Research Article

Exploring the Predictors of Health Literacy in Communicable Diseases: Evidence from the Pakistan Demographic & Health Survey (PDHS) Data

Asma Ihsan[1*], Shahid Adil[2]

[1]Department of Health Informatics, Punjab Economic Research Institute, Punjab
[2]Department of Health Sciences, Punjab Economic Research Institute

ABSTRACT

Information on the transmission of communicable diseases is vital for disease prevention and control, yet this information is not frequent in Pakistan. This study aims to investigate the awareness level of public in Pakistan regarding the transmission of three communicable diseases Tuberculosis (TB), Hepatitis B&C and Human Immunodeficiency Virus (HIV).To identify the knowledge and perceptions about TB, Hepatitis and HIV transmission among men and women, this study has utilized the data of Pakistan Demographic and Health Survey (PDHS) conducted in 2018. Bivariate and multinomial logistic regression has been performed to analyze the data to find the associated factors about knowledge of transmission of all three diseases. Covariate factors included area of residence (Provinces), Education, wealth status, age, urban/rural place, access to the mass media (television, internet) etc. The Knowledge about transmission of TB was found to be higher among people in Punjab [OR=1.12, men] and [OR=1.14, women]. The knowledge about transmission of hepatitis was found to be higher in Sindh [OR=1.74, men] and [OR=1.61, women]. People resided in rural areas had disadvantage with less knowledge regarding tuberculosis transmission compared to urban areas [OR=0.74, men] and [OR=0.86, women]. The findings also showed that socio-demographic factors such as education, place of residence and exposure to television and internet varied with knowledge on transmission of each diseases. People with the access to television and internet were also found more knowledgeable on tuberculosis and hepatitis transmission as compared to those who did not have access to these mass media sources. In case of knowledge of transmission about HIV/AIDS in respondents, the mass media exposure did not reflect good picture. Keeping in view the survey results, it is suggested that there is dire need to launch awareness campaigns to enhance the awareness level on transmission of TB and Hepatitis. But to enhance the knowledge of transmission about HIV/AIDS, face to face communication would be better option.

Keywords: Disease literacy, Communicable Diseases, , Mass Media Exposure

INTRODUCTION

With the increasingly complex health challenges, awareness regarding health issues and diseases is a need of the hour. Public awareness of infectious and non-infectious diseases plays an important role in disease prevention and control; a lack of reasonable knowledge of diseases leads to low detection rates, poor health outcomes, outbreak of health issues, interruption of treatment, discrimination and stigma. Therefore, understanding a disease plays a key role in the ability to prevent it, cope with it, lessening its debilitating effects or, eventually, overcoming it. As prevention is better than cure, therefore, taking necessary precaution and awareness are always better before the disaster strikes. Once the disease starts spreading,

the consequences can sometimes be troublesome, dangerous and to the extent of life threatening. Ultimately, creating health awareness and taking proper prevention against disease is of utmost importance. It is evident from the literature that unhealthy life style is the main reason of transmission of the diseases. It is also confirmed from the previous research studies that the diseases related to unhealthy lifestyle can be controlled and prevented [1,2,3].Health literacy, communication related to diseases and education are given more attentions globally in this perspective [4].

In the light of recognition that healthcare knowledge or health literacy is imperative for good health of people, it was very essential to examine the level of health literacy in people in Pakistan. Health and healthcare systems in Pakistan are witnessed to be slow and complexed with multiple issues [5]. There is a vast continuum of both communicable and no communicable diseases. Pakistan is facing a double burden of disease (BoD), by indigenous of hepatitis B and C as 7.6% affected individuals or about 12 million people are suffering from hepatitis B or C and each year adds about 150,000 new cases [6]. Likewise, Pakistan has the 5th highest tuberculosis (TB) burden in the world [6]. Furthermore, it is estimated that about 165,000 people were living with HIV in 2019 among which only 14.7 percent or 24,331 are registered with the National AIDS Control Program (NACP), this has been increased from 4500 in 2013 [6,7].

As signatory of SDGs declaration, Pakistan is committed to reduce the burden of communicable disease by 2030 i.e. to end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases. In order to establish effective prevention and treatment programs for these diseases, first it is necessary to access the level of awareness of people about these diseases. Publics' knowledge about signs and symptoms, modes of transmission of these diseases, and misconceptions about transmission may have an impact on health-care seeking behavior [8],. Lack of awareness about transmission of disease is one of the major reasons for majority of people to catch the infectious diseases [9]. Lack of knowledge about these diseases may contribute to the high level of burden in Pakistan [10].

