., (2013) discussing the high percentage of BPD in the age of 20s. The research by Shaikh et al., (2017) suggested that race, gender, stress, and socially unfavorable social environments possibly the reason for the high rate of BPD. The results of the current study further explored that the factors of BPD primitive defensedefence mechanism, identity diffusion, fear of closeness, self-mutilation, and impulsivity, were found in the majority of the young adults. These results of the current study were supported with strong evidence of the previous researches by Deasy, Coughlan, Pironom, Jourdan, & Mcnamara, (2015); Taylor, James, Bobadilla, & Reeves, (2008); Zivin, Eisenberg, Gollust, & Golberstein, (2009) that concluded in their studies that BPD and its symptoms can evidently be observed at young adulthood.

Another result of the current study suggested that BPD and its symptoms were more prevalent in the young adults of age group between 18-21 years. Relatively making 20s more common age of prevalence of BPD. These results of the current study were immensely supported with strong evidence of quoted literature signifying that traits of BPD could clearly be observed at the beginning of early adulthood in the 20s (Grant et al., (2008); White, (2016); Johnson et al., (2003); Lenzenweger, Lane, Loranger, & Kessler, (2007); Paris, (2005). According to the results of this current study self-mutilation and impulsivity, were the factors that showed a significant difference in male and female young adults. The current results of the study were supported by the research evidence given in literature by Marchetto, (2006) & Pryjmachuk & Richards, (2007) that focused on the gender-wise differences in that occurrence of impulsivity and self-mutilation as traits of BPD.

According to the obtained results of this current study, it is recommended to focus on providing service and intervention programs to explore more about psychological and emotional disturbances among university students. Student counselling services need to provide treatment for students with psychological issues. An examination of lifestyle and its relationship with psychological issues and coping with them among higher education students needs to be explored in further studies.

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MICROBIAL ANALYSIS OF DRINKING WATER AND WATER DISTRIBUTION SYSTEM OF URBAN LAHORE

***Nazma Malik[1] Muhammad Nawaz Chaudhry[2]**
[1]Department of Family and Consumer Sciences, University of Home Economics Lahore
[2]Department of Earth and Environmental Sciences, University of the Punjab, Lahore
***Correspondence, email: nazmamalik@live.com**

ABSTRACT

Human health is the most important ingredient for a nation's progress, prosperity and well-been but unfortunately it has not been accorded its due priority. Therefore, when going to deal with the water of Lahore, it was considered essential to probe and find out the state of its quality. The main objective of this article is to highlight microbial contamination of drinking water in the selected localities of Lahore. Furthermore, this study will be helpful for researchers and administrative agencies to initiate relevant studies and develop new policies to protect further deterioration of water supply with pathogenic microbes and ensure clean and safe drinking water to the public in Pakistan. Five localities were selected from Lahore for the study, namely Lahore Cantonment Board (LCB) Walton Cantonment Board (WCB), Gulberg, Defense Housing Authority (DHA) and Model Town Society (MTS). These localities have their own tube wells for the supply of water to their residents. To measure the quality of tap water, samples were taken from 2 tube-wells in each locality at different intervals, tested in a water testing Lab for chemical and microbial contamination. The results were compared with the WHO standards and averaged out. MTS and LCB have too numerous to count total coli forms. WCB and Gulberg are higher, in Arsenic content. Gulberg is touching the maximum level of iron content, followed by DHA.

