IDENTIFICATION OF BASIC HEALTH INFORMATION AND KNOWLEDGE AT HIGH SCHOOLS IN SWAT RURAL AREAS (A WAY TOWARD VEBH MODEL IMPLEMENTATION)

Habib Ur Rahman
Nazir Ahmed Sangi
Moiz Uddin Ahmed
Department of Computer Science (DCS), Allama Iqbal Open University (AIOU), Islamabad
e-mail: habibswt@gmail.com

ABSTRACT

Common diseases mostly occur due to lack of basic health information and knowledge to public at large. Therefore, basic health information and knowledge is very much important to reduce the outbreaks of different diseases especially in rural communities which is possible through proper education. Education is a natural and an inborn part of any community or society. High quality and healthy volunteers can be generated in a society by right education with full support of any kind of facility.The objective of this paper is to gather and identify information and knowledge about basic health from students and teachers. In this paper, first we study current basic health (information & knowledge) situation of teachers and students in high schools of District Swat (70% mountain rural areas and 30% urban areas), Khyber Pakhtunkhwa Pakistan. Secondly, find out the willingness of high school teachers and students for basic health information and knowledge using information communication technology (ICT) i.e. through a proposed "Virtual Education for Basic Health (VEBH)" model at high school level. For this purpose a pilot research survey was conducted in seven tehsils of district Swat which contained 119 high schools, including 77 male high schools and 42 female high schools.The respondents are willing to learn basic health information and knowledge through virtual and commented that it will be better for rural mountainous areas of Swat especially for female health. VEBH model will make the students aware about common diseases and ensure future healthy society.

Keywords: information communication technology, health information & knowledge, basic diseases

Education is a natural and an inborn part of a community or society. High quality and healthy volunteers can be generated in a society by right education with full support of any kind of facility. Knowledge and information are powerful motivational for effectiveness of any society improvement, due to knowledge any country can gain power on financial and social improvement (Cholin, 2005). The Phadke (2003) stated that lake of basic health in individuals of a society is involved directly or indirectly due to different ecological and social issues. Similarly he stated that improved basic health is also the basic right of every person of a community or society to enjoy a successful and healthy life. Health is the basic element of success in any society. Therefore, better health is performing a solution part in individual, domestic and community development (Phadke, 2003). For Swat to become a healthy district of the country, it is very important to adapt and encourage basic health

knowledge and information in schools. Therefore, using ICT is a dire need for schools to fulfill the basic health knowledge and information.

The Government of Khyber Pakhtunkhwa established Information Communication Telecommunication Labs through ICT Project in elementary and secondary schools and also hired ICT teachers. Our previous research study (Sangi, & Rahman, 2017) concluded that students and teachers have a great interest using ICT for education. However, there are some questions about how to improve awareness in society about basic health? Can virtual education improve the basic health information and knowledge in our traditional education? The answer is yes, i.e. our research proposed model, i.e. VEBH (Virtual Education for Basic Health). VEBH is technological based proposed model which provides basic health information and knowledge to high schools' students using ICT. Presently, there is no basic health information and knowledge for schools virtually. VEBH will be educate the students for basic health and different common diseases. Basic health information and knowledge is especially important for high schools' students, because they are the future members of community and society.

LITERATURE REVIEW

In recent era, the e-learning methods somehow integrated in traditional education to solve the teaching and learning difficulties. E-learning is an economical method and platform of learning. It is the using internet, computer and many other electronic devices for education (Li, 2010). ICT environment is very influential in education because students and teachers are interested in self dynamic, practical, helpful and bound for learning knowledge and information process using electronic technologies (Volman, & Van Eck, 2001). A large number of knowledge and learning materials data and information in every type of subject matter is exist and available in the form of multimedia at any time and from any place because of Internet and World Wide Web (Sarkar, 2012). The Soltani, and Aliyev (2011) expressed, tested and believed that ICT based environment is reachable from any place, anytime and any electronic appliance which will increase literacy rate, quality of education and individuals' knowledge and information in any sector of education. Similarly, Moodle (2018) is learning management system which is designed, protected, dynamic and incorporated for administrators, teachers and students. The International Conference on Health Promotion at Ottawa, Canada in collaboration with World Health Organization (WHO) at 1986 and then Kickbusch, and Nutbeam (1998), which is called Ottawa Charter and similarly Smith, Tang, and Nutbeam (2006) documented and defined role and importance of promoting and learning of basic health education in schools which steadily increasing healthy life in any society of the world, therefore WHO insisted that people should know about their basic health condition and their control over many diseases which are occurring due to lack of basic health knowledge and information. Whitman, Aldinger, Levinger, Birdthistle, and Jones (2000) and similarly Racette, Cade, and Beckmann (2010) have studied many research works and find that there is a big difference between knowing and unknowing people of basic health information and knowledge. The researchers further stated that learners of basic health knowledge and information effect are vast because they know about their health conditions and know, how to overcome many diseases? Therefore they keep and make themselves healthy.