Keeping in view the significance of public awareness about communicable diseases, this study aims to evaluate the knowledge of general public in four provinces of Pakistan regarding transmission of communicable diseases such as tuberculosis, hepatitis, and HIV/AIDS. It is very important to understand the determinants of disease literacy so that evidence based healthcare policies can be formulated and effective control and prevention of these diseases can be taken place. On the basis of these objectives, the following research questions are drawn.

1. What is the level of awareness about specific diseases?

2. What is the important determinant of awareness on transmission of specific diseases in Pakistan?

Review of the Literature

The literature has identified extensive studies with number of determinants contributing towards the lower level of disease literacy. This review of literature does not just focus on the awareness factors determined in the developed countries but also the developing ones so that we can understand how economies similar to Pakistan are attempting to increase the

level of public awareness regarding the diseases and their related health policies. Health of the public is dependent upon their knowledge about the disease, [11] in their research have highlighted that as the awareness regarding various diseases increasing, people start taking better precautions and are even able to have early interventions. All this prevents not only the disease incidence from rising but various health complications are also reduced. Similarly, in US Public Health Report (2017), stated that a major impediment in disease management and its treatment is lack of information about it among the people. The report found that there was very little knowledge about hepatitis not only among the general masses but even the health care providers and social services workers were not well equipped with the relevant and essential information. And due to this lack of important disease knowledge, the health care system was failing to prevent hepatitis, its complications and other related health issues like liver cancer. It is, therefore, pertinent to find out what is the level of awareness regarding diseases in Pakistan.

Similarly, another study conducted in Egypt found that mass media and friends were the main source of information for HIV. A study conducted in rural area of Zhejiang (province of china) in 2011 (Liu, Li, Jin, Wang, & Kun, 2013) found a positive relation between higher level of education and diseases awareness. In their data, they found only 37.70 percent people had comprehensive knowledge about HIV, 34.25 percent about TB and 36.12 percent for HBV. The authors found the education level as basic determinant of awareness about diseases [12].

For gauging the awareness regarding hepatitis B virus in Vietnamese Americans' and to compare the knowledge and practices of men and women, (Victoria M. Taylor, et al., 2005) conducted a community-based, in-person survey of Vietnamese men and women in 2002. Majority of the respondent were well aware that HBV can be transmitted during sexual intercourse, by sharing razors and tooth brushes etc. HBV is prevalent in Punjab (Pakistan) at an alarming rate. As the objective of our study is also to assess the level of knowledge about the disease, by analyzing the public awareness foer the HBV risk factors, we may be able to determine the ways to prevent its rise and formulate health policies accordingly [13].

A study conducted by Mahbubur Rehman and M. Salim Uz-Zaman (2005) in Bangladesh to evaluate the awareness of HIV/AIDS and risky sexual behavior found that male drug users had the highest level of awareness about AIDS. According to the study this high level of awareness could be attributed to higher level of education and higher socio-economic class of the respondents. These were also found to be the most crucial determinants of awareness regarding the warning signs for cancer in Britain. Although this study of N. Brunswick et al. (2000) examines the status of knowledge regarding cancer, which is not covered by our study but at the same time their results give us valuable insights into the various determinants of awareness. Interestingly, the report not just found strong association between income, higher education and the resultant level of awareness but it elucidated that females tend to have more knowledge about the disease. A study conducted by Mei, X. et al, (2020) in Wuhan, China found that the respondents lived in rural areas, had lower education levels and lower household income were possessed relatively lower level of health literacy

[13]. Similarly, a study conducted in Pakistan and Afghanistan by Gregory J. Joseph, (2018) proved the significant association between literacy rate and HIV-related knowledge [14]. Respondents with no education were less likely to have knowledge about HIV transmission. All the above discussion showed that studies investigating health literacy have important practical value. This gives an important aspect to look at if public health knowledge is sufficiently enough to develop healthy society or it need some improvements. There remained little published evidence on the association of transmission of communicable diseases in public in Pakistan. By trying to look at such determinants through our study we would be able to identify the role, the policy makers and people can play in disease prevention.

