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Factors Influencing Hepatitis B Vaccination Completion Among Medical Students at the Kampala International University Western Campus (KIU-WC) in Ishaka, Bushenyi District, Uganda

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ABSTRACT

This study determined the proportion of hepatitis B vaccination completion among KIU-WC medical students. The study used a quantitative approach, collecting data through questionnaires and SPPS version 22. The majority of participants are aged 25-35 years, with 145 males and 79.3% in their 5th year medical school. The majority are Christians, with 81.1% being sponsored by parents or guardians. The rate of hepatitis B vaccination completion is 60.7%. Factors associated with hepatitis B completion include being Muslim, being privately sponsored, and being knowledgeable about post-exposure prophylaxis. Reasons for incomplete vaccination include vaccine cost (30.5%), absence of vaccinator (12.2%), and fake vaccines (9.8%). The high rate of faulting of Hepatitis B vaccination warrants redress to curb mortality due to chronic Hepatitis B. The study highlights the need for improved vaccination practices to reduce the global public health problem.

Keywords: Completion, hepatitis B, vaccination students

INTRODUCTION

Hepatitis B virus (HBV) infection is a global public health problem. Worldwide estimates suggest that more than 2 billion people have been infected with HBV, and that 248 million of these people are chronically infected. About 15% to 25% of persons with chronic HBV infection die from cirrhosis or liver cancer. The Global Burden of Disease study estimated that there were 686,000 deaths caused by hepatitis B in 2013 and a 5.9 per 100,000 age-standardized death rates globally, of which 300,000 deaths were attributed to liver cancer and 317,400 deaths to cirrhosis of the liver secondary to hepatitis B. This rate represents a substantial global burden, with wide global geographic variation [1, 2]

In USA, hepatitis B vaccination has been highly recommended to persons at increased risk of acquiring the HBV infection and to those traveling to highly endemic areas however in 2015 hepatitis B vaccination coverage of at least 1 dose was 38.6% significantly higher compared with 25.9% non-travelers. Series completion of at least 3 doses was 31.7% and 21.2%, respectively [3].

Hepatitis B prevalence (HBsAg) is highest in the sub-Saharan African and western Pacific regions, considered high-intermediate to high endemicity countries (5% to ≥ 8% prevalence), and prevalence estimates exceed 15% in several countries [1].

In Ghana, HBV is considered to be of significant public health importance and a disease that requires greater attention. Ghana has been grouped as part of the areas of the world where the prevalence of chronic HBV infection is high (≥8 %) Sweitzer et al. for instance in estimating the global burden of hepatitis B in 2013, put the prevalence of chronic hepatitis B virus infection in Ghana at 12.92 % [4, 5, 6].

In Nigeria a study was conducted at Obafemi Awolowo University Teaching Hospital to find out how many of the medical care workers i.e. (medical Doctors, Nurses, Pharmacists and Lab technicians) had completed hepatitis b vaccination, out of 382 workers, 65% had fully completed the dose [7, 8,].

In Kenya, HBV is highly prevalent and it accounts for about 44% of the cases with chronic liver disease, and the prevalence of hepatitis B and chronic hepatitis B varies between 5-30% and 6-12% respectively in the general population and 8.8% among the HIV infected persons [9, 10, 12, 13]. In Kenya, research was conducted among HCW and it was found out of 384 HCW, 229 (59.6%) had been vaccinated against Hepatitis B virus while 155 (40.4%) had not. This number was slightly above half of the respondents, an indication that uptake of Hepatitis B vaccine is still a major challenge among the HCW. Of those who were vaccinated, only 123 (53.7%) were fully vaccinated with the recommended three doses of the vaccine [14, 15, 16].

According to the 2016 Uganda Population-based HIV Impact Assessment (UPHIA) Survey, prevalence of Hepatitis B infection among adults stands at 4.3% (5.6% among men and 3.1% among women). The survey indicates that Hepatitis B prevalence is highest in Northern region with 4.6% in mid North, 4.4% in North East and 3.8% in West Nile. Hepatitis B infection was lower in the rest of the country with a range of 0.8% in South West region to 2.7% in East Central region. In northern Uganda the first reported national hepatitis B serosurvey, it was confirmed that HBV infection is highly endemic in Uganda [17, 18, 19, 20], with an estimation of up to 90% of perinatal HBV infections, and 20 to 60% of infections occurring between the ages of 1 to 5 years, and 5 to 10% of infections occurring above 5 years become chronic [21, 1, 22, 23]. The government of Uganda through the ministry of health has urged Ugandans to take up the vaccination doses however, this enforcement has not been a success to all individuals due to unknown factors because some have been seen getting initial vaccine dose yet a few complete all the 3 doses [24, 25].