Government of Pakistan recognized high importance of health education in schools, therefore, initiated Health Promoting education plan in Schools with alliance of United Nation Educational, Scientific and cultural Organization (UNESCO). Similarly National Commission for Human Development (NCHD) also started School Health agenda in 17 different districts of Pakistan

for determining health condition of schools' students (Prasla, & Prasla, 2011) but there is no implementation of basic health knowledge and information in high schools, only these memorandums of health promotion in schools still exist in documents and books. These all health events and health promoting education are carried out in schools as sporadic activities, but not still on regular basis learning of basic health knowledge and information in schools. According to Pakistan Bureau of Statistics (2018), district Swat population contained 70% rural areas and 30% urban areas. Majority of residents are living in rural areas, the number of female high schools are less than male high schools, as shown in Table 1.

Table 1. Statistics of District Swat Population

Tehsil	Rural Areas				Urban Areas				Grand Total			
	No. of House Holds	Population	Male	Female	No. of House Holds	Population	Male	Female	No. of House Holds	Population	Male	Female
Babuzai	32,714	267,949	144,692	123,257	41,301	331,091	178,789	152,302	74,015	599,040	323,482	275,558
Matta	47,595	423,349	228,608	194,741	5,030	42,647	23,029	19,618	52,625	465,996	251,638	214,358
Kabal	34,055	302,271	163,226	139,045	13,888	118,103	63,776	54,327	47,943	420,374	227,002	193,372
Khwazakhela	26,540	217,544	117,474	100,070	5,425	48,027	25,935	22,092	31,965	265,571	143,408	122,163
Bahrain/Kalam	22,121	186,687	100,811	85,876	7,854	61,787	33,365	28,422	29,975	248,474	134,176	114,298
Barikot	10,833	89,755	48,468	41,287	11,949	94,245	50,892	43,353	22,782	184,000	99,360	84,640
Charbagh	15,315	126,115	68,102	58,013	-	-	-	-	15,315	126,115	68,102	58,013
Grand Total	**189,173**	**1,613,670**	**871,382**	**742,288**	**85,447**	**695,900**	**375,786**	**320,114**	**274,620**	**2,309,570**	**1,247,168**	**1,062,402**
Percentage	**69%**	**70%**	**38%**	**32%**	**31%**	**30%**	**16%**	**14%**	**100%**	**100%**	**54%**	**46%**

Note.This statistics table data of district Swat population retrieved from Pakistan Bureau of Statistics, 2017.

After earth quack in 2005, militant insurgency in 2009, devastating flood in 2010, dengue fever disease outbreak in 2013 and many other natural disasters, Swat has a lot of basic health, education and economical issues in rural areas especially females are facing a lot of problems.

Basic health was described in first international conference on health promotion at Otawa, 21st November 1986 by WHO in the form of health promotion i.e. to facilitate the individuals whoever society people or schools' students on knowledge and information of basic health diseases and prevention measures which become further for better health society (WHO, 1986). WHO at year 2008 has published a policy brief and stated that health information and knowledge is needed for society improvement because it equalizes health and reduces possibilities of hospitalization (Coulter, Parsons, & Askham, 2008; WHO, 2008). The researchers planned and executed e-Healthcare Management System in Kagawa University, Japan which provides professional health education through university' students collected and analyzed medical records (Imai, Hori, Kamano, Mori, Miyazaki, & Takai, 2011 June). WHO and United Nation Children's Fund (UNICEF) initiated "Health for all" and electronic devices like Internet, mobile phones and other wearable devices are best practice for basic health information and knowledge source (Mondal, & Mukherjee, 2017). Rehman, Khan, and Abbas (2007) stated in their research work that government of Pakistan has started a joint program plan with the WHO, UNICEF, World Bank and other international donor agencies named

"Health for All". The objectives of this program is that the government would make sure provision of different precautionary, health-giving and revitalized facilities to individuals, communities or societies (Khan, & et. al., 2007), but these all programs and events related with health knowledge and information are still in stand by and are not doing at regular intervals in high schools. We have collected three years (2015, 2016 & 2017) diseases data of district Swat from District Health Office. After the analysis of these data, we found that six diseases (respiratory infection, diarrhea, typhoid fever, suspected hepatitis/jaundice, suspected malaria and skin diseases) are top common communicable diseases. In three years (2015, 2016 & 2017) average of diseases data trend are shown in Figure 1.

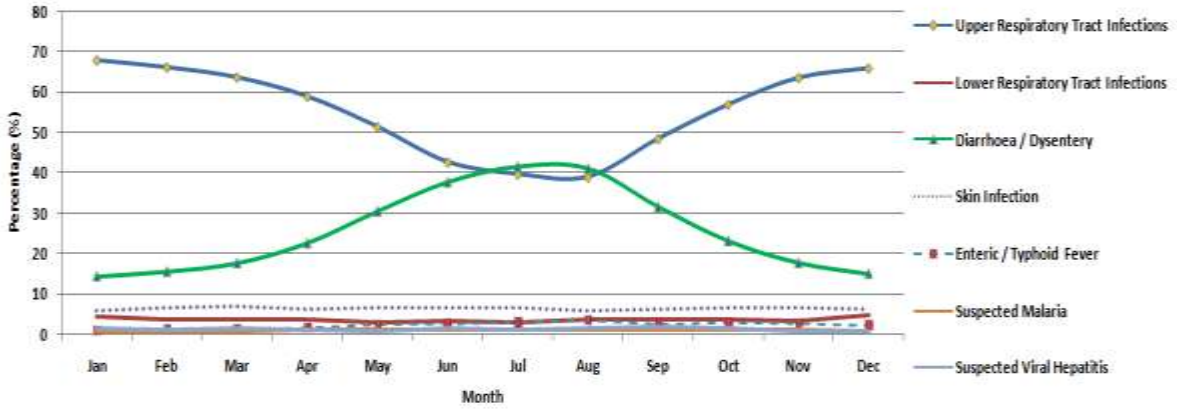

Figure 1. Communicable diseases data trend of 3 years (2015, 2016 & 2017) average