DATA AND METHODOLOGY

The Pakistan Demographic and Health Survey (PDHS) is cross-sectional survey which is conducted by the Pakistan Bureau of Statistics (BOS) with the technical assistance from Opinion Research Corporation (ORC) Macro. PDHS is nationally representative survey and one of the richest sources of information available to examine the determinants of the healthcare in Pakistan. This study has utilized the microdata of PDHS, 2018. The sample design of PDHS provides estimates of all rural and urban areas of Pakistan, four provinces including Punjab, Sindh, Baluchistan and Khyber Pakhtunkhwa and four regions including Islamabad Capital Territory, FATA, Azad Jammu and Kashmir, and Gilgit Baltistan. This analysis is only specific to four provinces and excluded the above mentioned four regions. A total of 13,118 ever married women and 3,634 men were found eligible for interview in sample of PDHS which were reduce to 8,642women and 2,658 men when excluding the four regions in data cleaning process. Awareness and knowledge of causative factors and complications of diseases has been assessed using both qualitative and quantitative methods. Descriptive data has presented as frequencies and percentages. In economics, logistic regression is an example of a qualitative response/discrete choice model. It covers the binary as well as the categorical response variable where the output can take only two values of 0 and 1. The numbers represent the outcome of interest like pass/fail, win/lose, alive/dead, healthy/sick or yes=1, no=0. In current study, the dependent variable is binary with two categories yes and no: if the respondent has knowledge about transmission of disease then it is represented by yes=1 and if not then it is represented by no=0. When dependent variable is binary then the suitable technique for the estimation is Logistic regression. Logistic regression analysis studies the association between a binary dependent variable and a set of independent (explanatory) variables.

Let

Pi is the probability of awareness about transmission of diseases, the model can be written as

The above model is a simple model with one independent variable. Here Pi is the probability of awareness about transmission of disease. If we consider xi is education of respondent. When xi =1 (uneducated) β1 shows the log of odds of awareness about diseases in educated respondents. We can write the model in terms of odds as:

Or in terms of the probability of outcome (e.g. awareness about transmission of disease) occurring as:

Conversely, the probability of the outcome not occurring (e.g. awareness about transmission of disease) is

Notice that we have so far not included a residual term in the models, and have instead expressed the model in terms of population probabilities. But we could write it as:

It may be kept in mind that it is not normally distributed, and furthermore, it is assumed that it was a linear regression.

Variables and Models

In questionnaire, the respondents were asked the question "have you ever heard about illness called tuberculosis or TB?" if the "yes" response was received then they were asked the second question to gauge their knowledge about TB transmission from one person to another "How does tuberculosis spread from one person to another?" For this, they were given the following options:

A.   through the air when coughing or sneezing
B.   Through sharing utensils
C.   By touching a person with tb
D.   Through sharing food
E.   Through sexual contact
F.   Through mosquito bite

The respondents who responded option "A" were considered with correct information while the others were misunderstanding in knowledge about TB. So, a new binary variable was generated by re-coding the question 2. Those who gave the correct information about transmission of TB were given the option "yes" and 'no' to other options. Awareness about TB is taken as dependent variable while the independent variables are provinces, education, wealth status, age, area of residence, exposure to television and internet etc.

The same practice was used to access the correct knowledge of respondents about hepatitis B or C. the respondents were asked the question "have you ever heard of illness called hepatitis B or C". The respondents who responded "yes" were further asked "is there anything a person can do to avoid getting Hepatitis B or C". The "yes" response were asked further question "what can a person do to avoid getting hepatitis B or C" by given them different option such as safe blood transfer, practice safe sex and use of disposable syringe were some among them. The reuse of syringes in healthcare has been consistently identified as major route of hepatitis B and C transmission in Pakistan and other developing countries (Baig, Awan, & Khan, 2019) (Janjua, Butt, & Mahm, 2016) (Sood A,et al., 2018). Similarly, unsafe blood transfer is also one of the reasons to spread the hepatitis B&C in Pakistan. So, we have used this information as correct knowledge about transmission of hepatitis. This awareness about Hepatitis is taken as dependent variables while the independent variables are provinces, education, wealth status, age, area of residence, exposure to television and internet etc [16].

In PDHS questionnaire for men and women, the respondents were asked the question "have you ever heard about HIV or AIDS?" if the "yes" response was received then they were asked about HIV/AIDS transmission from one person to another while given the options of having just one uninfected sex partner, mosquito bites, sharing food, witch craft or other supernatural means etc. Among these, most common ways to be infected

with HIV is through unprotected sex. So, we have recoded the information by generating a new binary variable, the respondents who responded option "unprotected sex" were considered with correct information while the others were misunderstanding in knowledge about HIV and coded as "no". This awareness about HIV/AIDS is taken as dependent variables whiles the independent variables are provinces, education, wealth status, age, area of residence, exposure to television and internet etc.