METHODOLOGY

Study Design

A descriptive [26] and analytical cross-sectional study design was used employing a quantitative study approach to determine the completion rate, factors associated and reasons for incompletion of Hepatitis B vaccination among medical students attending KIU-western campus.

Study Area

The study will be conducted in Kampala international university western campus which is located in Ishaka, Ishaka-Bushenyi municipality, Bushenyi district western Uganda.

Study Population

The study population was KIU medical students in clinical years who have heard and taken an initiative to get Hepatitis B Vaccine dose.

Sample Size Determination

Sample size for proportions (n_o) will be determined using the Kish Leslie Formula (1965),

$$n_0 = \frac{Z^2 * p * (1-p)}{r^2}$$

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

n= desired sample size for a finite population

N = Population size

Z = Standard normal deviate (1.96 for a 95% confidence interval)

P= Completion rate of 59.6% of hepatitis B vaccination in Kenya among Health workers. [14]

r = the level of precision desired (0.05)

Sample size: 370

KIU-WC has approximately 1000 students in clinical years

Therefore, the sample size has been adjusted using the available population of 1934.

$$n = \frac{370}{1 + \frac{370}{1000}} = 270$$

Therefore, the study used a sample size of 270 participants

Inclusion Criteria

Any KIU medical student that who had received at least 1st dose of Hepatitis B

vaccination, had spent a minimum of 6 months in Ishaka and consented to the study was enrolled to the study.

Exclusion Criteria

Any member who did not consent, those who had been vaccinated less than 6month before the study and those who have never been vaccinated for Hepatitis B. were excluded from the study.

Sampling Method

Clustered sampling technique was employed where study participants were clustered according to the site where they are i.e. jinja RRH, Hoima RRH, Mubende RRH, Fortportal RRH, KIUTH and Kiryandongo general hospital. A total of 45 study participants were enrolled from each site by simple random sampling technique where one member from the clinical years was contacted to participate would introduce the researcher to another participant until a required sample size of 270 participants was realized.

Data Collection Method

Self- administered questionnaires were used to collect the data on the demographics, awareness of Hepatitis B, knowledge and reasons for not completing the vaccination. The questionnaires used close ended questions.

Data Analysis Method

Data will be analyzed a per objective;

The proportion of Hepatitis B vaccination completion will be analyzed using univariant analysis and presented as a percentage.

The social demographics and awareness factors associated with completion of Hepatitis B vaccination will be analyzed using bivariant and multivariant level analysis with significance set at 95% Confidence interval. Any factor that will be significant at bivariant level will be subjected to multivariant level analysis to establish the association with P-value od <0.05 significance and 95% confidence interval. It will be presented in table with odds ratio.

The reasons for incomplete vaccination against hepatitis b will be analyzed using univariant analysis and presented into a bar graph showing frequencies.

Ethical Considerations

The researcher sought approval from the university Research and Ethics Committee (REC) and an introductory letter from the dean of Faculty of clinical medicine and dentistry Kampala International University WC was obtained. Informed consent was sought from the individual study participants before enrolling them in the study. Confidentiality was maintained as the questionnaires did not contain participants names [27]. The researcher reassured the participants that their participation was purely voluntary and were free not to answer any question, and were free to exit anytime in the course of the study. Data collected from the individual participants was maintained under pass word protected files only accessible to the researcher.

RESULTS

All the participants were between the age of 25-35 years of age and all were student doing bachelor of medicine and bachelor of surgery.

Majority of the study participants were males 145(53.7%) in the fifth year of medical training in bachelor of medicine and bachelor of surgery 214 (79.3%). By marital status, majority of the participant 191(70.7%) were single while 41 (15.2%) were married. Christianity was the dominant religious belief among the study participants 219(81.1%) with Muslims making 35(13.0%) and others were 16(5.95).

Parents/guardians were the most sponsors of the study participants 230(85.2%) followed by government scholarship 26(9.6%) and other form of scholarships were 14 (5.2%). Consequently, parents provided the up-keep for most of the study participants 185(68.5%) followed by guardians 39(14.4%) with others taking the least with 10 (3.7%). This is as shown in table 1 below.