Keywords: microbial analysis, urban ground water, domestic use, Lahore

INTRODUCTION

Lack of resources and awareness are the major cause of water pollution specially in countries like Pakistan (Ahmed et al. 2010). A large number of serious diseases are caused by impure and unclean water. Cholera, diarrhea are spread by S contaminated water, and all types of hepatitis are also caused because of it (Jabeen et al, 2011). Contaminated water is very harmful, particularly for the children health. The mortality rate among the children in Pakistan is very high and is mainly due to unsafe drinking water (Azizullah et al, 2011). Efforts are on to control this menace at social and government level, but adequate measures have not been taken so far due to both lack of will and lack of finances. Microbial communities play an important role in the aquatic environmental conditions as they can cause different diseases as pathogenic bacteria (Janjua et al., 2009). Various chemical parameters including pH, Total dissolved solids (TDS), Chlorides (Cl), Fluorides(F), iron, calcium, magnesium, hardness and alkalinity were measured by standard methods. Everybody wants to drink a totally bacteria free water. Bacteria free water is clean, tasteless or odour less. It must be remembered that the raw water in its natural state would rarely have these qualities.

METHODS

To measure the quality of water through a laboratory test, 10 samples were taken, 2 from one tube-well in each locality at different intervals and the results were averaged out. Thus two tube wells were used from each selected locality to analyze and prepare a detailed average result sheet. 100 ml sterilized glass bottles according to standard methods (APHA, 2012). pH, and TDS were measured onsite by pH meter (Hanna pH meter sensION 1) and conductivity meter respectively. Total Alkalinity as mg of CaCO3 was determined by acid titration method. Chloride , Fluoride and hardness values were measured by volumetric analysis of water samples (APHA, 2005). Microbial analysis of the water samples was carried out within 24 hours of sample collection. For identification of bacteria, various characteristics including

colony morphology, Gram reaction, citrate utilization, catalase, and oxidase tests were performed. For heavy metals analysis, clean plastic bottles were used for storing samples which were later kept overnight after adding 5ml HNO_3. Arsenic analysis was done onsite using Arsenic kit (Hanna, 2100).

Results

The Table below depicts the average of the results obtained through this process along with WHO guideline where available:

Table 1: Microbial Analysis of Drinking Water of Selected Localities of Lahore

S.N	Parameters	Units	WHO Guideline	Gulberg	DHA	Model Town	LCB	WCB
1	pH	……	6.5-8.5	8.01	7.6	7.4	7.64	7.38
2	Total Dissolved Solids	mg/l	1000.0	369.0	675	524	458	378
3	Iron Total	mg/l	0.3	0.3	0.18	0.01	0.03	0.05
4	Calcium Hardness	mg/l	…..	117.0	110	61	78	70
5	Magnesium Hardness	mg/l	…..	149.0	138	85	104	94
6	Total Hardness	mg/l	…..	266.0	248	146	182	164
7	Sodium	mg/l	200	73.0	152.3	192.3	96.7	78.4
8	Potassium	mg/l	….	2.5	3.4	3.5	3.2	2.8
9	Arsenic	mg/l	0.01	0.1	0	0.005	0.014	0.029
10	Chloride	mg/l	250	114.0	188	18	25	36
11	Fluoride	mg/l	1.5	0.61	0.54	0.58	0.48	0.46
12	Sulphate	mg/l	250	114.0	178	96	104	80
13	Total Colony Count**	cfu/ ml	500	+++*	+++*	+++*	+++*	+++*
14	Total Coliforms**	cfu/100 ml	0	0	0	+++*	+++*	0
15	Fecal E. Coli**	cfu/100 ml	0	0	0	0	0	0

