Effect of Health Educational Guideline for Barbers about Hepatitis B and C in Port Said City

Mona Abd-El Sabour Hassan[*], Magda Ali Mohamed, Ateya Megahed Ibrahim

Family and Community Health Nursing, Faculty of Nursing, Port Said University
*Corresponding author: monaessam2012017@gmail.com

Abstract   *Background*: Hepatitis B and hepatitis C have some common epidemiological characteristics, and have infected millions of people throughout the world. During haircut, shave, or pedicure, barbers may accidentally expose to their clients' blood, transmit their own infection to them, or transmit the infection from one client to another. *Aim*: to evaluate the effect of health educational guidelines for barbers about hepatitis B and C in Port Said City. *Design*: A quasi-experimental research design with pre-post-test was utilized for this study. *Sample size:* It was carried on 245 barbers; 187 males and 58 females. *Setting:* the study was conducted at all certified barbers shops (82 shops) located in Port Said city. *Tools*: Three tools were used to collect data, knowledge of barber about HCV and HBV questionnaire, observational checklist for barbers 'practice regarding HCV and HBV & barbers' attitude scale. *Results:* 78 % of the study group had poor total level of knowledge, 97.3% had unsatisfactory total practice as well as 95.2% had total negative attitude before conducting the educational guidelines. A highly statistically significant improvement was detected after implementation of the guidelines in their total level of good knowledge (80.7%), satisfactory practice (94.6%) and positive attitude (97.8%). There was a statistically significant positive correlation between the study group's total knowledge score and total practice score. *Conclusion:* More than three quarters of the study group had poor total knowledge, most of them had negative attitude as well as unsatisfactory total practice regarding HCV and HBV before application of the educational guidelines, a remarkable improvement in knowledge, practice and attitude after implementation of the health educational guidelines, had been detected with highly statistically significant differences between pre and post phases. Also the implementation of the educational guidelines had been the most predictor variable. *Recommendation*; More educational programs for improving knowledge, practices and healthy attitude of barbers should be integrated into their training programs, evaluation of the long-term effects of such education programs are also recommended. Replication of similar specific studies using large probability samples at different settings is highly recommended.

Keywords: Barbers, Educational Guidelines, Hepatitis B and C

1. Introduction

Hepatitis B and Hepatitis C are serious global public health problems with a prevalence of 10-15% with majority of the cases seen in the developing countries including Egypt. [1] Developing world is facing a burden of epidemics of blood borne diseases. These diseases increase the morbidity and mortality, ultimately resulting in heavy burden on national economics and individual level. Hepatitis B and Hepatitis C are serious global public health problems. Globally, each year around 2 billion people are infected with the hepatitis B virus (HBV), of which more than 350 million have chronic HBV infections. The prevalence of Hepatitis B & C infection worldwide in general population is around 10-15%, and majority of the cases are seen in rural population. An estimated, more than 180 million people worldwide are infected with hepatitis C

virus (HCV) and 3-4 million are newly infected each year. [2] Barbers are in continuous contact with scissors and blades, and are considered a high-risk group for these infections. [3]

Hepatitis B and C are the main causes of severe liver disease, including hepatocellular carcinoma, cirrhosis, and end stage liver disease. [4] The global burden of hepatitis B and C viral infections is widely present, around one third of the world's population has been exposed to the hepatitis B virus (HBV) infection, an estimated 350-400 million people are infected and one million people deaths of hepatitis-B-related diseases. [3]

Furthermore, the World Health Organization (WHO) estimates that hepatitis C virus (HCV) infects more than 185 million people worldwide, and estimates that mortality rate will continue to increase over the next 20 years. [5]

Barber is a person whose occupation is to cut hair, give shaves, and trim beard. Barbering is an old profession.

They were considered as medicine men that used to perform different procedures like circumcision, incision and drainage, tooth drawing. [6,7] With the latest advancement in surgery and dentistry, the role of barbers got restricted to hair cutting and shaving beards. [8]

There is a long list of the factors contributing to HBV and HCV spread including blood transfusion, mother to child transmission, contaminated syringes, unsafe sex, and reuse of razors by barbers. [9] Shave from barbers whether face or the armpits has also been identified as the major risk face tor for Hepatitis, as most of the times, the barbers are in the habit of reusing blades for shaving purposes. [10] Majority of the barbers do not have any perception of unhealthy and harmful working practices in barbering. [11]

Barbers and unqualified dental practitioners could be important in the spread and transmission of hepatitis B and C. Negligence during the use of sharp instruments may be a risk factor for blood borne infections causing serious health problems for both the barbers and clients**. [12,13]** Razor sharing and shaving in barber shops has been identified as a key risk factor for hepatitis B and C transmission reported that, there is strong evidence that razors, barber's scissors, nail files and body piercing instruments are risk factors for transmission of hepatitis B and C. [14]

According to Mutocheluh and Kwarteng, [15] awareness of barbers about HBV or HCV and job-related factors contributing to spread of infections was very poor among the vast majority of the barbers studied. They indicated that poor knowledge and lack of awareness of the barbers about HBV and HCV is the main cause of the rapid spread of these infections through the profession in developing countries.

Knowledge and specific information has an important role in HBV/HCV prevention and the barbers 'have a central responsibility in prevention, care and treatment. Therefore, it is important to improve knowledge, practice and attitudes towards barbers living with HBV/HCV disease among barbers. Gained information can be used to direct educational guidelines. [16]

One of the strategies that should be used to prevent the increased spread of HBV/HCV diseases-is guidelines aiming at expansion of knowledge develop practices and gaining positive attitude toward this issue. A number of studies from developing countries have examined knowledge; attitude related to HBV/HCV diseases infections [17] that indicate inadequate knowledge and awareness among barbers' related to HBV/HCV diseases infections. Lack of knowledge and awareness on these issues can further adversely affect the safe work practices of the barbers 'and make them vulnerable to HBV/HCV infections. Therefore, frequent on job an educational guidelines on HBV/HCV diseases can prove to be very beneficial in safety and promoting occupational health among the barbers.

Nurses and other primary health care professionals play an important role in providing pre-and post-test discussion as part of diagnostic testing for HCV and HBV. Community health nurse can affect public health through innovative educational programs. Provision of thorough test discussion in a primary health care setting utilizes a valuable educational opportunity to help minimize HCV and HBV transmission in the community. [18]

1.1. Significant of the Study

Egypt has the largest HBV/HCV prevalence in the world with (14.7%) of the population being antibody positive for HCV. HBV is 50 to 100 times more infectious than HIV. Barbers as risk group for acquiring HCV and HBV, should be provided with high awareness about HCV and HBV to avoid the risk of infectious agents transmission by reusing of razors and scissors on multiple clients. [1] HCV and HBV transmission through sharing of non-sterile sharp instruments such as those used for barbering have always been given less attention in the campaign against the spread of HCV and HBV. [19] Moreover, the study which was conducted by Abdelrahim [20] which entitled Sero-prevalence, Knowledge, Attitude and Practices among barbers and their customers regarding HCV and HBV in Assiut District, Egypt, concluded that Majority of barbers and their customers (88.6% and 80.6% respectively) had poor knowledge regarding HCV and HBV.