The Figure 1 shows that highest fluctuation of respiratory infection disease occurred during September, October, November, December, January, February, March and April months. Similarly, diarrhea disease increased during April, May, June, July, August and September months. The remaining diseases occurred almost the same in throughout the year. The highest average is 1374984 out of total 2327776 (59%) of respiratory infection (upper respiratory and lower respiratory) disease followed by diarrhea 601487 (26%), skin disease 146659 (6%), typhoid fever 54420 (2%), suspected hepatitis/jaundice 31761 (1%) and suspected malaria 24409 (1%). If we see gender wise disease data trend, then the female percentage (average of 3 years) is showing higher than male which is 1377557 (59%) and 950219 (41%) respectively (see Figure 2).

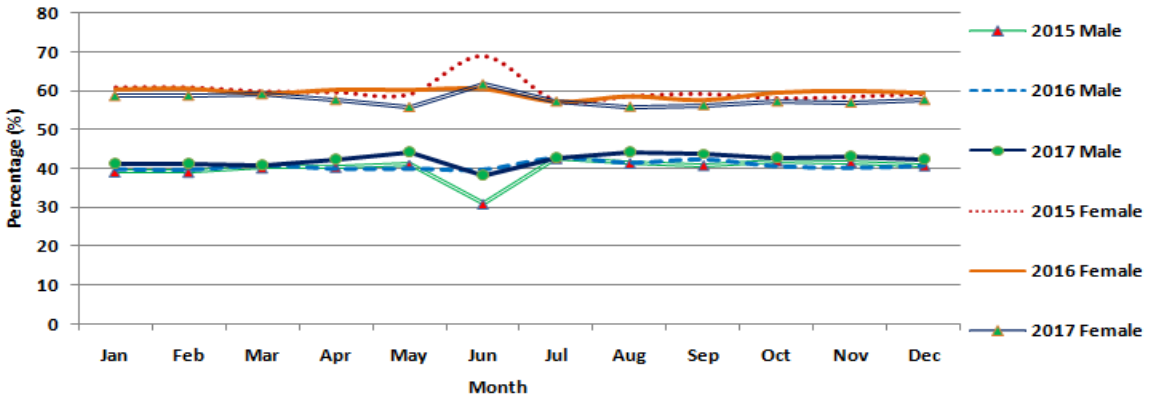

Figure 2. Gender wise diseases data trend of 3 years (2015, 2016 & 2017)

RESEARCH OBJECTIVES

The objectives of this paper are given below. These are derived from propped research VEBH model objectives.

a. To find out common health issues in society.
b. To determine the basic health knowledge and different common diseases information from high school students.
c. To find gaps of basic health information and knowledge at high schools.
d. To find willingness to learn basic health information and knowledge in formal education.
e. To find inclination towards implementation of previous proposed VEBH model at high schools.

SAMPLING AND RESPONDENTS' PROFILE

The scope of this research survey is restricted to Government High Schools, District Swat. A sample was acquired from government male and female high schools which located in both rural and urban areas of Swat. The sample size for this research was kept 400 because ideal sample size is 384 for Confidence level 95%, confidence interval (margin of error) 5% and population of Swat Government High Schools is 48,620. The sample size is determined in two steps; in first step, calculated the sample size for infinite populations and in second step; the sample size adjusted to required schools' population (adjust sample size) (Cochran, 1977). The survey was conducted randomly in 75/119 (63%) high schools including 50/77 (65%) male and 25/42 (60%) female high schools. The response rate of schools was 80% (n=60) high schools including 56% (n=42) male and 24% (n=18) female high schools. The questionnaire consist of five simple sections, first section related with respondents profile, second section consist of questions about computer and internet usages and existence in schools, third section consist of basic health information and knowledge introduction type questions, fourth section about respondents' illness and last fifth section consist of five like-kart type questions. A total of 400 questionnaires were distributed in selected high schools. The survey respondents were 319 respondents (24% teachers i.e. 76 respondents and 76% students i.e. 243 respondents) as shown in Figure 3. The respondents' gender ratio was 71% (227 respondents) males and 29% (92 respondents) females as shown in Figure 4.