***too numerous to count**

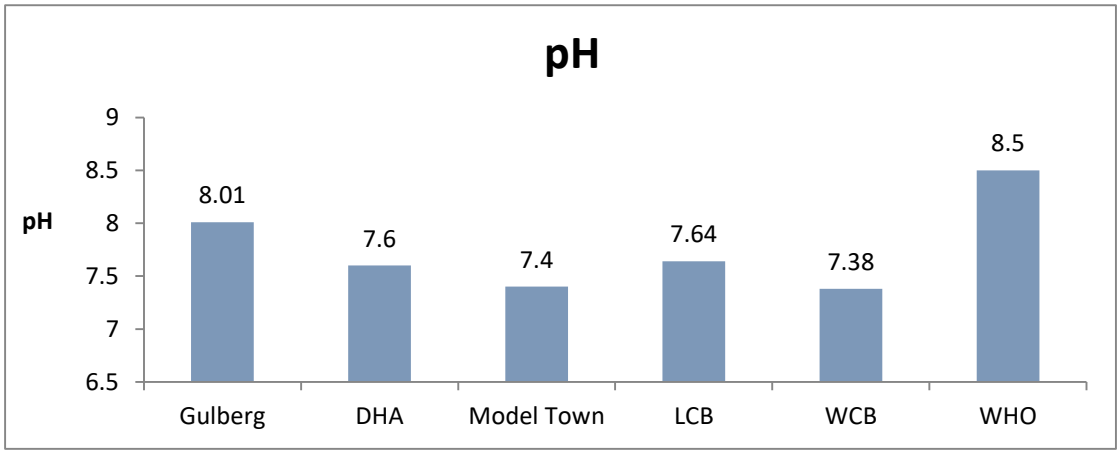

Figure 1: Level of pH

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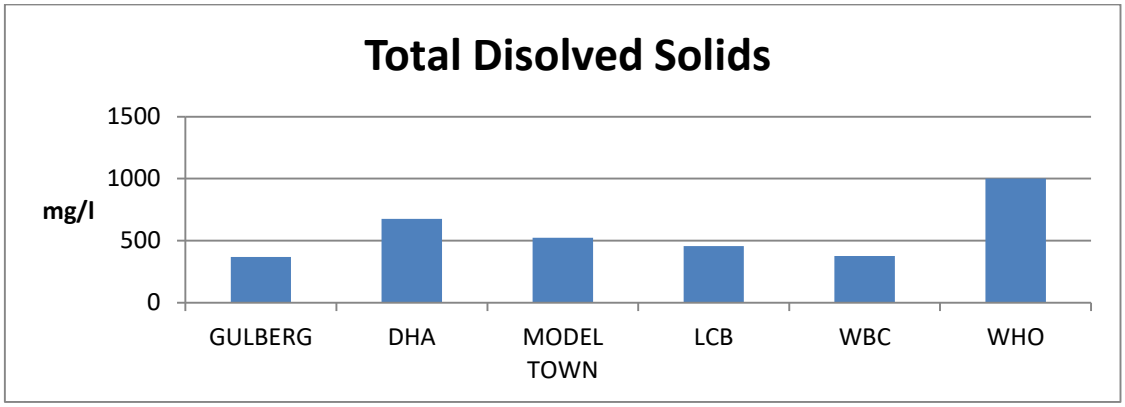