Table 1: A table showing demographic characteristic of the study participants

Variable	Frequency	Percentage
Sex		
Male	145	53.7
Female	125	46.3
Academic Year		
Fourth	56	20.7
Fifth	214	79.3
Marital status		
Single	191	70.7
Married	41	15.2
Others	38	14.1
Religion		
Christian	219	81.1
Moslem	35	13.0
Others	16	5.9
Tuition scheme		
Government	26	9.6
Private (parent/guardian)	230	85.2
Other private sponsorships	14	5.2
Source of up-keep		
Parents	185	68.5
Guardian	39	14.4
Self	36	13.3
Others	10	3.7

60.7% of the study participants completed the 3 recommended doses of hepatitis B vaccination. This is a shown in figure 1 below.

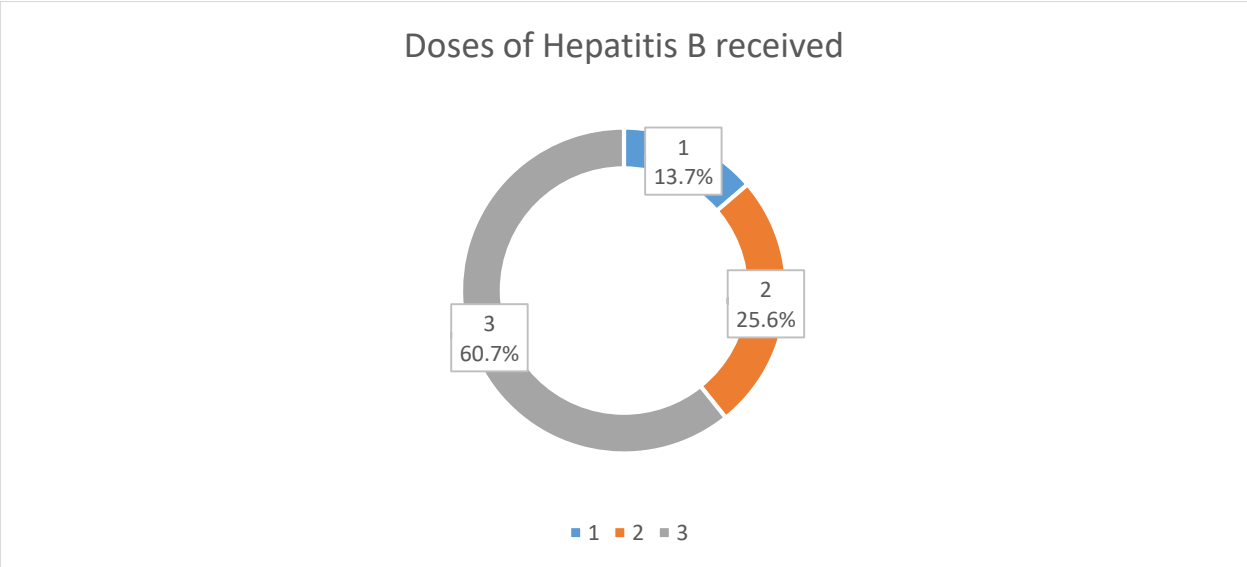

Figure 1: A pie-chart showing proportion of hepatitis B vaccine completion

At bivariant level, sex, marital status, up-keep source, and knowledge of hepatitis b sufferer were not significant as shown in table 2 below.

On the other hand, religion, tuition scheme, knowledge of hepatitis B post exposure prophylaxis, perceived individual exposure level and reason for vaccination were significant with P-value of 0.002,0.031,0.001,0.012 and 0.001 respectively at 95% confidence interval. This is a shown in table 2 below

Table 2: A table showing Bivalent level analysis of associated factors

Variable	Complete vaccination		Chi-square	P-value
	Yes (%)	No (%)		
Sex				
Male	82(50.0)	63(59.4)	2.305	0.129
Female	82(50.0)	43(40.6)		
Marital status				
Single	120(73.2)	71(67.0)		
Married	20(12.2)	21(19.8)	2.901	0.234
Other	24(14.6)	14(13.2)		
Religion				
Christian	144(87.8)	75(70.8)		
Moslem	14(8.5)	21(19.8)	12.246	0.002
Others	6(3.7)	10(9.4)		
Tuition scheme				
Government	18(11.0)	8(7.5)		
Private(parents/guardian)	142(86.6)	88(83.0)	6.958	0.031
Other private sponsorship	4(2.4)	10(9.4)		
Up-keep source				
Parents	122(74.4)	63(59.4)		
Guardians	18(11.0)	21(19.8)		
Self	18(11.0)	18(17.0)	7.326	0.062
Others	6(3.7)	4(3.8)		
Knowledge of Hepatitis B suffer				
Yes	147(89.6)	89(84.0)	1.882	0.170
No	17(10.4)	17(16.0)		
Knowledge of Hepatitis B PEP				
No	57(34.8)	19(17.9)		
Yes	50(30.5)	27(25.5)	14.140	0.001
Don't know	57(34.8)	60(56.6)		
Individual Risk level				
No risk of exposure	16(9.8)	8(7.5)		
Low risk of exposure	33(20.1)	8(7.5)	8.911	0.012
High risk of exposure	115(70.1)	90(84.9)		
Reason for Vaccination				
Fear	98(59.8)	41(38.7)	11.451	0.001
Requirement by University and MOH	66(40.2)	65(61.3)		

