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ORIGINAL RESEARCH

Factors Associated with Medical Students' Career Choices Regarding Internal Medicine in Uganda

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Background: There is an unmet need for internal medicine physicians in Uganda owing to the growing burden of diseases. This study aimed at evaluating the factors associated with career choices of undergraduate medical students regarding internal medicine in Uganda.

Methods: We conducted a cross-sectional study in the first 3 weeks of October 2021 via WhatsApp messenger. Medical students in the 3rd to 5th year of study who had completed internal medicine clinical rotations and pursuing a Bachelor of Medicine and Bachelor of Surgery (MBChB) degree at 7 Ugandan universities (4 public and 3 private) were enrolled. Multivariable logistic regression model was constructed to determine factors associated with a career choice in internal medicine.

Results: We enrolled 418 participants, median age was 24 (interquartile range (IQR): 23–26) years, 67.7% were male, and 36.1% had a family member or relative who was a doctor. Most of the students (84.0%) were interested in research. The top three most preferred specialties were internal medicine (52.6%), surgery (51.2%), and obstetrics and gynaecology (51.0%). Overall, 186 (44.5%) participants reported plans to pursue a Master of Medicine degree in internal medicine. Interest in research was the only factor independently associated with 2.5-fold higher odds of pursuing a career in internal medicine (adjusted odds ratio: 2.5, 95% CI: 1.4–4.6, p = 0.003). About 73% of the participants strongly agreed that internal medicine requires wide reading.

Conclusion: There is a strong interest to pursue a career in internal medicine among Ugandan medical students. We recommend an increase in training opportunities in Internal Medicine, especially in view of the growing disease burden and increasing population growth.

Keywords: internal medicine, career choices, Uganda

Background

Internal medicine is one of the oldest medical specialities.[1,2] The American College of Physicians (ACP) describes an internal medicine physician as a specialized medical practitioner who applies scientific knowledge and clinical expertise to the diagnosis, treatment, compassionate and comprehensive care of adults across the spectrum from health to complex illness affecting internal organs and systems.[3] World over, internal medicine physicians play an important role in the management of acutely ill, hospitalized patients as well as those receiving primary care (outpatient) for stable chronic illnesses, general checkups and general wellness consultations.[3]

With the increasing burden of communicable and non-communicable diseases, emerging and re-emerging diseases and pandemics,[4,5] it is important that there is a corresponding increase in the number of physicians to meet the health demand of the growing population. The future of internal medicine specialty depends on the success of the harmonization of postgraduate training programs and continued interest and mentorship of undergraduate medical students to train and practice in the specialty.

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Despite an unmet need for more internal medicine physicians globally,[6] the number of medical students interested in pursuing a career in internal medicine has substantially declined in the last few decades. For example, in the United States (US), the number of medical students matching into internal medicine residency positions declined by 32% between 1985 and 2008.[7] Even worst, the number of US students choosing residency training in primary care internal medicine declined by 54% within the same period.[7] Uganda has an unmet need for physicians with less than 400, majority of whom are practicing in hospitals in major cities and towns or teaching at universities. The intake of students into internal medicine training has been very low over the years and only recently had a slight increase for the internal medicine programme at Makerere University, but this is not enough to meet the demand of the growing population and increasing disease burden and complexity.

Several individual and contextual factors have been found to affect medical students' career preferences in clinical medicine.[8] A study of 1177 fourth-year medical students at 11 US medical schools found that medical students valued the teaching during internal medicine clerkships but expressed serious reservations about internal medicine as a career.[9] Students who reported more favorable impressions of the patients cared for by internal medicine physicians, the internal medicine practice environment, and the internal medicine physicians' lifestyle were more likely to pursue a career in internal medicine. Students were discouraged from internal medicine by their experiences with elderly and chronically ill patients.[9]

A recent study conducted among 5th year medical students of Makerere University, the major and oldest medical training institution in Uganda, showed that only 12.6% of the 135 students surveyed selected internal medicine as their preferred career choice. Our study aimed to explore interest and factors associated with medical students' career choices regarding internal medicine to inform short- and long-term strategies to optimize internal medicine training programs in Uganda.

Methods

Study Design

A descriptive, cross-sectional study was conducted in the first 3 weeks of October 2021.