Figure 2 : Level of TDS

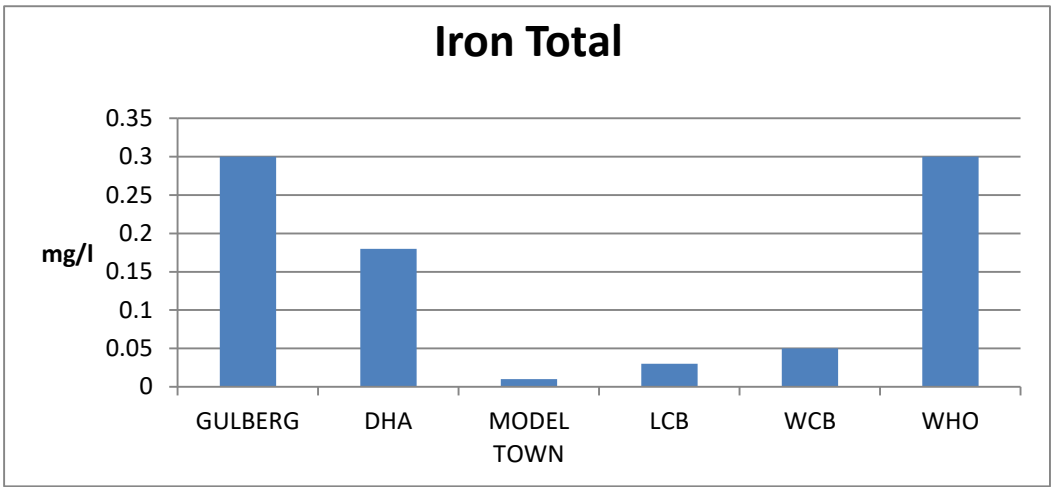

Figure 3 : Level of Iron

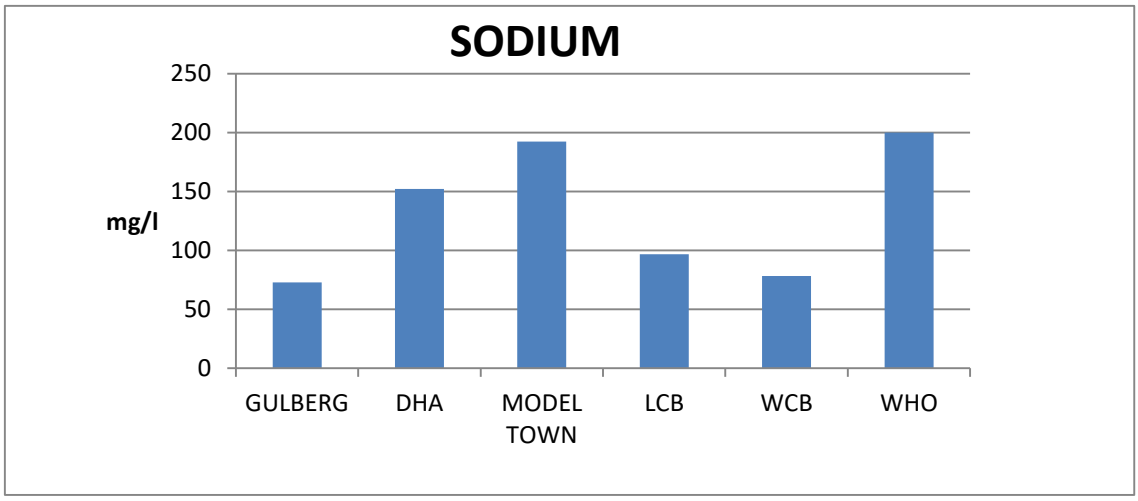

Figure 4: : Level of Sodium

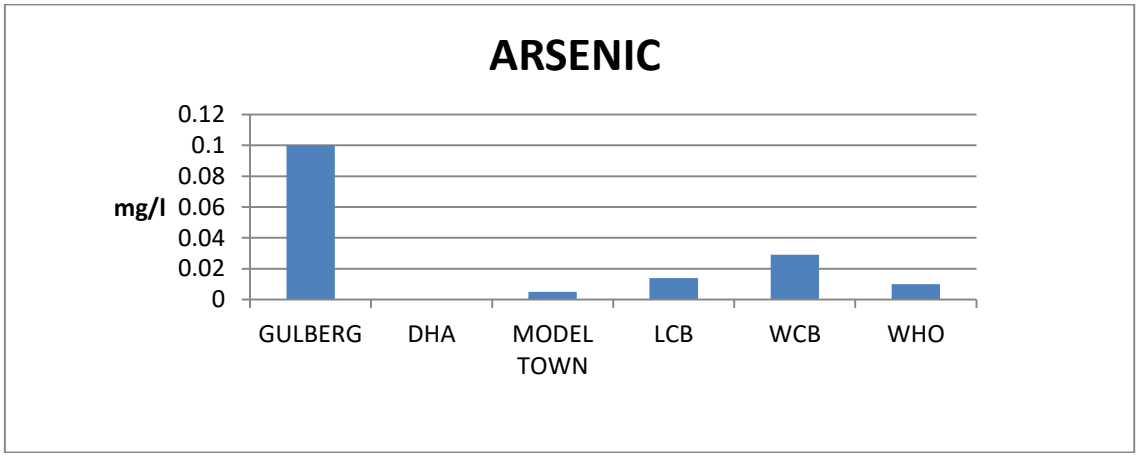

Figure 5: : Level of Arsenic

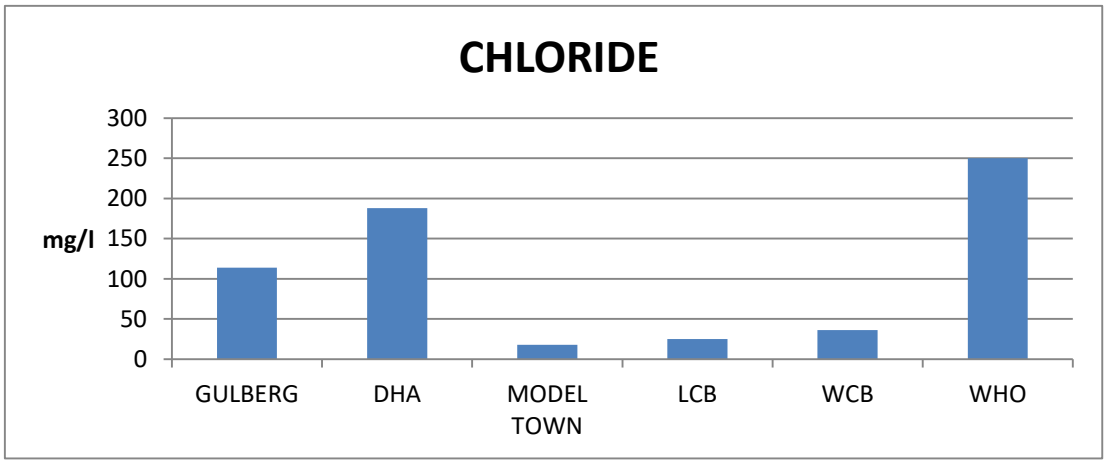

Figure 6 : Level of Chloride

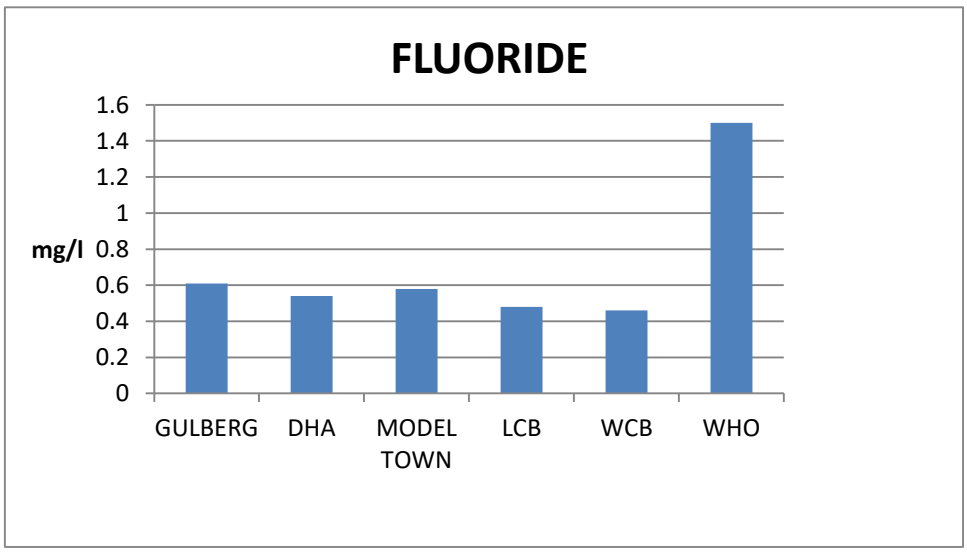

Figure 7 : Level of Flouride

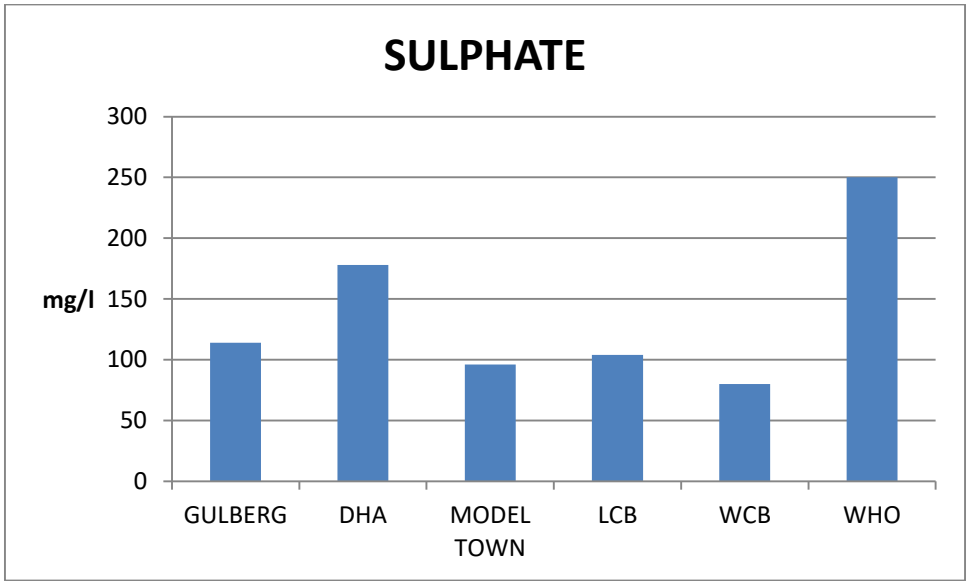

Figure 8: : Level of Sulphate

DISCUSSION

The pH scale of all five localities remain within prescribed limits of WHO, which is from 6.5-8.5. An outcome above 7 falls in the category of soft water. Gulberg is slightly ahead of the rest while MTS is much closer to the neutral state. Apparently there is no problem with pH scale of water. The state of total dissolved solids (TDS), according to the United States Environmental Agency (EPA) is classified as a secondary contaminant. It is measured in mg per unit value of water (mg/l). For drinking water the maximum concentration level set by EPA