The models of the study for both men and women are of following:

RESULTS

Socio-demographic Characteristics of Participants

The socio-demographic data of the study are four provinces of Pakistan: the population of Pakistan is 201 million; the population density of it was 5.43%. Average monthly household income is PKR 41, 545 (HIES, 2018). Survey respondents, were 8,642 females and 2,658 were males. Age of participants was ranges between 15 to 49 in both men and women. Age distribution: 35-39 had the largest proportion (24.51%) in females and 30-34 is the largest proportion in males. Educational level: the largest proportion of females was uneducated while in males the largest proportion of respondents were secondary level educated. The income distribution showed that largest proportion of women in sample was belonged to poorest group in females and poorer group in males (Table 1).According to PDHS, 2018, the most commonly assessed form of media is television in Pakistan. The frequency of watching television on weekly bases is relatively higher in male group as compare to females. There is lowest use of internet in females with 7.40 percent only while the use of internet in males was 32.17 percent.

Table 1: Socio-Economic Demographic Characteristics of Respondents

Characteristics	Male		Female	
	N	%	N	%
Age				
15-19	36	1.35	289	3.34
20-24	228	8.58	1749	20.2
25-29	502	18.89	2770	32.1
30-34	535	20.13	2088	24.2
35-39	522	19.64	1259	14.6
40-44	411	15.46	363	4.2
45-49	424	15.95	124	1.43
Education				
None	723	27.2	4666	54
Primary	470	17.68	1237	14.3
Secondary	865	32.54	1681	19.5
Higher	600	22.57	1058	12.2
Income				
Poorest	497	18.7	2009	23.3
Poorer	548	20.62	1745	20.2
Middle	500	18.81	1695	19.6
Richer	569	21.41	1670	19.3
Richest	544	20.47	1523	17.6
Residence				
Rural	1377	51.81	4718	54.6
Urban	1281	48.19	3924	45.4
Province				
Punjab	853	32.09	6630	51.1
Sindh	778	29.27	2850	23.7
Balochistan	505	19	642	5.35
KPK	522	19.64	1901	15.8
Watching Television				
Yes	1949	73.35	4773	55.2
No	708	26.65	3869	44.8
Use of Internet				
Yes	855	32.17	600	7.4
No	1803	67.83	7509	92.6

Due to high incidence, TB is considered one of the most common diseases in Pakistan. The results showed that 51 percent of the people had the knowledge about transmission of TB. According to the results the public knowledge about the transmission of hepatitis B&C was not sufficient enough to prevent the people to getting it as 75 percent of the respondents did not considered that the disposable syringes are of greater risk of getting hepatitis B&C.

Predictors of Diseases Literacy

Inequalities can be observed in the awareness level of TB among different segment of socitiy due to lowest socio economic profile (Households Integrated Economic Survey, 2018), Baluchistan is taken as base category, the results indicated that people lived in punjab were more aware about TB than in Baluchistan , However the situation is different in case of Sindh and Khyber Pukhtunkhaw (KPK). Similarly, the educated the indivuals possessed more level of awrness in both male and female. The income was found one of the determinent of awareness of TB which indicates that the higher the level of income, the higher the level of awareness for that particular disease. Use of mass media (internet and watching TV) were also associated with high level of knowledge in both genders. People living in urban area were used as base category to assess the knowlwge about TB, the results indicated that both the men and women living in rural areaa are 0.26 and 0.14 time less likely to have knowledge about diaseas respectively.

Second model is performed for assessing the determinants of awareness of Hepaptitis, the people liviling in Punjab are less aware about the use of disposable syringes to avoid geeting hepatitus B and C than that of people in Baluchistan. Education and level of income of the people living in urban areas and use of mass media are signifcant determinants of the awareness about hepatitis in case of both men and women. While the place of residence is not significantly associated with knowledge of hepatitis in women. The income level is used here as a proxy for the standard of living which founds that the awareness is signifciantly affecetd with the level of income.