Study Setting

The study was conducted at 7 of the 10 accredited universities offering an undergraduate Bachelor of Medicine and Bachelor of Surgery (MBChB) in Uganda; four public universities, namely, Makerere University (Mak), Mbarara University of Science and Technology (MUST), Gulu University (GU), and Busitema University (BU); and three private universities, namely, Kampala International University (KIU), Islamic University in Uganda (IUIU), and King Caesar International University (KCU) were included. Of these, Mak, MUST, BU and KIU offer postgraduate training in internal medicine.

Students pursuing the MBChB course take a minimum of 5 years to complete their training in Uganda. In some universities, clinical training is done in third-, fourth- and fifth-years (Mak, MUST), whereas in the rest, the training is offered in fourth- and fifth-year. The seven selected universities together had an estimated number of 3880 students pursuing MBChB and in clinical years of study in the academic year 2020/2021.

Study Population

We included all medical students, 18 years or older in clinical years of training and pursuing MBChB program who had attended internal medicine rotations in the selected universities. Those not in class WhatsApp groups or who declined to participate were excluded.

Sample Size Estimation

The sample size was estimated using Epi Info StatCal for population survey. Using an estimated prevalence of internal medicine choice of 12.6%,[15] acceptable margin of error of 5%, design effect of 1.0 at 95% confidence interval, design effect of 2 and 20% non-response rate, a sample size of 422 was calculated.

Data Collection

The following data were collected: demographics and factors associated with career choice in internal medicine by employing purposive sampling. Independent variables were demographic characteristics including sex, age, year of study, mentorship, and role model. Dependent variable was a career choice in internal medicine as measured by a dichotomous question (Yes/No). Data were collected using a questionnaire designed in a KoboTool Box app (Harvard Humanitarian Initiative, Cambridge, Massachusetts), whose link was shared to students via WhatsApp (Meta, California, USA).

Attitude Score

Attitudes were scored as; strongly agree (5 points), agree (4 points), neutral (3 points), disagree (2 points), and strongly disagree (1 point). The mean attitude score was calculated by dividing the total scores of the participants by the total possible score and results multiplied by 5. A score close to 1 indicated negative attitude, and those near 5 reflect positive attitude towards internal medicine.

Data Analysis

Completed questionnaires were extracted to a Microsoft Excel 2016 spreadsheet for cleaning and coding. Cleaned data were exported to STATA version 16.0 for further analyses. Numerical data were summarized as means (standard deviations) or median (interquartile range) as appropriate and categorical data as frequencies and proportions. Association between career interest in internal medicine and independent variables were assessed using Chi-square or Fisher's exact tests for categorical and Mann–Whitney U or independent sample *t*-test for numerical variables. A multivariate logistic regression analysis model was constructed and included all variables with $p < 0.2$ from bivariate analysis. Results were presented as adjusted odds ratio with their corresponding 95% confidence Interval. A $P < 0.05$ was considered statistically significant.

Results

Demographic Characteristics

Overall, 418 responses (99% response rate) from medical students in the 7 medical schools were received. The median age was 24 (interquartile range (IQR): 23–26) years. Two-thirds (67.7%) of the students were male and most were single (87.6%). There was a good representation from all the seven medical schools, with each contributing over 10% to the overall responses. About 39% were final year students in their fifth year of study and 92.6% were Ugandans by nationality. Some 151 students (36.1%) had a family member or relative who was a doctor, and most of them were practicing general medicine (45%), Table 1.

Career Preferences

Nearly all the students (n = 400, 95.7%) had plans to pursue postgraduate training with 23.4% willing to undertake it in Uganda (Table 2). The top three most preferred specialties were internal medicine (52.6%), surgery (51.2%), and obstetrics and gynaecology (51.0%). About 52.6% of the participants were interested in practicing in the public service, while only 15.1% were interested in administration.

Career in Internal Medicine

Overall, 186 students (44.5%) had plans to pursue a master's degree in internal medicine. Majority were male (70.4%) and in the fifth year of study (36.6%). Makerere (21.5%) and Busitema (19.4%) universities had the highest number of students with interests in pursuing internal medicine. Students who had passion for becoming a doctor constituted 81.2% of those interested in pursuing internal medicine. At bivariate analysis (Table 3), interest in pursuing internal medicine was significantly associated with preference in practicing in the academia (p = 0.035) and students' interests in research (p = 0.001). Age, sex, marital status, students' institution, and year of study were not significantly associated with interest in pursuing internal medicine.