is 500mg/l. The panel of experts while examining the palatability of drinking water and its relationship with the TDS level has rated, "Excellent, less than 300 mg/l; good, between 300 - 600mg/l ; fair, between 600-900 mg/l; poor, between 900-1200mg/l; unacceptable, greater than 1200 mg/l". Water having less than 300 mg/l level of TDS would have totally flat taste and would not be palatable (WHO 1996). WHO has allowed the permissible level up to 100mg/l. All our samples produce water of good quality of water with DHA slightly shooting beyond this level. DHA is a new area and with a passage of time an extraction of more water it is likely to stabilize. Iron concentration in water is seldom found greater than 10mg/l. The permissible level as indicated by WHO is 0.3 mg/l. Gulberg is touching the maximum level followed by DHA. MTS is at the lowest ebb. Reason for higher contents of iron in Gulberg needs investigation. Even the corroded iron pipes of tube wells can cause this escalation. Sodium ions are ubiquitous in water. In some countries, levels can exceed 250mg/l. It could be due to saline intrusions, mineral deposits or sewage effluents (WHO 1996). All our samples are well within the limits with MTS leading on the higher side. Least iron contents and best sodium contents in MTS water should have some cogent explanation. Arsenic is a poison if found in drinking water can cause severe skin diseases including lung, kidney and bladder cancers, hypertension and even diabetes (C.Hopenhyn, 2006) . Arsenic is among the 10 chemicals of major public health concern according to WHO. EPA has set an arsenic maximum contaminant level (MCL) for public supplies at 0.010mg/l or 10 micrograms/l or 10 parts / billion. arsenic concentration according to an article, " Arsenic Contamination of Ground Water by Shankar et al", published on 14 Oct 2014, is contamination of ground water due to natural and/ or anthropogenic sources. DHA and MTS are safe and so is LCB but the results of WCB and Gulberg are higher than the limits.