Considering the grave consequences of infections especially Hepatitis B and C associated with this profession; improve awareness about these health hazards among barbers would play a vital part in prevention and control of these infections. [21] Therefore, this study was sought to implement and evaluate the effect of the educational guidelines on barbers' knowledge, practices and attitude regarding HCV and HBV.

1.2. Aim of this Study

The aim of this study was to evaluate the effect of the health educational guidelines C for barbers about hepatitis B and C in Port Said City; through

1. Assess barbers' knowledge, practice and attitude regarding HCV and HBV.
2. Develop health educational guidelines for barbers about HCV and HBV.
3. Implement health educational guidelines for barbers about HCV and HBV.
4. Determine the effect of the health educational guidelines on barbers' Knowledge, practice and attitude**.**

1.3. Research Hypothesis

There will be an improvement of the barbers' knowledge, practice and attitude after implementation of the educational guidelines about hepatitis B and C.

2. Subjects and Method

2.1. Design

A Quasi-experimental (pre-post-test) design was utilized for this study.

2.2. Setting

Port Said city is divided into five districts, namely; Elmanagh, Elshark, Elzohour, Elaraband, Eldawahy; the study was conducted in all certified barbers shops

(82 shops) located in all five districts of Port Said city,the shops were divided as follow, (El-managh (14 shops), El-shark (12 shops), El-zohour (27shops), El-arab (18 shops) and El-Dawahy (11 shops).

2.3. Study Population

The actual population of the study was the barbers working in certified barbers shops in Port Said City.

2.4. Sample

The study included all barbers in Port Said city who accepted to participate in the study. They are 245 barbers & hairdressers; 187 males and 58 females'. They were chosen with the following inclusion criteria; (**a**) All barbers who were permanently working in the pre-mentioned settings; (**b**) working at least 6 months before conducting the study; (**c**) agree to participate in the study.

Tools of data collection: Three tools were used in data collection

Tool (I): Knowledge about hepatitis B & C questionnaire:

This tool was adopted by **Shalaby**. [9] It was used to assess knowledge level about hepatitis B and C diseases among the study group .It divided into two parts;

Part (1): *Personal characteristic & source of information of the barbers& hair dressers:* it included data related to the study group's characteristics such as: age, educational level, marital status, residence, working experience as barbers, source of information about hepatitis B and C, as friends, media, health workers, … etc.

Part (2): *Knowledge of barbers about HCV and HBV* this part used to assess knowledge of the study group regarding Hepatitis C (HCV) & Hepatitis B (HBV). It included 21 questions about definition of the disease, causative agents, modes of transmission & complications.

Scoring System:

The study group's answers were compared with a model key answer, where (1) score was given to correct answer, and (0) for incorrect answer. These scores had converted into a percentage score. The study group's knowledge was evaluated good if the percent score was $\geq$ 70%, while considered satisfactory if the percent score was 50-70 % and poor if the percent score is less than 50%.

Reliability:

Internal consistency reliability of the scale was demonstrated by coefficient alpha of 0.83.

Validity:

Content validity was established through a .97 percentage agreement among experts in the field that the items measured the domain in question.

Tool (II): *Observational checklist for barbers' practice andrisky behaviors:* An observational checklist adopted by **Shalaby** [9] *and* **Abdelrahim** [22] was used to record the observed practices of barbers of risky behaviors during shaving and hair-cutting, it includes 19 items, such as, wash razor with antiseptic solution, change the towels between each customer, change the blade for each client, washes hands between each customer, etc.

Scoring System

Measuring the scores of the barbers practices & hairdresser during shaving & hair-cutting practices, as follows: the practice done correctly scored one point (1); not done practice & incorrect scored zero (0). These scores are converted into mean, standard deviation and percent score. The study group's practice is considered satisfactory, if practice score $\geq$ 60% & unsatisfactory if practice score <60%.

Reliability:

Cronbach alpha's for internal constancy for these scales (n=18) ranged from 0.69 to 0.85.

Validity:

Content validity was established through a .95 percentage agreement among experts in the field that the items measured the domain in question.

Tool (III) Barbers' Attitude scale: Attitude scale adopted by Khairkhah [23] to assess barbers & hairdresser attitude toward hepatitis B & C. The scale was translated from English to Arabic language by a panel of experts, It includes 11 items, such as, I avoid any contact with hepatitis B/C patients, I keep my job even if, I am a disease carrier, I need to protect myself at work., etc.

Scoring of Barbers' Attitude

The total number of items is (11) items and they are measured on three points Likert scale ranging from 1, 2 and 3 for responses: disagree undecided and agree, Score of items is summed up with total score divided by number of items giving mean score for the attitude. The barbers attitude is considered positive, if attitude score $\geq$70%& negative if attitude score <70%.

Validity: Content validity was established through a .91 percentage agreement among experts in the field that the items measured the domain in question.

Reliability: The created and approved apparatus for the information was tried for reliability quality on an example of 10% test retest result utilizing, alpha Chronbach uncovered that all things are altogether contrasted and has a connection coefficient over the limit of critical (r =.74).

Pilot Study:

A pilot study was carried out on 10 % of the participants (N=25) representing the study sample to test the feasibility and clarity of the used tools. The sample included in the pilot study was excluded from the final study sample.

Ethical Consideration:

An informed consent was obtained from certified barbers & hairdressers to participate in the study after explaining the purpose and the importance of the study. The study group was informed that their participation is voluntary and they have the right to withdraw from study at any time. Ensuring the confidentiality of the information collected and anonymity is guaranteed.

Field work:

Data collection, preparation, implementation & evaluation of guideline were took about 8-month from 15th April 2018 to the 15th of November 2018 (4 days per week)**.** The study undergo through four phases (preparation, planning. implementation, and evaluation phase), as follow:

I. Preparation phase: Immediately agreement was approved to conduct this study, the investigators were beginning to collect data assembly. They met participants who match the conditions. The goal of this study was explained to them after taking their oral consent. The researchers met the barbers in their shops to collect pretest using the pre-mentioned tools. Personal data & Knowledge about hepatitis B & C was assessed using **tool I**, barbers practices of risky behaviors during shaving and

hair-cutting was assessed using **tool II**, followed by **tool III** to assess their attitude. The time range from 20 to 35 min. for each one.

II. Planning phase: the researcher used the assessment data and recent related literature in developing the educational guidelines about hepatitis B & C. Based on the study objectives: **1**) the knowledge part covered the general information concerning the hepatitis B & C diseases (routes, and methods of transmission, treatment, and complications of hepatitis B & C). **2**) Attitude part covered the general trends toward hepatitis B & C. **3**) Practice part was developed based on practices related to precaution & prevention of hepatitis B & C as (wearing gloves, use gloves while working and hand wash after removing gloves, disinfectant used and changing of the disinfectant liquid frequently etc …).

III. Implementation phase: The health guidelines were carried out at the faculty of nursing, Port Said University during barbers', day off (usually Monday). The study group was divided into 16 groups; each group contained 15-16 barbers & hairdressers. The guidelines were conducted through six sessions; each group obtained the six sessions through 2 weeks (3 sessions a week), each session took about 30 minutes. The total allocated time for achieving guidelines objectives for the sixteen groups was 48 hours (16 groups × 3 hours). At the beginning of the first session, an orientation to the aim of the study and the goals of the guidelines took place. Also, barbers were oriented about the phases of the study and the sessions (time, duration, place, and contents). At the end of the sessions was offered a copy of guidelines for each barber in study group to use as reference in the future. Barbers were allowed to ask any interpretation, elaboration or explanation of any item included in the sessions.