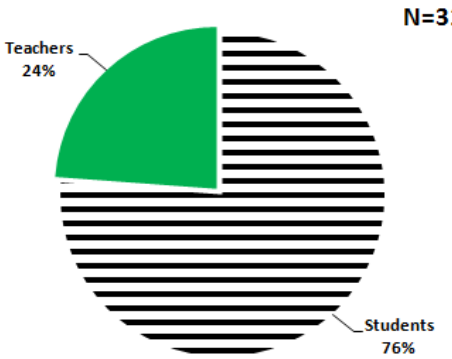

Figure 3. Teachers and students proportion

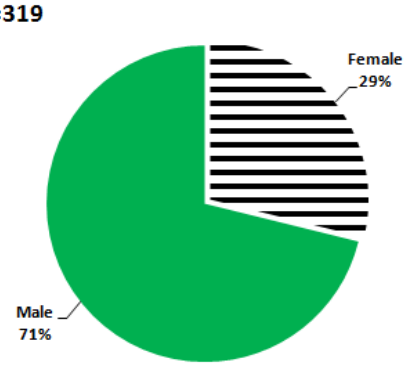

Figure 4. Gender wise proportion

The respondent students' age was 14–17 years and respondent teachers' age was 24–45 years. Almost all high schools have computer labs, provided and facilitated by Khyber Pakhtunkhwa through IT project.

METHODOLOGY

The research study was conducted between March and June 2018 in District Swat including both urban and rural areas. We used quantitative and descriptive statistics' method for research survey. For the primary data collection, we randomly selected government high schools including females' schools. We distributed 400 questionnaires in the form of hard copies among randomly selected fifty (50) government male high schools and twenty five (25) government female high schools. Secondly, we used MS Excel 2007 for data collection and analysis. The response rate was 80% (319 respondents out of 400) including 71% (n=227) male and 29% (n=92) female. The respondents were from 7th, 8th, 9th and 10th classes. The questionnaire was about basic health and common diseases which frequently occur in society. We selected six communicable diseases, i.e. respiratory infection, diarrhea, typhoid fever, suspected hepatitis/jaundice, suspected malaria and skin diseases for research survey, because these diseases are common among the communities as analyzed on the basis of three years health data collected from District Health Office (DHO) Swat. For secondary data i.e. high schools data, we collected the same from District Education Offices (Male and Female) Swat. Then we generated thematic GIS map (as shown in figure 6) using ArcGIS 10.4 to easily determine their locations in urban as well rural areas. Figure 5 shows complete detail work flow of research methodology.

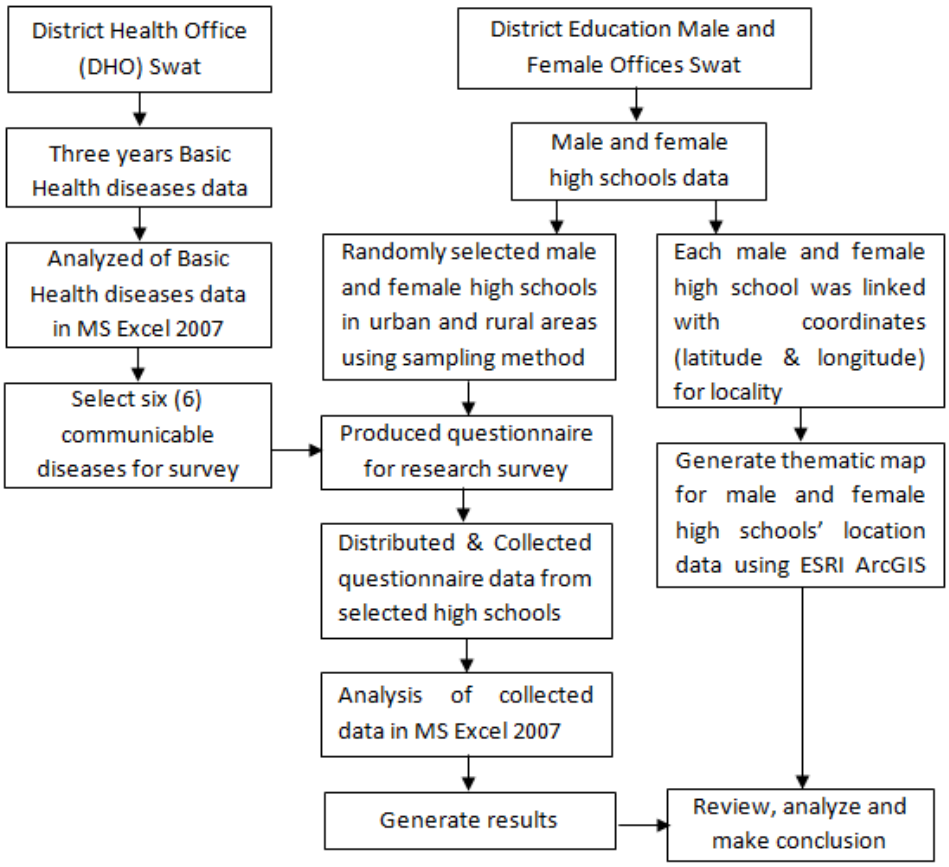

Figure 5. Detail workflow of research methodology

RESULT

Figure 6 shows location map of male and female schools at district Swat. According to the District Education Officer Swat, a total of 119 high schools including 77 (65%) male high schools and 42 (35%) female high schools exist in the district of Swat (Swat Education Department, 2018).