Table 1 Characteristics of the Study Participants

Variable	Frequency	Percent
Age (median, IQR)	24	23–26
18–35 years	228	54.5
≥36 years	190	45.5
Sex		
Female	135	32.3
Male	283	67.7
Marital status		
Divorced / widower	1	0.2
Married / cohabiting	51	12.2
Single	366	87.6
University		
Busitema University	76	18.2
Gulu University	48	11.5
Islamic University in Uganda	54	12.9
Kampala International University	45	10.8
King Caesar University	43	10.3
Makerere University	81	19.4
Mbarara University of Science and Technology	71	17.0
Year of study		
III	107	25.6
IV	148	35.4
V	163	39.0
Nationality		
International	31	7.4
Ugandan	387	92.6
Region of origin if Ugandan		
Central	114	29.5
Eastern	103	26.7
Northern	52	13.5
Western	117	30.3
Type of sponsorship in the current degree		
Government loan scheme	24	5.7
Government merit	151	36.1
Private - NGO	31	7.4
Private - parents	136	32.5
Private - self	76	18.2
Family member is a doctor		
No	267	63.9
Yes	151	36.1
Family members' specialty (n = 151)		
General medicine	68	45.0
Internal medicine	22	14.6
Surgery	22	14.6
Not sure	17	11.3
Paediatrics	15	9.9
Obstetrics and gynaecology	14	9.3

(*Continued*)

Table 1 (Continued).

Variable	Frequency	Percent
Other specialty	14	9.3
Radiology	9	6.0
Ophthalmology	4	2.6
Anaesthesia	3	2.0
Otolaryngology	2	1.3
Emergency medicine	1	0.7

Table 2 Career Preference Among the Participants

Variables	Frequency	Percent
Plans to pursue postgraduate training		
No	18	4.3
Yes	400	95.7
Preferred place to pursue postgraduate training		
Anywhere	171	43.0
Abroad	134	33.7
Uganda	93	23.4
Top 3 specialty preference currently		
Internal medicine	220	52.6
Surgery	214	51.2
Obstetrics and gynaecology	213	51.0
Paediatrics	149	35.6
Public health	86	20.6
Emergency medicine	70	16.7
Ophthalmology	37	8.9
Oncology	37	8.9
Pathology	35	8.4
Others	6	1.4
Anaesthesia	27	6.5
Forensic medicine	25	6.0
Otolaryngology	19	4.5
Radiology	19	4.5
Psychiatry	20	4.8
Anatomy	12	2.9
Pharmacology	7	1.7
Microbiology	6	1.4
Physiology	5	1.2
Palliative care	3	0.7
Biochemistry	2	0.5
Family medicine	1	0.2
Preferred field of practice		
Public service	219	52.4
Private service	153	36.6
Research	111	26.6
Academia teaching	105	25.1
Administration	63	15.1

Table 3 Distribution of Interests to Pursue Internal Medicine Across Students' Demographics, Motivation, and Practice Preference

Variable	Yes (n = 186) Frequency (%)	No (n = 232) Frequency (%)	*P*-value
Age, years	24 (23–26)	24 (23–26)	0.243
18–35	107 (57.5)	121 (52.2)	0.273
>36	79 (42.5)	111 (47.8)	
Sex			
Female	55 (29.6)	80 (34.5)	0.286
Male	131 (70.4)	152 (65.5)	
Marital status			
Divorced / widower	0 (0)	1 (0.4)	0.200
Married / cohabiting	18 (9.7)	33 (14.2)	
Single	168 (90.3)	198 (85.3)	
University			
Busitema University	36 (19.4)	40 (17.2)	0.259
Gulu University	20 (10.8)	28 (12.1)	
Islamic University in Uganda	24 (12.9)	30 (12.9)	
Kampala International University	19 (10.2)	26 (11.2)	
King Caesar University	24 (12.9)	19 (8.2)	
Makerere University	40 (21.5)	41 (17.7)	
Mbarara University of Science and Technology	23 (12.4)	48 (20.7)	
Year of study			
III	57 (30.6)	50 (21.6)	0.106
IV	61 (32.8)	87 (37.5)	
V	68 (36.6)	95 (40.9)	
Nationality			
International	15 (8.1)	16 (6.9)	0.651
Ugandan	171 (91.9)	216 (93.1)	
Region of origin if Ugandan			
Central	48 (25.8)	66 (28.4)	0.680
Eastern	48 (25.8)	55 (23.7)	
Northern	20 (10.8)	32 (13.8)	
Western	55 (29.6)	62 (26.7)	
Type of sponsorship in the current degree			
Government loan scheme	12 (6.5)	12 (5.2)	0.964
Government merit	67 (36)	84 (36.2)	
Private - NGO	15 (8.1)	16 (6.9)	
Private - parents	59 (31.7)	77 (33.2)	
Private - self	33 (17.7)	43 (18.5)	
Family member is a doctor			
No	123 (66.1)	144 (62.1)	0.390
Yes	63 (33.9)	88 (37.9)	
Family members' specialty			
Internal medicine	174 (93.5)	222 (95.7)	0.330
Other	12 (6.5)	10 (4.3)	