IV. Evaluation phase: each group in the study was evaluated immediately after implementation of guidelines using the pre-mentioned tools.

2.5. Statistical Analysis

Data were fed to the computer and analyzed using IBM SPSS software package version 23.0. (Armonk, NY: IBM Corp) Qualitative data were described using number and percent. Quantitative data were described using range (minimum and maximum), mean, and standard deviation. Significance of the obtained results was judged at the 5% level. The used tests were, Pearson coefficient: to correlate between two normally distributed quantitative variables, Regression: to detect the most independent/affecting factor for practices in preventing Hepatitis B and C transmission.

3. Results

The study group comprised 245 of barbers, 41.2% aged <25 years, 31.0 % in the age group 25-35 years, the mean age was 29.34 ± 9.08, 76.3% of them were males, 23.7 were females, 38.8% of them had preparatory education, only 8.2% had secondary or technical education, 7.3% were just read and write, 50.2% were married, 26.95% were single, and 83.7% of them residence in urban, 40.8% of the studied sample had 5-10 years of working experience as a barber, 29.8% had 10 < 15 years of

working experience, the mean was 10.75 ± 5.75, 74.3% mentioned that the source of information about hepatitis B & C from television, 59.2 % mentioned from friends & relatives (see Table 1).

Table 1. Distribution of the study group according to socio-demographic data &sources of information (n = 245)

Socio-demographic data	No.	%
Age (years)		
<25	101	41.2
25 – 35	76	31.0
35-45	49	20.0
≥45	19	7.8
Min. – Max.	17.0 – 56.0	
Mean ± SD.	29.34 ± 9.08	
Sex		
Male	187	76.3
Female	58	23.7
Educational level		
Cannot read and write	18	7.3
Read and write	52	21.2
Primary education	60	24.5
Preparatory education	95	38.8
Secondary/technical education	20	8.2
Marital status		
Single	66	26.9
Married	123	50.2
Divorced	28	11.4
Widow	28	11.4
Residence		
Urban	205	83.7
Rural	40	16.3
Working experience as a barber		
<5	19	7.8
5 – 10	100	40.8
10 – 15	73	29.8
≥15	53	21.6
Min. – Max.	3.0 – 29.0	
Mean ± SD.	10.75 ± 5.75	
Source of information		
Friends & relatives	145	59.2
Television	182	74.3
Newspapers	68	27.8
Doctors	127	51.8
Radio	144	58.8
Health care workers	117	47.8
Television	182	74.3

Table 2: demonstrated that 75.9% of the study group had correct knowledge in the item, which told that HCV and HBV could be transmitted through sexual contact during the pre-test phase. While 97.1% had correct knowledge regarding the item, which confirmed that HCV and HBV effects on liver in the post test phase. Moreover, there was a remarkable improvement in the study group's knowledge after giving them a tutorial compared before giving the educational guidelines. Also, there were highly statistically significant differences in all items between pre, and post, knowledge of the study group.

Table 2. Distribution of the study group according total knowledge scores regarding hepatitis B and C (pre and post-test) (n = 245)

Correct knowledge	Pre-Guidelines implementation		Post-Guidelines implementation		X^2	P
	No.	%	No.	%		
Meaning of viral hepatitis B & C	96	39.2	221	90.2	76.08	0.001**
Ever heard about viral hepatitis B & C	99	40.6	232	94.7	89.08	0.001**
Mode of transmission:						
Blood transfusion	75	30.6	230	93.9	113.1	<0.001*
Reusing needles	81	33.1	232	94.7	109.6	<0.001*
Dental procedures	94	38.4	234	95.5	94.98	<0.001*
IV drug use	39	15.9	212	86.5	132.9	<0.001*
Scissors/surgical instruments	22	9.0	195	79.6	134.6	<0.001*
Barbers shaving instruments	8	3.3	203	82.9	169.2	<0.001*
Ear/body piercing	83	33.9	8	3.3	40.03	<0.001*
Sexual contact	186	75.9	228	93.1	15.25	<0.001*
Tattooing	28	11.4	6	2.4	7.3	<0.001*
Sharing utensils	138	56.3	223	91.1	41.55	<0.001*
Food	119	48.6	221	90.2	53.7	<0.001*
Water	108	44.1	222	91.6	66.87	<0.001*
Complications/treatment of viral hepatitis						
On liver	77	31.4	238	97.1	65.83	<0.001*
On general health	10	4. 1	109	44.5	30.46	<0.001*
Presence of HBV treatment	7	2.9	182	74.3	75.37	<0.001*
Presence of vaccine for HBV	18	7.3	175	71.4	60.64	<0.001*
Presence of HCV treatment	52	21.2	220	89.8	66.70	<0.001*
Presence of vaccine for HCV	14	5.7	154	62.9	50.72	<0.001*

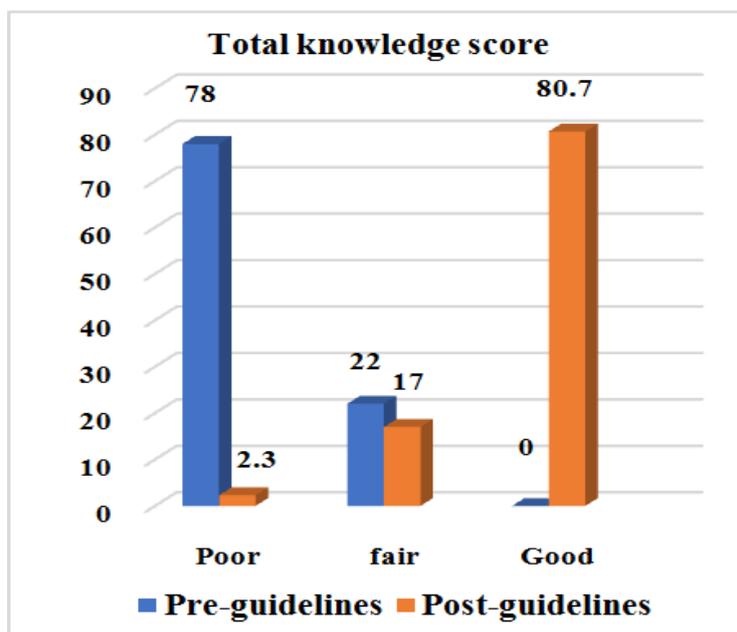(*) Statistically significant at p<0.05.

Figure 1. Distribution of the study group according to total Knowledge scores bout hepatitis B and C virus (pre- post) (N = 245)

Figure 1: showed that 78% of the study group had poor total knowledge in the pre-test phase, while 80.7% had good total knowledge score in the post-test phase.

Table 3: elaborated that 92.7% of the study group wears protective clothes/or gloves before giving the educational guidelines and all (100%) of the study group use povidone/iodine as a disinfectant and throws used blades in waste bin after implementation of the educational guidelines. Also, there was statistical significant improvement of the study group practices after implementing of the educational guidelines. Furthermore,

there were highly statistically significant differences between pre, and post, practice of the study group.

Figure 2: revealed that 97.3 % of the study group had unsatisfactory practice during pre-guidelines while 94.6% of them had satisfactory practice during post-test phase.