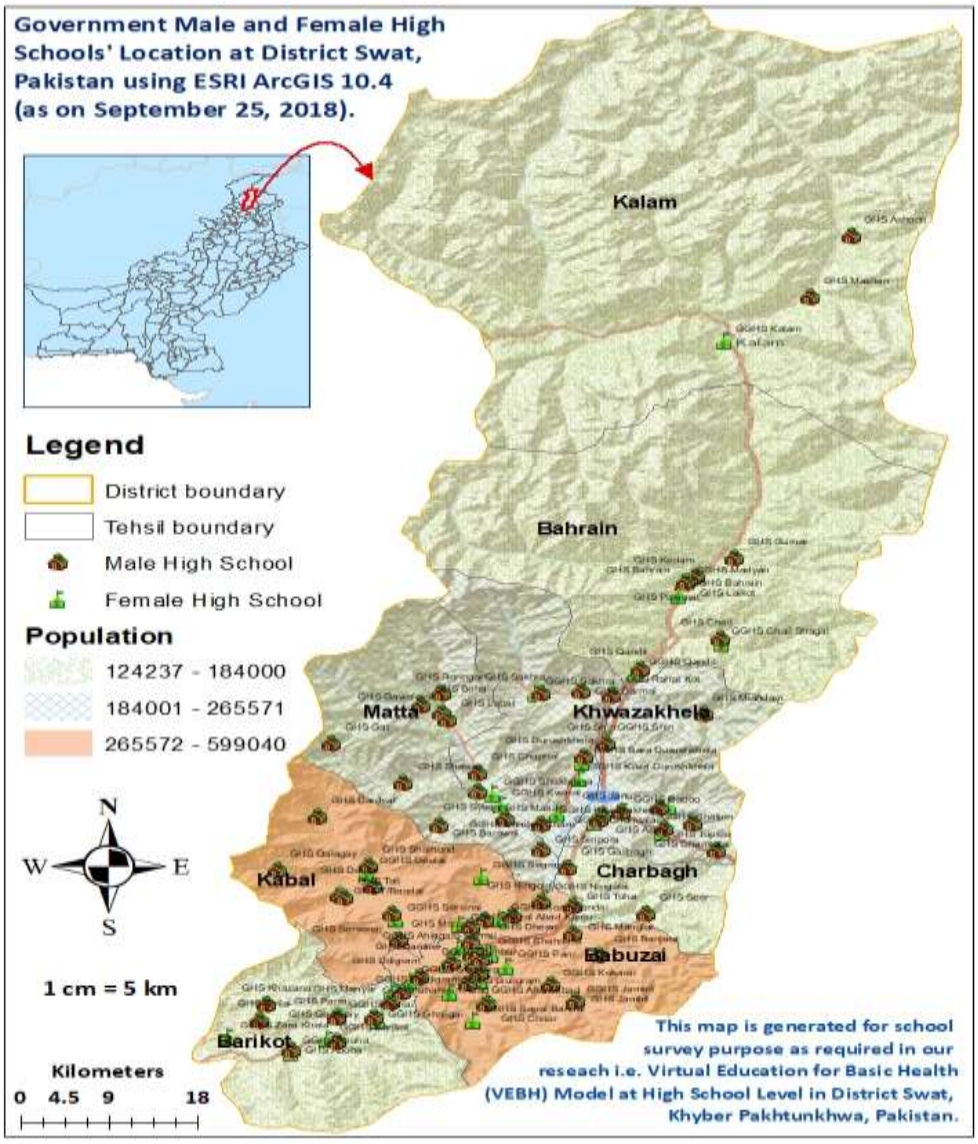

Figure 6. Male and Female schools' location map at district Swat (as on September 2018)

The research study was carried out in 75 numbers of schools (50 males & 25 females) at different locations in district Swat. Respondents' rate was 80% (319 out of 400) including 243(76%) students (comprised of 172 (71%) males & 71 (29%) females and 76 (24%) teachers comprised of 55 (72%) males & 21 (28%) females.

Usage of computers or laptops

It is very important to know about the uses of computer during survey among students and teachers. Figure 7 shows ratio of respondents' computer usage, from their point of view. The majority 257 (81%) respondents have been using computer since 1 to 5 years followed by 40 (13%) respondents, who used computer for 6–10 years, 14 (4%) respondents who never used computer and 8 (2%) respondents used computer for 11–15 years.

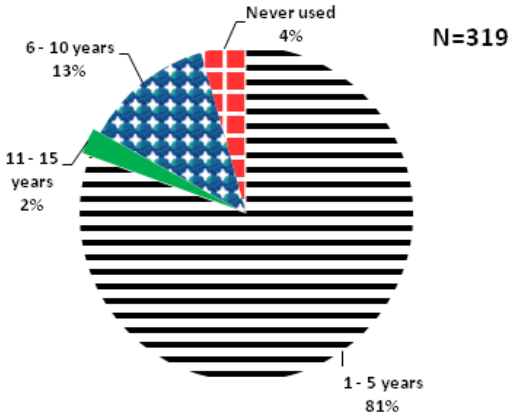

Figure 7. Usage of Computer/Laptop status in years

Respondents when they have been patient

In this research survey, some related and valid questions were also asked about basic health, common disease information, reasons of diseases from respondents (see Figure 8). A highest number of 270 (85%) respondents had been patients of diarrhea. Similarly, 245 (77%) respondents had been the patients of hepatitis/jaundice, followed by 223 (70%) suspected malaria, 195 (61%) typhoid fever, 185 (58%) respiratory infection and 181 (57%) skin infection. The highest number of 125 (39%) respondents who had not been patients of skin infection, followed by 118 (37%) respiratory infection, 117 (37%) typhoid fever, 74 (23%) suspected malaria, 61 (19%) hepatitis/jaundice and 30 (9%) diarrhea. Similarly respondents which were responded "don't know" are 22 (7%) suspected malaria, 19 (6%) diarrhea, 16 (5%) respiratory infection, 13 (4%) hepatitis/jaundice, 13 (4%) skin infection and 7 (2%) typhoid fever.