Chloride is essential for human health but its concentration in excess of about 250 mg/l can change the taste of water. All samples have produced satisfactory results with DHA leading and MTS lagging at the tail. Chloride in MTS water can be increased if need be by its treatment with chloride and chlorine. WHO allows concentration of fluoride in drinking water up to 1.5 mg/l. Any number above that is considered unhealthy because the excessive use and long exposure to fluoride causes brain damage and resistance to insulin. All the samples from our study area were found to be within limits. Fluoride pollution generated

by industries can also contaminate water beyond the desired level. Drinking water has contents of sulphate is the dissolved form. To control the algae in the raw water as well the supplies meant for public consumption, a treatment by copper sulphate is required (McGuire MJ et al, 1984). Fresh water sulphate concentration varies from 0-630 mg/l and only 3% of the total water sampled contained sulphate level beyond 250 mg/l (EPA, 1999a). Daily human intake of sulphate is average 500mg. It is derived from drinking water, food and air, food being the major source. Results achieved in our study fell within the permissible limits.

CONCLUSION

Almost all the parameters (besides Arsenic and microbiology) were found to be within the prescribed limit of WHO which is an encouraging sign. Arsenic is a toxic metal and causes severe poisoning, if taken on regular basis as it bio-accumulates in the body. The source of arsenic in the ground water may be natural and also anthropogenic, as the ground water gets recharged through rivers which are being polluted by the industrial waste. The presence of bacteria in all the samples is alarming as it indicates very poor quality of water and calls for immediate measures to be taken to resolve this critical issue. The bacteria (total colony count) are beyond limits in all the samples, indicating organic contamination that may be occurring due to numerous sources. The presence of coli-forms in two samples is much too alarming that indicates sewerage contamination of the ground water. It indicates the absence inadequacy of appropriate sewerage channels. The two localities where the coli-forms are present beyond count are MTS and LCB. Both these localities have soakage pits systems. The soakage pits system allows downward percolation of water to the aquifer, thus causing ground water contamination. Only recently some waste water channels have been added. MTS and LCB happen to be the oldest localities among the selected five localities.

The most worrisome issue seems to be the presence of Colony Count and Coli forms in abundance. Colony counts are too numerous to count in all the five localities. MTS and LCB have too numerous to count total coli forms as well. It indicates the extent of fecal and organic matter present in water. According to the laid down quality standard of water it should be completely free from any pathogens. Bathing and swimming pool water can have 200 colonies and the recreational water about 1000 colonies/100 ml (WHO, 2006). The main source of pathogens in drinking water is from human and animal waste. Sewage discharges, improper septic treatment, animal manures, water runoffs and wild life beside the poor well construction can increase the risk of ground water contamination. Maximum acceptable concentration for drinking water is none detectable/ 100ml. Presence of fecal material may cause diseases related with bacteria, viruses and parasite including nausea, vomiting and diarrhea. It may affect lungs, skin, eyes, nervous system, kidney and liver. It requires proper planning and regular maintenance system of the water supplies. Water must be boiled at least for 1 minute and should be treated by adding chlorine.

The problem of receding water table and deteriorating water quality makes it too critically adverse for living conditions to be sustainable. It is an immediate need that a through survey is carried out (not part of this study) to continuously monitor the ground water quality of Lahore in order to ensure the provision of safe drinking water to its population. The changes in climate and other environmental factors makes it mandatory for the municipal authorities and governmental agencies to maintain an up to date record of varying states of underground water. Safe water is essential for human health, progress and prosperity and it must be accorded its due importance.

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