Table 4: depicted that 89 % of the study group were in disagreement with the point, which informed that community is at risk for hepatitis B/C prior implementation of the educational guidelines. In the post-test phase, 96.3% were in agreement with the item,

which revealed that the possibility of hepatitis B/C in people who use needles, razors, blades, or knives is higher than in others. Furthermore, there was statistical significant improvement of the study group attitude after implementing of the educational guidelines. Also, there were highly statistically significant differences between pre, and post, attitude of the study group.

Figure 3: showed that 95.2 % of the study group had negative attitude during pre-guidelines while 97.8 % of them had positive attitude after giving the educational guidelines.

Table 5: demonstrated that there was a statistically significant positive correlation between the study group's total knowledge score and total practice score. While there was no statistically significant correlation between total attitude and total knowledge scores & total practice score and total attitude score at p<0.001.

Table 6: showed multiple linear regression model for percent change (pre/post) knowledge scores, practices score & attitude score of the study group. As obvious in the table, the implementation of the health guidelines was the most predictor variable where p <0.00.

Table 3. Distribution of the study group according to practices regarding hepatitis B and C (pre and post-test) (n = 245)

Adequate Practices	Pre-Guidelines implementation		Post-Guidelines implementation		X^2	P
	No.	%	No.	%		
Changes the blade for each client	58	23.7	240	97.9	58.8	<0.001*
Disinfects the instruments	34	13.9	200	81.6	20.8	<0.001*
washes the used instruments	90	36.7	234	95.5	31.47	<0.001*
Washes hands between each customer	69	28.2	239	96.3	30.95	<0.001*
Wears protective clothes/or gloves	18	92.7	219	89.4	60.85	<0.001*
Disinfectant used						
Perfume	63	25.7	190	77.6	57.11	<0.001*
Alcohol	34	13.9	240	97.9	39.24	<0.001*
Povidone/iodine	0	0.0	245	100	0.00	<0.001*
Dettol	40	16.3	215	87.8	59.237	<0.001*
Alum crystals (Shaba)	66	26.9	201	82	42.810	<0.001*
Changes the towels between each customer	129	52.2	232	94.7	60.85	<0.001*
Uses razor machine	58	23.7	243	99.2	22.21	<0.001*
Throws used blades in waste bin	167	68.2	245	100	3.23	<0.001*
Properly disinfects skin cuts	169	69.0	241	98.4	32.13	<0.001*
Washes razor with antiseptic	19	7.8	236	96.3	45.2	<0.001*
Disinfect the razor before use for each client	12	4.9	239	97.6	55.4	<0.001*
Uses alum as antiseptic for skin cuts	115	46.9	189	77.1	69.4	<0.001*
Uses new razor for each client	18	7.3	237	96.7	36.23	<0.001*
Puts used blades in the box	163	66.5	213	86.9	19.5	<0.001*
Washes razor with tap water	127	51.8	220	89.8	32.4	<0.001*
Changing of the disinfectant liquid frequently	53	21.6	198	80.8	40.4	<0.001*
Sweeps the shop floor after every customer	40	16.3	225	91.8	28.9	<0.001*

N.B: * "Answers were not mutually exclusive".(*) Statistically significant at p<0.05.
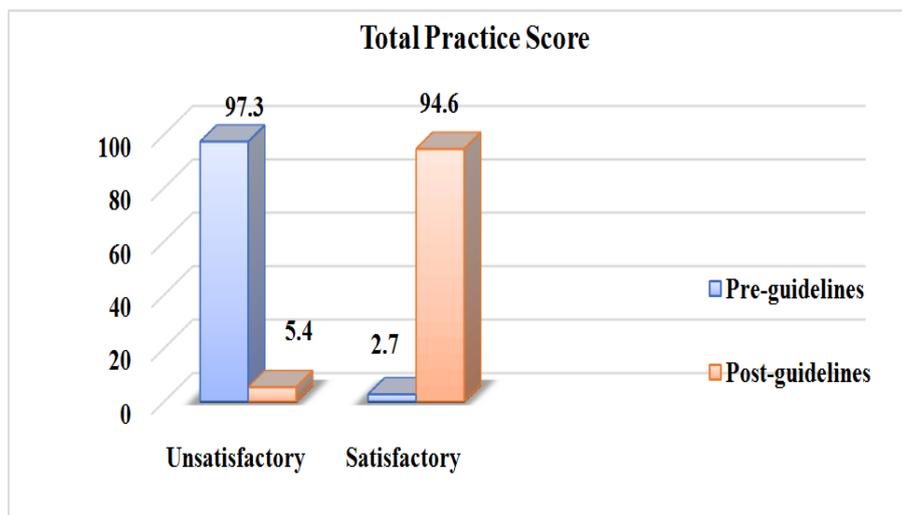

Figure 2. Distribution of the study group according to total practices scores regarding hepatitis B and C (pre and post-test) (n = 245)

Table 4. Distribution of the study group according to attitude regarding hepatitis B and C (pre and post-test) (n = 245)

Items	Pre-test (n= 245)		Post-test (n= 245)		χ^2	p
	No.	%	No.	%		
Community is at risk for hepatitis B/C						
Disagree	218	89	3	1.2	162.371*	<0.001*
Undecided	5	2	39	15.9		
Agree	22	9	203	82.9		
Possibility of hepatitis B/C in people who use needles, razors, blades, or knives is higher than in others						
Disagree	217	88.6	0	0.0	170.943*	<0.001*
Undecided	14	5.7	9	3.7		
Agree	14	5.7	236	96.3		
I avoid any contact with hepatitis B/C patients.						
Disagree	193	78.8	2	0.8	172.805*	<0.001*
Undecided	23	9.4	68	27.8		
Agree	29	11.8	175	71.4		
I have been exposed to hepatitis B/C risk						
Disagree	200	81.6	0	0.0	158.006*	<0.001*
Undecided	17	7	23	9.4		
Agree	28	11.4	222	90.6		
I am effective at preventing hepatitis B/C						
Disagree	199	81.2	3	1.2	137.324*	<0.001*
Undecided	19	7.8	22	9		
Agree	27	11	220	89.8		
Hepatitis B/C could be transferred to me through infected people						
Disagree	161	65.7	0	0.0	124.172*	<0.001*
Undecided	56	22.9	30	12.2		
Agree	28	11.4	215	87.8		
I would leave my job if I am a disease carrier						
Disagree	209	85.3	0	0.0	142.272*	<0.001*
Undecided	11	4.5	36	14.7		
Agree	25	10.2	209	85.3		
Exclusion of hepatitis B/C patients is a good method of prevention						
Disagree	211	86.1	7	2.8	130.536*	<0.001*
Undecided	28	11.4	43	17.6		
Agree	6	2.5	195	79.6		
I need to protect myself at work						
Disagree	141	57.6	73	29.8	41.886*	<0.001*
Undecided	0	0.0	0	0.0		
Agree	104	42.4	172	70.2		
I would keep my job even if I am disease carrier						
Disagree	168	68.6	12	4.9	85.011*	<0.001*
Undecided	32	13.1	34	13.9		
Agree	20	18.3	199	81.2		
Disposable blades are effective against hepatitis						
Disagree	114	46.5	14	5.7	61.881*	<0.001*
Undecided	93	38.0	70	28.6		
Agree	38	15.5	161	65.7		
Total mean score						
Min. – Max.	6.0 – 19.0		19.0 – 27.0		F= 340.883*	<0.001*
Mean ± SD.	13.57 ± 2.39		24.31 ± 1.59			