(*Continued*)

Table 3 (Continued).

Variable	Yes (n = 186) Frequency (%)	No (n = 232) Frequency (%)	*P*-value
Reason for pursuing MBChB			
Persuaded by family and relatives	16 (8.6)	25 (10.8)	0.458
To make more money	19 (10.2)	23 (9.9)	0.919
Grades dictated admission	20 (10.8)	25 (10.8)	0.944
To make my parents proud	26 (14)	33 (14.2)	0.943
Passion to become a doctor	151 (81.2)	170 (73.3)	0.057
Preferred field of practice			
Public service	100 (53.8)	119 (51.3)	0.615
Private service	62 (33.3)	91 (39.2)	0.214
Research	53 (28.5)	58 (25)	0.421
Academia teaching	56 (30.1)	49 (21.1)	0.035
Administration	22 (11.8)	41 (17.7)	0.097
Interest in research			
No	17 (9.1)	50 (21.6)	0.001
Yes	169 (90.9)	182 (78.4)	

At multivariable logistic regression (Table 4), students with interest in research were 2.5-fold more likely to pursue a career in internal medicine (adjusted odds ratio: 2.5, 95% CI: 1.4–4.6, p = 0.003).

Attitudes Towards Internal Medicine

Table 5 shows the attitudes of the participants towards internal medicine. Majority of the students strongly agreed that internal medicine requires wide reading (n=303,72.5%) and patient problems in internal medicine are so diverse (n = 212, 50.7%). About half of the participants agreed that there is an excellent opportunity for inpatient (n = 213, 51.0%) and outpatient care (n = 196, 46.9%) in internal medicine. More students agreed that the call schedule in internal medicine

Table 4 Factors Associated with Interest in Internal Medicine

Variables	Adjusted Odds Ratio (95% CI)	*P*-value
Age	0.9 (0.9–1)	0.105
Sex		
Female	1.0	
Male	1.1 (0.7–1.8)	0.548
Year of study		
I	1.0	
IV	0.7 (0.4–1.1)	0.134
V	0.8 (0.5–1.3)	0.379
Motivation to pursue MBChB		
Passion	1.5 (0.9–2.5)	0.092
Practice preference		
Academia/teaching	1.5 (0.9–2.3)	0.108
Administration	0.6 (0.3–1)	0.069
Interests in research	2.5 (1.4–4.6)	0.003