The factors that were significant at bivariant level analysis with P-value of <0.05 was carried forward for multivariant level analysis as shown below in table 3.

Table 3: A table showing Multivariant level analysis of associated factors for completion of hepatitis B vaccination

Variable	P-value	Odds Ratio	95% C.I for Odds ratio	
Religion				
Others	-1-			
Moslem	.012	2.893	1.259	6.647
Christian	.088	2.947	.852	10.196
Tuition scheme				
Other private sponsorship	-1-			
Private (parents/guardian)	.012	8.072	1.584	41.134
Government	.206	1.860	.711	4.865
Perceived Individual risk				
No risk of exposure	-1-			
Low risk of exposure	.356	.542	.148	1.988
High risk of exposure	.337	1.639	.598	4.490
Reason for vaccination				
University and MOH requirement	-1-			
Fear	.252	1.407	.785	2.524
Knowledge of Hepatitis B PEP				
Don't know	-1-			
Yes	.015	.418	.207	.844
No	.251	.688	.363	1.302

At multivariant analysis, knowledge of sufferer for hepatitis B, perceived individual risk level and reason for vaccination were not statistically significant.

Religion, tuition scheme and knowledge of hepatitis B post exposure prophylaxis were significantly associated with completion of hepatitis b vaccination.

Moslem religion affiliation was associated with a 2.893 times increased chances of completing hepatitis b vaccination (P=0.012, OR=2.893, 95% C.1 1.259-6.647) compared to other religious beliefs. Christianity religious belief was associated with 2.947 increased odds for completing vaccination compared to other religious beliefs but it was not statistically significant (p-value =0.088, OR 2.947 95%C. I 0.852-10.196).

Students sponsored by their parents or guardians had 8.072 increased odds for competing hepatitis B vaccination compared to those of other private sponsorships and it was statistically significant (P-value 0.012, OR 8.072, 95% C.I 1.584-41.134). those participant on government scholarship were 1.860 times more likely to complete their vaccination compared to those with other private sponsorship but it was not statistically significant. (P-value = 0.206, OR =1.860, 95% C.I 0.711-4.865).

Participants who were knowledgeable about the existence of post exposure prophylaxis of hepatitis B were 0.418 reduced chances of completing hepatitis b vaccination compared to their counter parts who were not aware of post exposure prophylaxis and it was statistically significant (P-value=0.015 OR=0.418 95% C.I 0.207-0.844). those participants who were knew that there is no prophylaxis for Hepatitis B were 0.688 times less likely to complete Hepatitis B vaccination compared to those who didn't know about post exposure prophylaxis for hepatitis b but it was not statistically significant (P-

value=0.251, OR=0.688 95% C.I 0.363-1.302). This is as shown in table 3 above 47 (45.6%) of the participants missed the vaccination doses because it was expensive while 20(19.4%) was because the vaccinator was absent, 16 (15.5%) was because of fake vaccines and 14 (14%) was because they forgot the return dates for their vaccinations. This is as shown in figure 2 below.