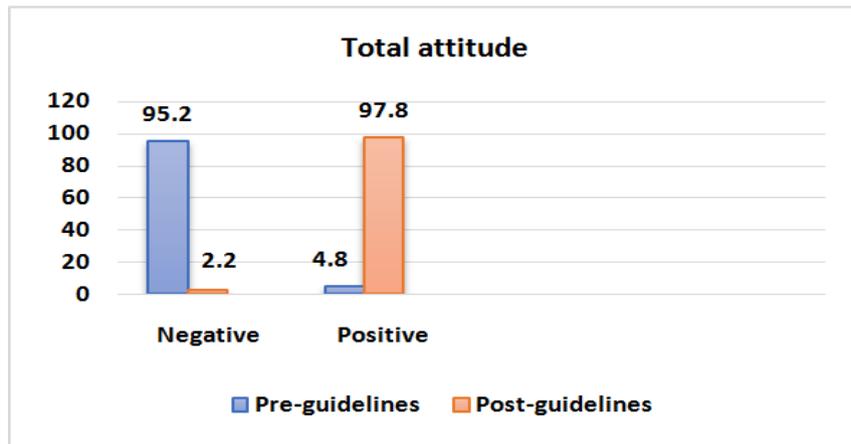χ^2: Chi square   *: significant at $p \leq 0.05$.

Figure 3. Distribution of the study group according to total attitude scores regarding hepatitis B and C (pre and post-test) (n = 245)

Table 5. Correlation between knowledge, practices and attitude scores of the study group regarding hepatitis B and C (pre and post-test) (n = 245)

Items	Pre-test		Post-test	
	r	p	r	p
Knowledge VS practice	0.270*	0.005*	0.355*	<0.001*
Knowledge VS attitude	-0.104	0.285	-0.100	0.304
Practice VS attitude	-0.068	0.483	0.012	0.905

r: Pearson coefficient (*) Statistically significant at p<0.05; (**) Statistically significant at p<0.01.

Table 6. Multiple linear regression model for percent change per/post knowledge, practices and attitude scores of the study group

	B	SE	t	p
knowledge scores				
Guidelines	1.609	0.095	16.858*	<0.001*
Age	0.081	0.250	0.326	0.745
Education	2.133	0.973	8.192	0.091
Years of experience	0.032	0.288	0.113	0.911
$R^2 = 0.737$, F = 72.282*, p <0.001*				
Attitude scores				
Guidelines	1.726	0.108	15.923	<0.001*
Age	0.169	0.133	1.269	0.207
Education	0.245	0.504	0.486	0.628
Years of experience	0.217	0.156	1.394	0.166
$R^2 = 0.736$, F = 71.891*, p <0.001*				
Practice scores				
Guidelines	1.869	0.183	10.215*	<0.001*
Age	0.042	0.343	0.122	0.903
Education	2.025	1.32	1.533	0.128
Years of experience	0.241	0.396	0.608	0.545
$R^2 = 0.509$, F = 26.722*, p <0.001*				

N.B (value of R2 range from 0-1).
R: coefficient of regression: Unstandardized Coefficients
Beta: Standardized Coefficients, t: t-test of significance
*: Statistically significant at $p \leq 0.05$

4. Discussion

Hepatitis C and B, viral infection is one of the most contagious diseases that have great social and economic impact which may touch the future of the young generation and hinder the community. Therefore, the importance of this study to improve barbers' knowledge, practices and attitude regarding HCV and HBV.

Negligence during the use of sharp instruments is a risk factor for several health hazards including communicable diseases and skin conditions, both for the barber and the clients. Some of the main diseases linked to this profession are; infestation of head louse, staphylococcal Scabies (through contaminated towels, combs, and aprons) and Hepatitis B, hepatitis C, and AIDS (contaminated blades and clips). Without realizing these issues a large proportion of population is enjoying the services of barbers in our community. [1]

Considering the grave consequences of infections like Hepatitis B, C and AIDS, associated with this profession; National and Provincial Health departments, public health authorities and professionals are creating awareness through nationwide campaigns and programs involving both print and electronic media. In spite of all these efforts a lot needs to be done in increasing awareness regarding different risk factors involved in the transmission of these diseases. [24,25]

The aim of the present study was to evaluate the effect of educational guidelines concerning hepatitis B and C diseases on barbers' knowledge, attitude and practices. Results of the present study showed that slightly more than two fifths of the study group aged less than 25 years old, slightly more than three quarters were male, slightly less than two fifths had preparatory education, half were married, the majority of them lived in urban, and two fifths had experience at shaving profession ranged from 5-10 years.

Concerning knowledge, attitude, and practice of the study group in relation to HCV and HBV before implementation of the educational guideline, the findings of the present study reflected that the majority of the study group had poor total knowledge; the most had unsatisfactory practices, as well as negative attitude. This may be due to the limited access of information, young age, low level of education, and there were no regular and periodic educational sessions about blood borne diseases and occupational hazards offered to them. In addition, the remarkable lack of clear policy, lack of experience, lack of investment and interest in safety issues and shortage of preventive strategies implemented by the Ministry of Health and Directorate of Health Affairs probably resulted in such significant decline in knowledge, practices and attitude of the study group before implementation of the guideline.

These findings were in agreement with *Aziz*, [26] in their study entitled" Knowledge, Attitude and Practices of Barbers about Hepatitis B & C Transmission in Islamabad, Pakistan", concluded that slightly less than two thirds of the barbers had poor total knowledge about different aspects of Hepatitis B & C (sterilization of instruments before using on next client, mode of transmission, sign and symptoms, treatment vaccination and which organ is effected most. Furthermore, Abdelrahim [21] who conducted a study entitled" Sero-prevalence, Knowledge, Attitude and Practices among Barbers and Their Customers Regarding HCV and HBV in Assiut District, Egypt", depicted that Majority of barbers and their customers (88.6% and 80.6% respectively) had poor knowledge regarding HCV and HBV.

In the same vein Abbasi, [27] in the study named" Prevalence of hepatitis B virus infection among barbers and their knowledge, attitude and practices in the district of Sukkur, Sindh", elaborated that the overall barbers' performance on the knowledge and practice scales was poor. Also, Jokhio, [25] in the study named Knowledge, attitudes and practices of barbers about hepatitis B and C transmission in Hyderabad, Pakistan, reported that barbers had poor knowledge, attitude and practices about hepatitis B and C transmission.

In addition, Mahmood & Hassan [28] in the study termed "Assessment Barbers Knowledge's and Practice's About Hepatitis Virus in Mosul City, Iraq", found out that the knowledge of barbers was under the required level and that their degrading practices were not appropriate and this had a negative impact on society directly. Also, Abdullah [29] in the cross sectional study entitled" Knowledge and practices of beauty shop workers regarding blood borne diseases in Abha and Khamis Mushait, Saudi Arabia" revealed that the respondents showed insufficient knowledge and their current practices are at risk to spreading these infections.