Table 5 Attitudes of the Participants Towards Internal Medicine

Attitude	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean (SD)
Internal medicine requires wide reading	3 (0.7)	4 (1.0)	25 (6.0)	83 (19.9)	303 (72.5)	4.6 (0.7)
Patient problems in internal medicine are so diverse	0 (0)	13 (3.1)	36 (8.6)	157 (37.6)	212 (50.7)	4.4 (0.8)
Internal medicine makes you a good researcher	5 (1.2)	18 (4.3)	81 (19.4)	159 (38)	155 (37.1)	4.1 (0.9)
Internal medicine will allow me to have academic / teaching role	12 (2.9)	12 (2.9)	75 (17.9)	173 (41.4)	146 (34.9)	4 (0.9)
I admire physicians	16 (3.8)	39 (9.3)	90 (21.5)	147 (35.2)	126 (30.1)	3.8 (1.1)
There is an excellent opportunity for inpatient care in internal medicine	10 (2.4)	26 (6.2)	98 (23.4)	213 (51)	71 (17)	3.7 (0.9)
Patients die often in internal medicine	12 (2.9)	46 (11)	109 (26.1)	127 (30.4)	124 (29.7)	3.7 (1.1)
There are good opportunities to work as a physician abroad	7 (1.7)	21 (5)	158 (37.8)	141 (33.7)	91 (21.8)	3.7 (0.9)
There is an excellent opportunity for outpatient care in internal medicine	8 (1.9)	34 (8.1)	111 (26.6)	196 (46.9)	69 (16.5)	3.7 (0.9)
There are many future job opportunities to a physician in Uganda	12 (2.9)	43 (10.3)	143 (34.2)	141 (33.7)	79 (18.9)	3.6 (1)
Joining Internal medicine requires a very high cumulative grade point average	5 (1.2)	38 (9.1)	166 (39.7)	143 (34.2)	66 (15.8)	3.5 (0.9)
Internal medicine will allow me to have time for my family and spouse	21 (5)	52 (12.4)	133 (31.8)	131 (31.3)	81 (19.4)	3.5 (1.1)
There are less procedures in internal medicine	19 (4.5)	88 (21.1)	75 (17.9)	153 (36.6)	83 (19.9)	3.5 (1.2)
Call schedule in internal medicine is flexible	17 (4.1)	54 (12.9)	126 (30.1)	180 (43.1)	41 (9.8)	3.4 (1)
Support network in internal medicine is excellent	11 (2.6)	47 (11.2)	169 (40.4)	143 (34.2)	48 (11.5)	3.4 (0.9)
Internal medicine training facilities are of excellent quality	11 (2.6)	76 (18.2)	149 (35.6)	128 (30.6)	54 (12.9)	3.3 (1)
The quality of current internal medicine trainees has encouraged me to pursue a career in internal medicine	21 (5)	87 (20.8)	149 (35.6)	112 (26.8)	49 (11.7)	3.2 (1.1)

was flexible (n = 180, 43.1%), and that internal medicine would allow one to have academic/teaching roles (n = 173, 41.4%).

The mean attitude scores are presented in Table 5. The mean attitude scores were highest for internal medicine requiring a lot of time (4.6 ± 0.7), patients' problems being diverse (4.4 ± 0.8), making one a good researcher (4.1 ± 0.9), and allowing one to have academic/teaching career (4.0 ± 0.9), indicating overall agreement with the statements. The mean attitude scores were lowest for internal medicine having low patient load (2.2 ± 1.0), being boring to practice (2.3 ± 1.1), physicians having a lot of free time (2.6 ± 1.0) and having attractive salaries (2.7 ± 0.9), indicating overall disagreement.

Motivation to Undertake Research

Most of the students (84.0%) were interested in research (Table 6). Among these, the desire to discover new things (74.1%), passion (31.6%), mentorship (31.6%), income (29.1%), and need for collaborations (29.1%) were the top five reasons for interests in research. Among the 67 students not interested in research, long time required, hectic research processes, and the need for wide reading were the most frequent reasons.

Table 6 Interests in Undertaking Research Among the Study Participants

Variable	Frequency	Percent
Interested in research		
Yes	351	84.0
No	67	16.0
Reason for interest		
Discovering new things	260	74.1
Passion	111	31.6
Mentorship	111	31.6
Money	102	29.1
Collaborations	102	29.1
Academic promotion	100	28.5
Awards and recognition	90	25.6
Travel	67	19.1
Others	10	2.8
Reason for lack of interest		
Research requires a lot of time	32	47.8
Research is hectic	31	46.3
It requires a lot of reading	16	23.9
I am not good at writing	15	22.4
I lack mentors	14	20.9
Research requires a lot of money	11	16.4
Publishing is a hard process	10	14.9
Others	5	7.5

Discussion

We aimed to explore interest and factors associated with medical students' career choices regarding internal medicine in Uganda. Majority of study participants strongly agreed that internal medicine is diverse and requires wide reading. Overall, 186 (44.5%) participants reported plans to pursue a Master of Medicine degree in internal medicine and this was significantly associated with interest in research. Majority of the participants had interest in pursuing a career in research. Our findings reflect a positive response to the growing demand for research due to the increasing burden of both communicable and non-communicable diseases, emerging and re-emerging diseases and pandemics. Puertas et al argue that limited research opportunities[10] affect students' choice of graduate training. Understanding features of medical students that favors the choice of internal medicine would guide development of interventions to recruit more students in postgraduate training and a career in internal medicine.