According to the results, it can be seen that the odd ratio of awareness about HIV/AIDS in women living in Punjab is 2.73 indicated that they are 2.73 time more likely to aware about HIV/AIDS than the women living in Baluchistan which is taken as base category. But the men are 0.21 time less likely to aware about HIV/AIDS in Punjab. According to UNAIDS data 2018, among all adults living with HIV/AIDS in Pakistan, about 31 percent are women while 69 percent are men and the studies conducted by (Rehan et al, 2016) (Sing et al, 2017) also reflected the same results that women are more aware about HIV/AIDS than that of men. Both the men and women having secondary or higher level education are also more aware as compare to those with no education. Similarly, the women belonging to the richest wealth quintile and having exposure to mass media had high overall knowledge towards AIDS. The base category of indicator "Age" is people lived in urban areas [17,18]. The odd ratio 1.12 indicated that men living in rural areas are more likely to have comprehensive knowledge about HIV/AIDS than that of living in urban areas but the same is not true for women. By summarsing the discussion, we can see that area of residence, higher level of education and exposure to mass meida are associated with high level of knowlwedge about diseases in women

[19,20,21]. It implies that more educated the individuals; more will be the level of awareness. The income level is not significant determinant of awareness in the women. In case of men, education, income and area of residence is highly associated with knowledge about HIV/AIDS.

DISCUSSION

In Pakistan, the high burden of above discussed diseases with 12 million people suffering from hepatitis B or C, about 165,000 people living with HIV in 2019, and 5th highest burden of TB disease among world ranking, the associated factors/predictors have been analyzed. The findings showed significant variations among different socio-economic groups. The knowledge of transmission of TB was found to be higher among people in Punjab. The odds were 1.12 and 1.14 in men and women respectively. Similarly, the people living in urban areas are were more informed than rural area. This rural disadvantage was also confirms in previous studies [22,23,24]. This could also be attributed to the low patronage of education in the rural areas than the urban areas. According to micro data of PDHS 2018, it is estimated that among all uneducated people, about 65 percent belonged to rural areas. The education not only makes the people aware to protect themselves from getting infection but also encouraging people to be concerned with their own healthcare for a successful future. The indicator of TB Awareness and Hepatitis Awareness was found significant at all level of education in both men and women. Television and internet usage are very effective media tools to reach the general population in order to communicate relevant information through music, news items, dramas, and advertisements. Significant associations have been found between media exposure and comprehensive knowledge about TB and Hepatitis in both men and women. This study found out that persons watching television, at least, once a week had odds ratio of 1.28 in men and 1.12 in women possessed that those who watched TV had knowledge about transmission of TB and Hepatitis diseases than those who did not watch television. Similarly, respondents that used internet possessed high level of knowledge about all the diseases than those who did not use internet. These results are similar to studies conduct in Ethiopia [25,26], the authors found that the female participants who had no access to mass media were 1.52 times less likely to possessed TB knowledge as compared to those who had access media at least once a week. In case of knowledge about transmission of HIV/AIDS in respondents, the mass media exposure did not reflect good picture because in Pakistan, it is not regular practice to deliver HIV-related messages through television. The reasons cited for limited promotion of preventive knowledge included the social and cultural inhibitions as well as the reluctance of the policy makers (National AIDS Control Programme, National Institute of Health, Minnistry of Health, Government of Pakistan, 2009).

RECOMMENDATIONS

The literacy about aforementioned communicable diseases was found to be adversely associated with respondents' low education level, people living in rural areas, low income quintile and low exposure to mass media etc. Thus on the biases of these evidences, it is suggested that health promotion interventions and health literacy should be targeted to people who are illiterate, belongs to lower income groups and lived in rural areas to

improve health outcomes. Following are some of the suggested policy intervention:

- Role of electronic media (TV) is important and internet exposure is also important to spread the knowledge on transmission of communicable diseases. So, the authorities may consider and strengthen their media strategy to generate information especially among younger population, social networks such as Twitter and Facebook are useful Medias to spread knowledge about diseases. Similarly, video sites such as YouTube have also made connections with the younger generation, the ones who are most at risk. Furthermore, the information may be provided via programs of public's own interest such as dramas, documentaries, theaters, soap opera format which emulates the "Bollywood" style are the best option chosen to reach across to the population. National Days may also be designed for each of the above-mentioned diseases to raise awareness. Clinicians should also be encouraged to take this opportunity to let their patients know about the risk of infections, explain the benefits of preventive measures such as regular testing for disease and checkups in case of any danger symptoms etc.

- Education is very important determinant of comprehensive knowledge of diseases, Effective Information, Education and Communication (IEC) materials are an important component of the comprehensive disease education programme which can be used to reinforce what people already know, and to contribute to changing attitudes and behaviors. It is known that most effective IEC materials capture interests of the local population and can therefore be vital in educating people about the diseases. In addition, such effective materials are easy to understand, communicate disease specific messages, and can easily be remembered. So, the dissemination of IEC material is also an important tool of information. Such type of preventive knowledge of high prevalence diseases must be a part of curriculum at different levels of education.

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