Moreover, Krishanani, [30] in their study about" Educational Intervention among Barbers to Improve Their Knowledge regarding HIV/AIDS: A Pilot Study from a South Asian Country", revealed that barbers had insufficient level of knowledge in the Pre-intervention phase. Also, Amodio, [31] in the study entitled" Knowledge, attitudes and risk of HIV, HBV and HCV infections in hairdressers of Palermo City (South Italy)", depicted that there were some unsafe practices that may lead to infections due to blood-borne viruses.

Also, Alemairy [32] in their study entitled" HIV, HBV and HCV Knowledge and Practice among Barbers and Women Hairdressers (coiffeurs): A Cross Sectional Study in Khartoum State, Sudan", concluded that knowledge of barbers and coiffeurs was generally poor and their practice may lead to spread of the blood borne disease.

On the other hand the study conducted by Ataei & Shirani [33] about" Evaluation of knowledge and practice of hairdressers in men's beauty salons in Isfahan about hepatitis B, hepatitis C, and AIDS in 2010 and 2011, Iran", revealed that nearly two thirds of the barbers had desirable knowledge regarding HCV, HBV and AIDS. Also, Abdelrahim [21] showed that most of the barbers had positive attitude regarding HCV and HBV. In the same vein, Abbasi, [27] stated that the majority of barbers had a favorable attitude. Furthermore, Hakim [34] in their

study named" Occupational health risks of hairdressers: knowledge, practice, and self-reported symptoms, Egypt", depicted that barbers' practice was good.

Moreover, Almasi, [35] in the Survey about" Knowledge, Attitude and Performance of Female Barbers in Relation to Job's Environmental Health: A Case Study of Malayer City, Iran", detected that 86.66% of people have attained correct awareness of regulations and 92.28% had positive attitude toward regulations and 86.38% of people in this study showed appropriate health practice. Moreover, Almasi [36] in the study named" Comparative study of awareness, attitude, and performance of hairdressers in west regions of Iran in terms of personal hygiene, decontamination of tools and devices, and general status of building", stated that awareness, attitude, and performance of hairdressers in west regions of Iran were at an acceptable level.

On examining the effect of the implemented health guidelines on the studied barbers' total knowledge, attitude and practice scores. It was found that there was a highly statistically significant improvement in their total level of knowledge, attitude and practice in post-test. This remarkable and obvious improvement could be attributed to the effect of the implemented health guidelines, which included all information and skills required for the barbers to be healthy and helping them to avoid the chances of developing blood borne diseases among barbers and their customers at the workplace and to the fact that it was custom-tailored to barbers' needs. These findings strongly support the hypotheses that the level of workers' knowledge, attitude, and practice will be improved after implementation of the health guidelines.

These findings were supported by Krishanani [30] revealed that there was obvious improvement in barbers' total knowledge after implementation of the educational intervention; also, there was statistical significant differences between pre and post knowledge of the barbers. Also, Nassaji [37] in their study about the effects of interventional health education on the conditions of hairdressing salons and hairdressers behaviors, Iran", concluded that the findings revealed a significant improvement in most items especially for environment of salons, use of personal instruments, waste disposal, safety and healthy behaviors of hairdressers after implementation of the health intervention.

In the same respect Hussain [38] in the study entitled" Knowledge and practices regarding hepatitis B virus infection and its prevalence among barbers of rural area of Rahim YarKhan, Pakistan", told that by launching health education and motivational programs, barber's knowledge and attitude towards safe practice can be improved.

In the same vein, Mahmood [28] recommended Launching health education programs for professionals who are related to individuals in the community. Behavior exchange campaigns for barbers and focuses on them with the aid of occupational safety committees to improve their knowledge, attitude and practices. Also, Eyo [39] in the study named" Knowledge, Attitudes and Practices of Hand Washing Towards the Prevention of Transmissible Diseases among Hair Dressers in Uyo Metropolis of AkwaIbom State, Nigeria", emphasized on the importance of conducting health education to hairdressers to create awareness in the need for proper hand washing technique and prescribed standard for hairdressing salons should

include adequate hand washing facilities to ensure regular and proper hand washing technique during working hours by hair dressers.

Moreover, Wakjira [40] in the study termed" Assessment on Knowledge, Attitude and Practice with Regard to the Transmission and Prevention of HIV/AIDS among Barbers and Beauty Salon Workers in Hossana Town, South Ethiopia", stated that Health Education strategies such as training, supportive supervision and peer education are needed to facilitate the adoption of effective precaution Measures against HIV infection among Barbers and Beauty salon workers. In addition, the study conducted by Ismail [41] about" knowledge, attitudes and practices among male hairdressers towards HIV/AIDS, Sudan", detected that that the practices observed by barbers may favor transmission of HIV and there is a scope for educational intervention.

Furthermore, Amodio [31] stated that the present article highlights the need to improve specific health messages in media campaigns carried out to general population, diffusing more appropriate educational materials for salons and organizing obligatory refresher courses for the hairdressing sector. In addition, Jabari [42] conducted a study named" From the Bench to the Barbershop: Community Engagement to Raise Awareness about CA-MRSA and HCV, New York ", found out that Knowledge about CA-MRSA risks and infection prevention measures, as well as Hepatitis C knowledge and prevention increased after pre and post intervention.

Also, Jokhio [25] in the study termed" Knowledge, attitudes and practices of barbers about hepatitis B and C transmission in Hyderabad, Pakistan", concluded that Strategies and health intervention programs are needed for raising awareness and regulations of barbers' practices. In addition, Hakim [34] reported that it is necessary to disseminate general safety guidelines and offering more training courses to barbers to enhance this occupational sector.

In the same context, Haughtigan [43] in the study entitled" Occupational Skin Disease Prevention An Educational Intervention for Hairdresser Cosmetology Students, United States", depicted that Statistically significant increases in knowledge, frequency of glove use, and frequency of moisturizer use were found. In addition, the Behavioral Strategies subscale, the Intention subscale, and the Expectancies subscale showed statistically significant improvements after educational intervention implementation. Furthermore, Bregnhøj [44] in an intervention study about" Prevention of hand eczema among Danish hairdressing apprentices, Denmark," showed significant improvement in the use of gloves and less incidence of hand eczema in hairdressing students following an educational intervention.

Regarding correlation between total knowledge scores of the study group and their total practice scores. The results of the current study pointed out that there was a statistically significant positive correlation between the total knowledge score of the study group and their total practice score. Thus, when knowledge improves, practice tends to be more healthy (good). If barbers have good knowledge about HCV and HBV, they would have an opportunity to easily practice.

This result was supported by Almasi [36] revealed that while the people's awareness level was more, their performance has would be gained. On the other hand, the study carried out by Abdolahi [45] in Iran, indicated knowledge and performance was no treated with each other.

Regarding correlation coefficient between total knowledge scores of the study group and their total attitude scores. The results puzzled out that there was no statistically significant correlation between total knowledge of the study group and their attitude throughout the educational guidelines. This could be attributed to the fact that attitude as a feeling or opinion of a person toward something or someone is often very difficult to change and modify even they are more knowledgeable. In respect of the correlation coefficient between total practice scores of the study group and their total attitude scores throughout the educational guidelines, the current study submitted that there was no statistically significant correlation between the total practice of the study group and their total attitude scores. This might be due to the fact that safe practices do not necessarily depend on the appropriate attitude of the barbers and vice versa.