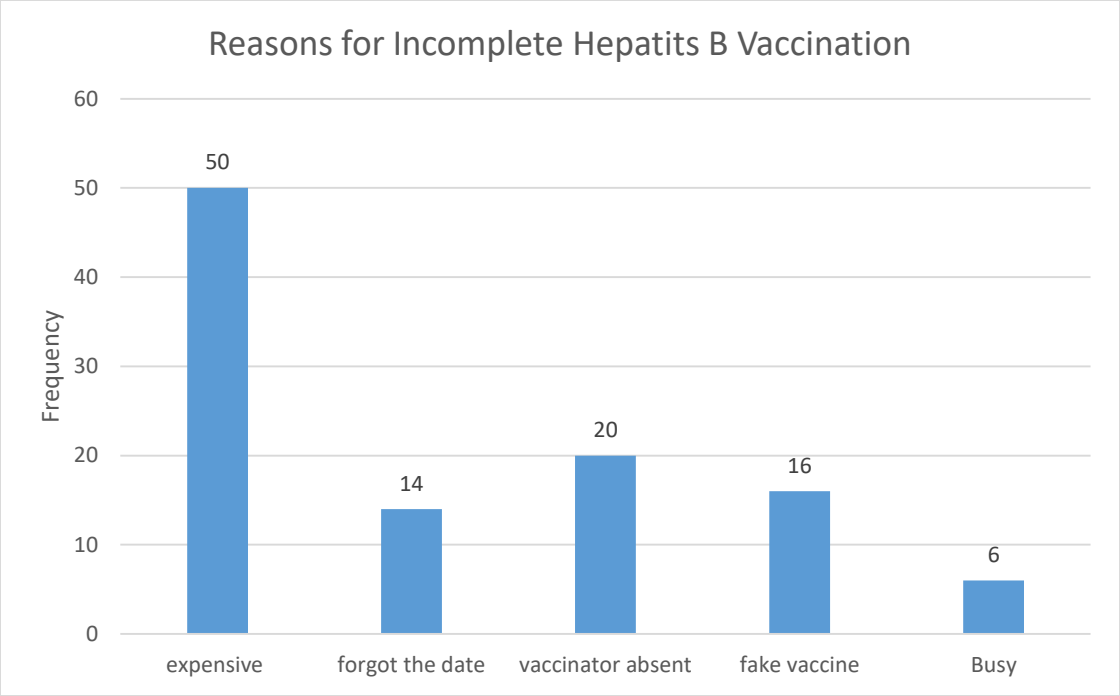

Figure 2: A bar graph showing reasons for not completing Hepatitis B vaccination

DISCUSSION

This study determined the proportional of hepatitis B completion among KIU medical students, reasons for non-completion and factors associated with completion of hepatitis B vaccination.

The proportion of hepatitis B vaccine completion among KIU medical students was found to be 60.7%. this finding is higher than that observed in Babcock university in Nigeria of 56% among undergraduate students [28]. Similarly, the study findings are higher than in Ghana among public health students and in Makerere university of 30.5% and 44.3% respectively [29, 30]. However, these findings are lower compared to those observed in Greece among Medical, Nursing, and Paramedical Students of 88.1% [31].

Among the factors significantly associated with completion of hepatitis B vaccination include Muslim religious affiliation, tuition sponsorship scheme and knowledge of post exposure prophylaxis for Hepatitis B. Muslim religious affiliation was associated with 2.893 times increased likelihood of completing hepatitis b vaccination compared to other religious beliefs (P=0.012, OR=2.893, 95% C.1 1.259-6.647). this finding differs with that observed in a study in Nigeria where Muslim religious affiliation was associated with 0.31 reduced of odds for completion of vaccination however it was not statistically significant. Tuition sponsorship scheme was also found to be significantly associated with completion of hepatitis B vaccination. Private sponsorship by parents/guardians was associated with 8.072 times higher odds to complete vaccination compared to their counterparts in other private scholarships. This agrees with a study in Makerere university that found 2.08 increased odds for hepatitis B vaccine completion (P<0.001). This is attributed to the fact that parent sponsored students are provided

sufficient pocket money, to meet the students' needs including healthcare needs like vaccination [30].

Knowledge of hepatitis B post exposure prophylaxis was associated with 0.418 reduced odds (P-value=0.015 OR=0.418 95% C.I 0.207-0.844) for completing hepatitis b vaccination among KIU medical students compared to their counterparts. This finding however disagrees with the study in Makerere university students which found that there was no association between knowledge category and vaccination status. [30]. Among those with incomplete hepatitis B vaccination, the participants cited vaccines being expensive (30.5%), vaccinator being absent (12.25), fake vaccines (9.8%) and forgetting return date for next appointment (8.5%). These findings agree with findings from other studies. In Makerere university where 63.2% of participants stated high cost of vaccine [30], 67% of participants in Babcock university cited forgetting their next appointment [28] and a study in Wakiso district among health workers reporting 1.72 increased odds for completing vaccination when there's trust that the vaccines are safe [33].

CONCLUSION

The study found that a significant proportion of participants completed hepatitis B vaccinations, with reasons such as high costs, absence of vaccinators, fake vaccines, forgetting return dates, and busyness being the main reasons. Muslim religious affiliation and private sponsorship were found to increase the odds of completing the vaccination, with a significant proportion of participants completing it.

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