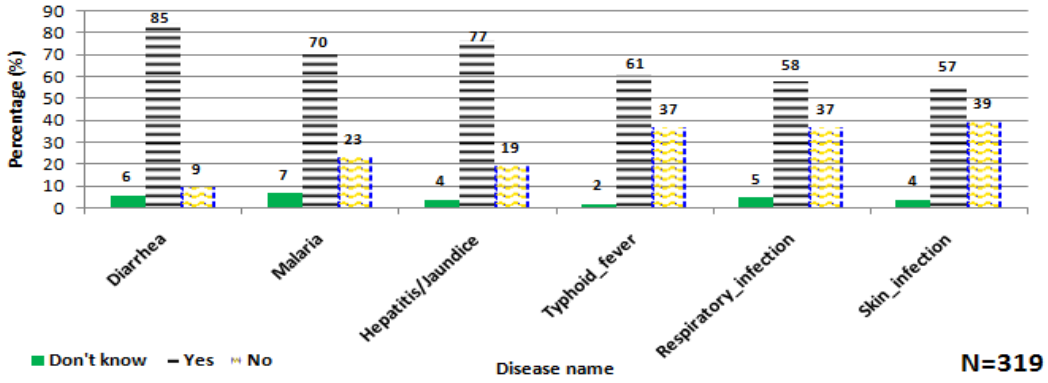

Figure 8. Respondents have been patients

Reasons of diseases with respective respondents

From Figure 9, we can easily understand that many of the respondents were not aware of the reasons of the diseases i.e. how these come and spread in community or society. The respondents are showing the highest percentage in diarrhea 261 (82%) including males 184 (58%) and females 77 (24%), respiratory infection 255 (80%) including males 181 (57%) and females 74 (23%), suspected

malaria 248 (52%) including males 174 (55%) and females 74 (23%), hepatitis/jaundice 248 (78%) including males 174 (55%) and females 74 (23%), skin infection 243 (76%) including males 162 (51%) and females 81 (25%) and typhoid fever 239 (75%) including males 169 (53%) and females 70 (22%). Similarly, the highest ratio is showing intyphoid fever 55 (17%) including males 37 (12%) and females 18 (6%) which responded "No" followed by skin infection 50 (16%) including males 29 (9%) and females 21 (7%), suspected malaria 49 (15%) including males 36 (11%) and females 13 (4%), hepatitis/jaundice 49 (15%) including males 36 (11%) and females 13 (4%), respiratory infection 44 (14%) including males 32 (10%) and females 12 (4%) and diarrhea 37 (12%) including males 28 (9%) and females 9 (3%). Finally, the highest ratio of respondents was in skin diseases was reported as 26 (8%) including males 18 (9%) and females 8 (3%) for "Yes" followed by typhoid fever 25 (8%) including males 21 (7%) and females 4 (1%), suspected malaria 22 (7%) including males 17 (5%) and females 5 (2%), hepatitis/jaundice 22 (7%) including males 17 (5%) and females 5 (2%), diarrhea 21 (7%) including males 15 (5%) and females 6 (2%) and respiratory infection 20 (6%) including males 14 (4%) and females 6 (2%).

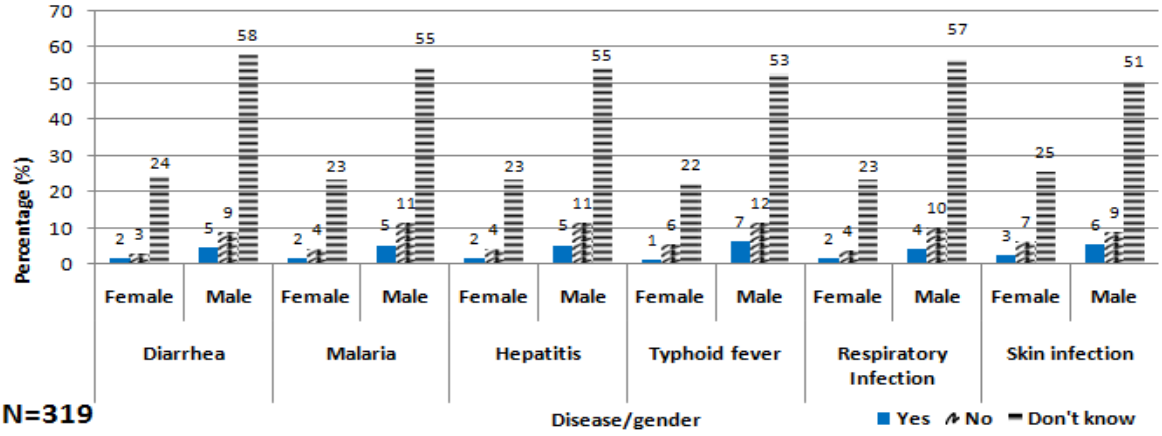

Figure 9. Respondents know reasons of diseases

Willingness toward virtual education for basic health

Figure 10 shows that majority of respondents are in favor of basic health information and knowledge. Therefore, the following points are noted for detail discussion…