This finding was in contrast with, Almasi [36] demonstrated a significant correlation between total knowledge of barbers and their otal attitude scores & total practice scores of the study group and their total attitude scores. Correspond to Ghiyasi [46] research on Barbers' knowledge and attitudes, the result showed that knowledge and attitudes in Sabzevar city were interrelated which have inconsistency with the results of this study.

Furthermore, Bawany [47] in the study about" Knowledge and Practices of Barbers Regarding HIV Transmission in Karachi, Pakistan", showed that the awareness of the Hairdressers was coordinate with performance.

Results of the current study elaborated that intervention was the most predictors through pre and post intervention phases which confirmed the importance of the health guidelines in improving barbers' knowledge, attitude, and practice. This finding was matched with Nassaji [37] who demonstrated that the intervention was successful in improving most aspects of hairdressing and was the most predictor in improving hairdressers' behaviors and practices.

Furthermore, Haughtigan [43] told that the educational interventions may provide a cost-effective venue and have the potential to increase the use of preventive practices and enhance both knowledge and attitude of hairdressers. Also, this study confirmed the importance of intervention as the most predictor in changing knowledge, practices and behaviors for the better.

5. Conclusion

Based on the present study findings and research hypothesis, it can be concluded that:

More than three quarters of the study group had poor total knowledge, most of them had negative attitude as well as unsatisfactory total practice regarding HCV and HBV before the application of the educational guidelines, a remarkable improvement after the implementation of the educational guidelines, had been detected with highly

statistically significant differences between pre and post phases. In addition, the implementation of the intervention guidelines had been the most predictor variable. Therefore, the educational guidelines were successful in attaining its aim of positively changing knowledge, attitude and practice of the study group regarding HCV and HBV.

6. Recommendations

From the results of the present study, the following recommendations are suggested:
1. Main focus should be on launching health education programs and behavior change communication campaigns for the barbers.
2. Strict legislative actions should be taken against practices of barbers of risky behaviors during shaving and hair cutting.
3. Screening of the barbers for hepatitis B and C should be considered before issuance of license and registration& periodically.
4. Health care professionals, mass media and other stakeholders should play an important role in spreading awareness in general public especially the barbers.
5. Uses preparing & recurrent training to be accessible for free, total scope of immunizations together with nonstop supervision for worldwide precautions use and offering emphasis for a new barbers orientation about job-related blood borne virus.
6. Further researches are needed to provide more information regarding the awareness & behaviors of barbers regarding hepatitis B &C transmission & prevention.

References

[1]   Mohamoud Y, Mumtaz G, Riome S, Miller DeWolfe and Abu-Raddad L, (2012): The epidemiology of hepatitis C virus in Egypt: A systematic review and data synthesis, Bio-Medical Center of Infectious Diseases; pp 13: 288.

[2]   Shah, H., Dar, M., Jamil, A., Atif, I., Ali, R., Sindhu, A., &Usmani, A. (2015). Knowledge, Attitudes, and Practices of the Hepatitis B and C among Barbers of Urban and Rural Areas of Rawalpindiand Islamabad. J Ayub Med Coll Abbottabad; 27(4): 832-736.

[3]   Franco E, Bagnato B, Marino MG, Meleleo C, Serino L, Zaratti L.(2012). Hepatitis B: Epidemiology and prevention in developing countries. World J Hepatol. 4(3):74-80.

[4]   Elizabeth, W.,& Ramsey, C. (2011). Global Epidemiology of Hepatitis B Virus (HBV) Infection. NAJMS 4(1): 7-13.

[5]   Messina, J., Humphreys, I., Flaxman, A., Brown, A., Cooke, G., Pybus, O., Barnes, E. (2015). Global Distribution and Prevalence of Hepatitis C Virus Genotypes. Hepatology; 61(1): 77-87.

[6]   Daka, D. (2017). Barber's knowledge and practice of biological hazards in relation to their occupation: A case of Hawassa Town, Southern Ethiopia. J. Public Health Epidemiol. 9(8): 219-225.

[7]   Waheed, Y., Sher, Z., &Qadri, I. (2011). Role of Potash Alum in Hepatitis C virus Transmission at Barber's Shop. Virol. J; 8(1): 211.

[8]   Petruzziello A, Marigliano S, Loquercio G, Cozzolino A, Cacciapuoti C. Global epidemiology of hepatitis C virus infection: An up-date of the distribution and circulation of hepatitis C virus genotypes. World J Gastroenterology. 2016; 22(34): 7824-40.

[9]   Shalaby S, Kabbash IA, El Saleet G, Mansour N, Omar A, El NawawyA. Hepatitis B and C viral infection: prevalence, knowledge, attitude and practice among barbers and clients in Gharbia governorate, Egypt, East Mediterr Health J 2012; 16 (1): 10-7.

[10] Khosravanifard B, Rakhshan V, Najafi-salehi L, Sherafat S. Tehran D.' knowledge and attitudes towards hepatitis B and their willingness to treat simulated hepatitis B positive patients. EMHJ. 2014; 20 (8):498-507.

[11] Biadgelegn, F., Belyhun, Y., Anagaw, B., Woldeyohannes, D.,Moges, F., Bekele, A., &Mulu, A. (2012). Potential risk of HIV transmission in barbering practice in Ethiopia: from public health and microbiological perspectives. BMC Public Health. 12(707): 1-14.

[12] Mele, A. (2010). Beauty treatments and risk of parenterally transmitted hepatitis: results from the hepatitis surveillance system in Italy. Scandinavian Journal of Infectious Diseases; 27(5): 441- 444.

[13] Mariano, A. (2011). Role of beauty treatment in the spread of parenterally transmitted hepatitis viruses in Italy. Journal Medical Virology; 74 (67): 216-220.

[14] World Health Organization (2011). Weekly epidemiological record. Bulletin of the World Health Organisation, 276 (181), 12-13.

[15] Mutocheluh, M., & Kwarteng, K. (2015). Knowledge and occupational hazards of barbers in the transmission of hepatitis B and C was low in Kumasi, Ghana. Pan Afr Med J; 20 (260): 1-7.

[16] Dahlström, E., & Viberg, E. F. (2013). Knowledge about hepatitis B virus infection and attitudes towards hepatitis B virus vaccination among Vietnamese university students in Ho Chi Minh City. Retrieved from diva portal organization:

[17] Aluko, O., Adebayo, A., Adebisi, T., Ewegbemi, M., Abidoye, A., &Popoola, B. (2016). Knowledge, attitudes and perceptions of occupational hazards and safety practices in Nigerian healthcare workers. BMC Res Notes; 9 (71): 1-14.

[18] Razavi H, Elkhoury AC, Elbasha E, Estes C, Pasini K, Poynard T, et al. Chronic hepatitis C virus (HCV) disease burden and cost in the United States. Hepatology (Baltimore, Md). 2013; 57(6): 2164-70.

[19] Mohamoud Y, Mumtaz G, Riome S, Miller DeWolfe and Abu-Raddad L, (2012): The epidemiology of hepatitis C virus in Egypt: A systematic review and data synthesis, Bio-Medical Center of Infectious Diseases; pp 13: 288.

[20] WHO. Hepatitis C fact sheet no. 164 [updated July 2015]. 2016. 5.

[21] Abdelrahim, S., Mohamed, M., Ahmed, S., & Zakria, M. (2015). Sero-prevalence, Knowledge, Attitude and Practices among Barbers and Their Customers Regarding HCV and HBV in Assiut District, Egypt.IOSR Journal of Nursing and Health Science. 4(3): 19-30.

