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Face Mask use Against Covid-19 among Medical Students at Kampala International University Teaching Hospital Ishaka Town Bushenyi District, Uganda

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ABSTRACT

Corona virus disease 2019 (COVID-19) is an acute-respiratory infectious disease caused by the Severe Acute Respiratory Syndrome Corona virus 2 (SARS-CoV-2), that spreads mainly through respiratory droplets and secretions. The disease was first reported in Wuhan, Hubei Province of China in December 2019. COVID-19 transmission can occur directly via contact with infected individuals or indirectly via contact with surfaces in their immediate environment or objects used on or by those infected. In specific circumstances and settings particularly where procedures that generate aerosols are performed, airborne transmission of COVID-19 could be possible. The spread of COVID-19 via aerosols even in the absence of aerosol generating procedures could also be possible. To date, no clear treatment options have been reported for the virus and as such, treatments have been limited to the use of anti- HIV drugs and/or other anti-virals such as Galidesivir and Remdesivir. A cross sectional-descriptive study was used to determine the prevalence of face mask use, attitude and knowledge of face mask use against COVID19 amongst medical students of Kampala international university. The sample size was estimated using the Kish Leslie formula for cross-sectional studies. The result of this study indicates that, out of 423 respondents, 379 (98.9%) used facemasks, majority of the students 261 (61.7%) wore facemasks because their teachers wore facemasks and 246(58.2%) reported that facemasks were uncomfortable. Almost half of the respondents, 205 (49.0%) thought that they were not vulnerable to COVID despite not using the facemasks and 386(91.2%) knew that the appropriate size of the mask was important against COVID 19. The prevalence of facemasks was high amongst medical students. Majority had poor attitude towards facemask use, though with a good knowledge base of face mask use.

Keywords: Face Mask, Covid-19 and Medical Students

INTRODUCTION

Corona virus disease 2019 (COVID-19) is an acute-respiratory infectious disease caused by the Severe Acute Respiratory Syndrome Corona virus 2 (SARS-CoV-2), that spreads mainly through respiratory droplets and secretions. The disease was first reported in Wuhan, Hubei Province of China in December 2019. COVID-19 transmission can occur directly via contact with infected individuals or indirectly via contact with surfaces in their immediate environment or objects used on or by those infected. In specific circumstances and settings particularly where procedures that generate aerosols are performed, airborne transmission of COVID-19 could be possible. The spread of COVID-19 via aerosols even in the absence of aerosol generating procedures could also be possible. To date, no clear treatment options have been reported for the virus and as such, treatments have been limited to the use of anti-HIV drugs and/or other anti-virals such as Galidesivir and Remdesivir [1].

To contain viral spread, several countries continue to utilize non-pharmaceutical public health interventions, including among others: (1) boarder control or closure, (2) partial- or complete- lockdown, (3) quarantine and testing of incoming travelers and returnees, and (4) mass testing for rapid case detection, contact tracing and quarantine.