a. The respondents' ratio, who agreed for BHIK by using educational technology was 48% (n=154), strongly agreed 9% (n=30), neutral 33% (n=104), disagreed 10% (n=30) and 0% strongly disagreed for BHIK using educational technology.
b. Similarly, the respondents who agreed for BHIK by using computer and Internet was 69% (n=219), strongly agreed 21% (n=66), neutral 6% (n=18), disagreed 4% (n=16) and strongly disagreed 0%.
c. The respondents who agreed by using only Internet for BHIK, the ratio was 58% (n=186), strongly agreed 6% (n=20), neutral 31% (n=99), disagreed 4% (n=14) and strongly disagreed 0%.
d. Respondents showed interest in agree 62% (n=197), strongly agree 9% (n=28), neutral 18% (n=59) and disagree 11% (n=35) for basic health learning using only computer.

e. Respondents showed agree 74% (n=236), neutral 19% (n=60) and disagree 7% (n=23) for BHIK in traditional education.
f. At last, respondents responded agree 60% (n=190), strongly agree 19% (n=60), neutral 8% (n=27), disagree 13% (n=42) and no one responded strongly disagree for Basic Health Education at High School level.

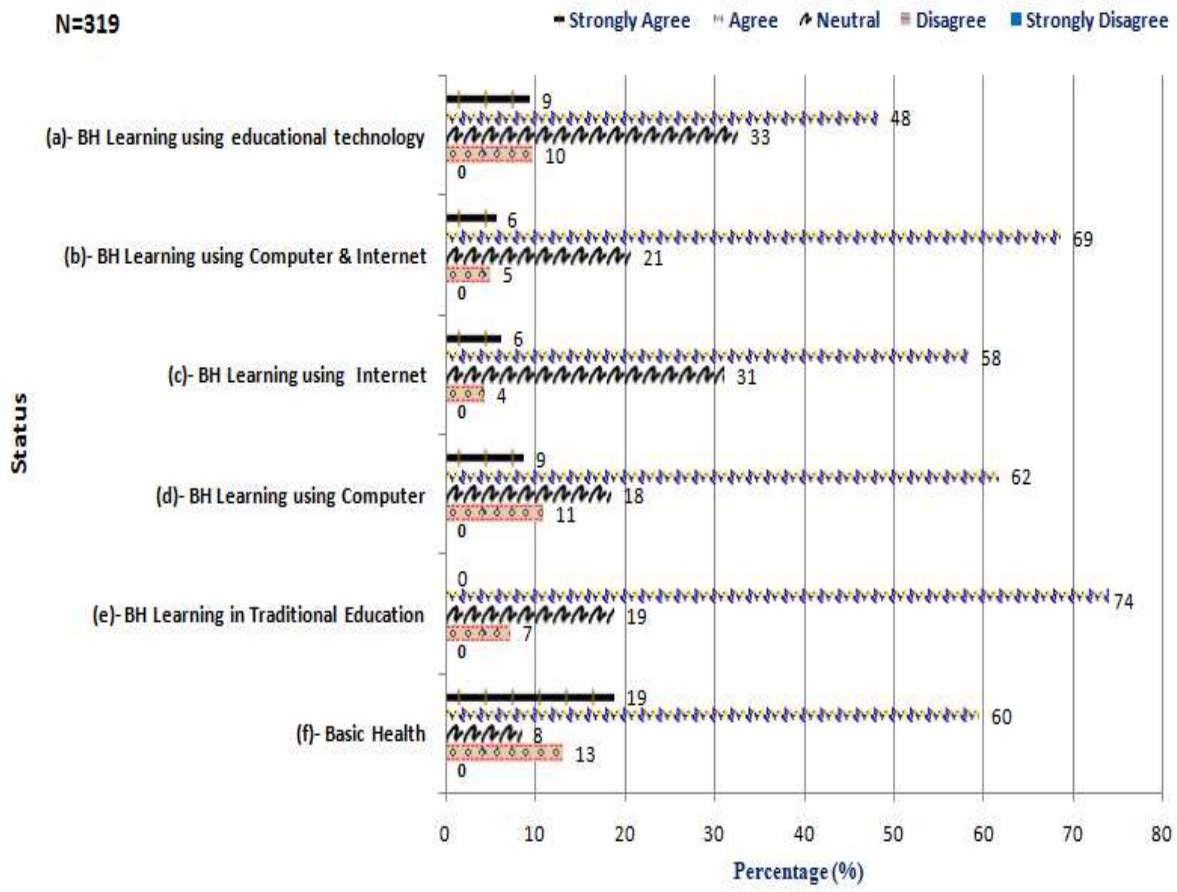

Figure 10. Willingness of respondents' response according to basic health

DISCUSSION

If the high schools' students obtain the necessary knowledge and information about basic health and disease control, a healthy society will take place. VEBH model is only one way to improve our society by students. After research survey data analysis, we concluded that majority of respondents were interested toward Basic Health Information and Knowledge (BHIK) has using ICT in their schools. Therefore, respondents' response has shown that BHIK at high schools level will make a healthy society. In this research survey, the ratio has shown 79% agree (agree 60% and strongly agree 19%) respondents for BHIK at high schools level. Respondents also showed 74% agree for BHIK in formal/traditional education. Similarly respondents who are interested using computer and internet for BHE showed 69%.