[22] Abubakar, A., Dangana, I., John, B., Gobir, A., Ibrahim, M., Umar, A., Bashir, S., Shehu, A. (2017). Perceptions and practices related to health hazards of patronizing traditional nail cutters and barbers among market men in Samaru – North Western Nigeria. Sub-Saharan African Journal of Medicine. 4(2): 37-42.

[23] Al-Thaqafy M, Balkhy H, Memish Z, Makhdom Y, Ibrahim A, Al-Amri A and Al-Thaqafi A, (2009): Improvement of the low knowledge, attitude and practice of hepatitis B virus infection among Saudi National Guard personnel after educational intervention, BMC research notes, pp 5:597.

[24] Khairkhah, T., Shamsa, A., Roohi, A., Khoshnoodi, J., V and Rajabpour, F., Tabrizi, M., Zarei, S., Golsaz-Shirazi, F., & Shokri, F. (2016). Analysis of Knowledge, Attitudes, and Prevalence of Hepatitis B and C Seromarkers Among Barbers in Tehran. Hepat Mon; 16(9):1-8.

[25] Jokhio, A., Bhatti, T., &Memon, M. (2010). Knowledge, attitudes and practices of barbers about hepatitis B and C transmission in Hyderabad, Pakistan. East Mediterr Health J; 16(10): 1079-84.

[26] Aziz, S., Atif, I., Sadiq, T., & Rashid, F. (2016). Knowledge, Attitude and Practices of Barbers about Hepatitis B&C Transmission in Islamabad. JIIMC; 11(3):103-107.

[27] Abbasi, I. Fatmi, Z., Kadir, M., & Sathiakumar, N. (2014). Prevalence of hepatitis B virus infection among barbers and their knowledge, attitude and practices in the district of Sukkur, Sindh. Int J Occup Med Environ Health; 27(5): 757-765.

[28] Mahmood, H., & Hassan, E. (2018). Assessment Barbers Knowledge is and Practice's About Hepatitis Virus in Mosul City. Mosul Journal of Nursing; 11(6):488-493.

[29] Abdullah, L., Anfal, A., Sarah, A., Shatha, A., Wafaa, J., Hatim, A., & Salman, L. (2017). Knowledge and practices of beauty shop workers regarding blood borne diseases in Abha and Khamis Mushait: a cross sectional study. International Journal of Advanced Research; 5(6): 330-336.

[30] Krishanani, M., Ali, F., Khuwaja, A., Qidwai, W., & Ali, B. (2014). Educational Intervention among Barbers to Improve Their Knowledge regarding HIV/AIDS: A Pilot Study from a South Asian Country. J Health Popul Nutr; 32(3): 386-390.

[31] Amodio, E., Benedetto, M., Gennaro, L., Maida, C., & Romano, N. (2009). Knowledge, attitudes and risk of HIV, HBV and HCV infections in hairdressers of Palermo city (South Italy).The European Journal of Public Health; 20(4):433-7.

[32] Alemairy, A., Ahmed, H., Swareldahab, Z., Saad, F., Alaimeri, A., Alemairy, A. & Elhassan, M. (2016). HIV, HBV and HCV Knowledge and Practice among Barbers and Women Hairdressers (coiffeurs): A Cross Sectional Study in Khartoum State. American Journal of Epidemiology and Infectious Disease; 4(5), 84-90.

[33] Ataei, B. &Shirani, K. (2012). Evaluation of knowledge and practice of hairdressers in men's beauty salons in Isfahan about hepatitis B, hepatitis C, and AIDS in 2010 and 2011. Advanced Biomedical Research; 1(4):1-6.

[34] Hakim, S., & Abdel-Hamid, M. (2019). Occupational health risks of hairdressers: knowledge, practice, and self- reported symptoms. Egyptian Journal of Occupational Medicine; 43 (1): 161-174.

[35] Almasi, A., Mohamadi, M., Poursadeghiyan, M., Sohrabi, Y., Mohamadi, S., &Komijani, M. (2016). Knowledge, Attitude and Performance of Female Barbers in Relation to Job's Environmental Health: A Case Study of Malayer City. Iranian Journal of Health, Safety & Environment; 3(3): 573-577.

[36] Almasi, A., Dargahi, A., Mohammadi, M., Amirian, F., Shokri, A., & Tabandeh, L. (2016). Comparative study of awareness, attitude, and performance of hairdressers in west regions of Iran in terms of personal hygiene, decontamination of tools and devices, and general status of building. Journal of Chemical and Pharmaceutical Sciences; 9 (4):3065-3062.

[37] Nassaji et al., (2015).The Effects of Interventional Health Education on the Conditions of Hairdressing Salons and Hairdressers Behaviors. Middle East J Rehabil Health; 2(1):1-6.

[38] Hussain, I., Bilal, K., Afzal, M., & Arshad, U. (2018). Knowledge and practices regarding hepatitis B virus infection and its prevalence among barbers of rural area of Rahim Yar Khan. JSZMC; 9(2):1423-1426.

[39] Eyo, U., & Ukpe, E. (2016). Knowledge, Attitudes and Practices of Hand Washing Towards the Prevention of Transmissible Diseases among Hair Dressers in Uyo Metropolis of AkwaIbom State. European Journal of Business and Management; 8 (22): 223-232.

[40] Wakjira, A. (2017). Assessment on Knowledge, Attitude and Practice with Regard to the Transmission and Prevention of HIV/AIDS among Barbers and Beauty Salon Workers in Hossana Town, Ethiopia. JBR Journal of Clinical Diagnosis and Research; 5(1): 1-8.

[41] Ismail, M. (2017). Knowledge, attitudes and practices among male hairdressers towards HIV/AIDS. Ejpmr; 4 (5): 6-10.

[42] Jabari, (2016). From the Bench to the Barbershop: Community Engagement to Raise Awareness about CA-MRSA and HCV. Prog Community Health Partnersh; 10(3): 413-423.

[43] Haughtigan, K., Main, E., Underwood, T., & Watkins, C. (2017). Occupational Skin Disease Prevention an Educational Intervention for Hairdresser Cosmetology Students. Workplace Health Saf; 65(11):539-545.

[44] Bregnhøj, A., Menné, T., Johansen, J., & Søsted, H. (2012). Prevention of hand eczema among Danish hairdressing apprentices: an intervention study. Occup Environ Med; 69(5): 310-6.

[45] Abdolahi, A., Anaraki, R., Khodabakhshi, M., &Behnampoor, N. (2013). Determination of Knowledge, attitude and performance (KAP) of Golestan university medical science nurses about hospital infection control. Journal of Gorgan University Medical Science; 5 (11): 80-86.

[46] Ghiasi, M., zadeh, M., Khamirchi, R., Akabery, A. (2008).Survey of acknowledge attitude and performance of Sabzevar barber relation to hepatitis B in 2008. Journal of Sabzevar University; 14(3, 4): 2-9.

[47] Bawany, F., Khan, M., Shoaib, A., Naeem, M., Kazi, A., Shehzad, A. (2014).Knowledge and Practices of Barbers Regarding HIV Transmission in Karachi: A Cross Sectional Study. J community health; 39 (1):1-5.