Almost all students expressed interest in postgraduate training, although only about a quarter were interested in training from Uganda. The interest in postgraduate training is similar to findings from a study among Nigerian medical students.[11] It would be interesting to explore reasons for lack of interest in training in the country, but a possible reason is the desire for higher income as demonstrated in one study among Malawian medical students.[12] A multisite study conducted in selected medical schools in Uganda found that 44.65% of final year medical students were interested in leaving Uganda after their graduation.[13] Eastwood et al[14] report that the lack of opportunities for post-graduate training is one of the major factors for the migration of health workers to foreign countries. There is a need to increase collaborative relationships between foreign and local institutions for training healthcare workers in sub-Saharan Africa.

Our findings contrast with a recent study conducted among 5th year medical students of Makerere University which showed that only 12.6% of the students surveyed selected internal medicine as their preferred career choice[15] and a 2006 career intentions study among medical students from 6 sub-Saharan countries which found the top most desired

specialities to include surgery (20%), internal medicine (16.7%), and paediatrics (9%).[16] We found that the top three most preferred specialties were internal medicine (52.6%), surgery (51.2%), and obstetrics and gynaecology (51.0%). These disciplines have been reported as preferences by medical students in several other studies with surgery usually ranking first in order of choice.[17–19] The training curriculum provides more exposure to these four major disciplines. In addition, many teaching hospitals in Uganda like other low-resource countries have low capacity, hence limited exposure for students to other disciplines.

The choice of internal medicine was significantly associated with preference for academia and research. This was contrary to a US study, which found educational experiences, the nature of patient care in internal medicine, and lifestyle as associated factors.[9] According to a systematic review by Lei and Chuang, both academic and non-academic factors determine graduate studies selection.[20] Academic factors include institutional, departmental, and faculty factors, whereas non-academic factors include factors related to personal reasons and the impact of other people. Other factors influencing career choice include undergraduate medical course performance, positive experience during a discipline's clerkship.[15,21] Influences from media for example watching medical series such as the "House" series has also inspired some students to pick interest in internal medicine. Besides, several barriers exist towards medical student's preference for postgraduate training. Students with a preconception of the low financial status of specialists of a given discipline, unfavorable lifestyles of a career, and inadequate exposure to a specialty in clinical rotations are key barriers to choosing a medical postgraduate career path.[15]

Medical students require career guidance from their academic medical centers. Interventions such as Internal Medicine Interest groups can help foster strong relationships with significant outcomes for proper mentorship of medical students interested in pursuing a residency program in internal medicine.[22] The Association of Physicians of Uganda could take on this role. The public service was the most desired field of practice by more than half of the participants. This could be due to anticipation of Government of Uganda training scholarship opportunities. This finding is consistent with that of Bailey et al[12] who found Malawian medical students desired to work for the government for reasons such as availability of training opportunities for public service workers. Also, job security in public service is perceived to be more stable than in private service. It also offers one an opportunity to receive a gratuity and pension at the end of the service, which is unlikely in private practice in Uganda.

This study has some limitations. It was conducted in 7 medical schools, with a vast experience of teaching systems and learning environments therefore provides generalizable findings among medical students across Uganda. However, consecutive sampling and the online data collection could have introduced selection and information bias among participants.

Conclusions

Majority of medical students in Uganda are interested in specializing after their undergraduate medical degree. A significant proportion of medical students are interested in pursuing internal medicine motivated by interest in research and joining academia. The findings provide some insight into how the undergraduate curriculum and internal medicine clinical exposure in particular can be leveraged to interest students to enroll for specialist training and a career in internal medicine.

Abbreviations

ACP, American College of Physicians; MBChB, Bachelor of Medicine and Bachelor of Surgery; NGO, Non-Governmental Organisation; Mak, Makerere University; MUST, Mbarara University of Science and Technology; GU, Gulu University; BU, Busitema University; KIU, Kampala International University; IUIU, Islamic University in Uganda (IUIU); KCU, King Caesar International University.

Data Sharing Statement

Data are available upon reasonable request from the first author at drbongomin@gmail.com.

Ethics Approval and Consent to Participate

The study was conducted in accordance with the principles of the *Declaration of Helsinki*. Approval to conduct the study was sought from the Makerere University School of Medicine Research and Ethics Committee (Mak-SOMREC-2021-161). Prior to enrollment, written informed consent was obtained from all study participants.

Consent for Publication

All study participants provided written informed consent for their data to be published in a peer-reviewed journal.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors declare that they have no conflicts of interest in relation to this work.

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