CONCLUSION

To build healthy societies, school teachers and students must learn information and knowledge about basic health. After all results and discussion, the following key points were concluded. Swat rural areas are mostly consisted of mountains. The residents there are not aware of basic health information and knowledge; especially females face many health problems. Swat rural areas are far away from Basic Health Centers and have large and difficult distances (mountainous) between societies and health centers. There is no basic health information and knowledge course, or activity exists in high schools' level in Swat, Khyber Pakhtunkhwa, Pakistan. Students want to learn basic health information and knowledge in their schools. It will be better to start virtual education for basic health information and knowledge in traditional education system. It will create healthy students especially female students who will lead to make a healthy society.

ACKNOWLEDGMENT

We would like to thank District Health Officer Swat, Dr. Bilal Bahrawar (Public Health Officer, Khyber Pakhtunkhwa), District Education Officers (male & female) and Dr. Alam Zeb Khan (Educationist, Swat) for their wonderful support and very important suggestion according to health and education related data and discussion of basic health education research.

REFERENCES

Cholin, V. S. (2005). Study of the application of information technology for effective access to resources in Indian university libraries. *The International Information & Library Review*, 37(3), 189-197.

Cochran, W.G. (1977). Sampling techniques (3rd ed.). New York: John Willy & Sons.

Coulter, A., Parsons, S., Askham, J., & World Health Organization. (2008). Where are the patients in decision-making about their own care? (No. EUR/07/5065810). Copenhagen: WHO Regional Office for Europe.

Imai, Y., Hori, Y., Kamano, H., Mori, T., Miyazaki, E., & Takai, T. (2011, June). A Trial Design of e-Healthcare Management Scheme with IC-Based Student ID Card, Automatic Health Examination System and Campus Information Network. In International Conference on Digital Information and Communication Technology and Its Applications (pp. 728-740). Springer, Berlin, Heidelberg.

Khan, N., & Abbas, M. (2007). Availability and utilization of primary health care services in the rural areas of district Peshawar-A case study. Sarhad Journal of Agriculture (Pakistan).

Kickbusch, I., & Nutbeam, D. (1998). Health promotion glossary. Geneva: World Health Organization, 14.

Li, S. (2010, December). The Application of E-Learning to Mental Health Curriculum in the Middle School. In Genetic and Evolutionary Computing (ICGEC), 2010 Fourth International Conference on (pp. 550-553). IEEE.

Moodle. (2018, October 15). Web based Education. Retrievedfrom https://docs.moodle.org/32/en/About_Moodle#Proven_and_trusted_worldwide.

Mondal, S., & Mukherjee, N. (2017, January). A framework for ICT-based primary healthcare delivery for children. In Communication Systems and Networks (COMSNETS), 2017 9th International Conference on (pp. 525-529). IEEE.

Pakistan Bureau of Statistics. (2018, September 21). Swat Population. Retrieved from http://pbs.gov.pk.

Phadke A. (2003). Right to Health Care: Towards an Agenda, Economic and Political Weekly, 4308-4309.

Prasla, M., & Prasla, S. A. (2011). School health promotion–International perspectives and role of health care professionals. *Journal of Ayub Medical College Abbottabad*, 23(1), 150-153.

Racette, S. B., Cade, W. T., & Beckmann, L. R. (2010). School-based physical activity and fitness promotion. *Physical therapy*, 90(9), 1214-1218.

Sangi, N. A., & ur Rahman, H. (2017). Utilization of Electronic Learning System in Swat Rural Areas. *Sukkur IBA Journal of Computing and Mathematical Sciences*, 1(2), 109-115.

Sarkar, S. (2012). The role of information and communication technology (ICT) in higher education for the 21st century. *Science*, 1(1), 30-41.

Smith, B. J., Tang, K. C., & Nutbeam, D. (2006). WHO health promotion glossary: new terms. *Health promotion international*, 21(4), 340-345.

Soltani, M., & Aliyev, A. (2011, October). Virtual teaching at the education centers. In Application of Information and Communication Technologies (AICT), 2011 5th International Conference on (pp. 1-3). IEEE.

Swat Education Department. (2018, June 15). Male and female high schools. Retrieved from http://sed.edu.pk/education-literacy-department/.

Whitman, C. V., Aldinger, C., Levinger, B., Birdthistle, I., & Jones, J. (2000). EFA 2000 Assessment; Thematic Study on School Health and Nutrition. Report commissioned by the WHO.

Volman, M., & Van Eck, E. (2001). "Gender Equity and Information Technology in Education: The Second Decade". *Review of Educational Research*, 71(4), 613–634.

World Health Organization. (1986). Ottawa Charter for Health Promotion. Ottawa: Canada.