Additional measures, community mitigation strategies including among others: (1) mass media-based sensitization, (2) appealing to the masses to: unceasingly carry out good hygiene practices particularly hand washing, maintain appropriate social distance, stop all mass gatherings, cease all socioeconomic activities except essential services like security, food markets, health-care and wear face-masks also continue to be emphasized [2].These measures have been implemented at different time points and to various degrees in different geographical areas to reduce the risk of community transmission of COVID-19. Noteworthy, several of these measures had been used previously for the control of community transmission of the: (1) Severe Acute Respiratory Syndrome (SARS) in 2003, (2) pandemic Influenza A H1N1 in 2009, Ebola Viral Hemorrhagic Fever in West Africa in 2014, as well as several viral hemorrhagic fever outbreaks over the years in Uganda. Wearing of face-masks in public settings where social distancing measures are difficult to maintain, has been documented as one of the most critical prevention measure that can limit the acquisition and spread of COVID-19 by the World Health Organization (WHO) and the United States Centers for Disease Control (CDC). In light of this, WHO and CDC have developed guidelines for the use of the same in these settings [3]. Previously published studies have shown that wearing of face-masks to control infectious diseases spread has several advantages that include among others: (1) a simple operation, (2) a strong sustainability, (3) high health benefits, and (4) g good h health e economic b benefits. Other previously published studies have also shown that use of face-masks by the general public is of potentially high value in limiting community transmission of infectious diseases. Likewise, the use of face-masks has also been documented to curb viral transmission by asymptomatic individuals and thus limiting the epidemic's growth rate. With regards to limiting community spread of COVID-19, community-wide use of face-masks has been encouraged. Face-masks have also been suggested to serve as visible cues of an otherwise yet widely prevalent pathogen, SARS-CoV-2, and as tools that could be utilized to remind people of the importance of the other infection-control measures such as social distancing. Face-masks have also been documented to be symbolic, beyond them being tools; they have been described as talismans that could increase health-care workers' perceived sense of safety, well-being, and trust in their health-care settings [4].Face masks and respirators were considered an effective method of preventing respiratory infections. Most participants described face masks/respirators as the "only" and the "best protection" method available to protect healthcare workers (HCWs) from respiratory infections [5]. Preventing health professionals from infectious diseases/respiratory infections is crucial to promote the health and safety of staff and to maintain the performance and capability of the health workforce during outbreaks of emerging infections, such as pandemic COVID-19, influenza, Middle East Respiratory Syndrome Corona virus (MERS-CoV), and Ebolavirus [6]. In the context of the COVID-19 pandemic, healthcare workers (HCWs) protection from contamination is based on the wearing of personal protective equipment (PPE). Transmission routes of SARS-Cov-2 include direct transmission (droplet, eg cough, sneeze) and contact transmission (contact with oral, nasal, and eye mucous membranes). The existence of corona virus (SARS-CoV-2) in the environment of patients with COVID-19 reinforces the belief that fomites play a role in the transmission of the virus; however, the relative significance of this route of transmission relative to direct exposure to respiratory droplets is still obscure [7].In developing countries, where the occurrence of communicable disease is high and the hospital environmental conditions are often poor, hospitals may rely mostly on PPE to protect their staffs. Face masks use (including medical and cloth masks) and respirators are strongly recommended by the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC) as a standard for transmission-based safety measures [8].Healthcare workers are crucial to any healthcare system. During the ongoing COVID-19 pandemic, healthcare workers are at a substantially increased risk of becoming infected with severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) and could come to considerable harm as a result. Healthcare professionals are at greater risk of contracting COVID-19 because of the nature of their job. They could be exposed to atypical patients, infected family members, contacts, and colleagues, or live in communities of active transmission, as this type of work is very difficult to maintain social distancing. Due to this reason proper face mask as recommended by WHO guidelines is needed for safe work force re-entry for people with elevated individual and occupational risk from COVID-19 [9]. This study was therefore conducted to determine, the, prevalence, attitude and knowledge towards facemasks use against covid-19 among medical students at KIU-TH.

METHODOLOGY

Study Design

This was a hospital based cross sectional descriptive study to describe the prevalence, attitude, and knowledge towards to the facemask use against COVID19 amongst medical students at KIU-TH.

Study site

The study was conducted from Kampala international university teaching hospital located in Ishaka Bushenyi Municipality Western region Uganda. It's privately owned and operates a teaching hospital- KIU- teaching hospital (KIU-TH). It is located along Mbarara - Kasese highway, 48km from Mbarara town on a sloppy hill at the range of 800 to 1200m height above sea level. Its vegetation is of wet savannah grassland. Bushenyi district is about 360 km from Kampala city. It is bordered by Mitooma and Ntungamo districts in the south, Sheema in the east, Buwheju in the north and Rubirizi in the west. The researcher chose this because of its easy accessibility to collect data from respondents.

Study Population

Source population: All medical students who were studying at KIU-TH were the source population.

Inclusion criteria and Exclusion Criteria

All medical students who were studying at KIU-TH during the data collection period were the study population. **Exclusion criteria**; medical students who refused to consent were excluded from the study.

Sampling Size Determination

The sample size was estimated using the Kish Leslie formula for cross-sectional studies. A prevalence (p) of face mask use in Uganda was taken to be 50% owing to the fact that there were limited studies conducted on facemask use. A 95% level of confidence, anerrorrate (e) of 0.05 and a Z score of 1.96 corresponding to the two 95% confidence interval (CI) and a 10% non-response were used in the calculation. This yielded a sample size of 423. $\mathbf{n= z^2P(1-P)/ e^2}$

n=estimated minimum sample size required p=proportion of a characteristic in a population (50%). e= the acceptable margin of error at 0.05 (5%)
z= confidence interval of 1.96 (95%)

Sampling technique

Consecutive enrollment of study participants until the sample size was attained

Data collection tool and method

The questionnaire was developed by reviewing previous different literature on the proper use of surgical face mask and the guidelines of the Centre for Health Protection WHO and the CDC and in consultation with experts from different fields to check the relevance and make necessary changes according to the study requirements. [10]. The questions were modified according to the suggestions received from the expert panel and output from the pre-test. Guidelines for layout, question design, formatting, and pretesting testing was followed. The self-administered questionnaire developed by the investigators contained the following 4 sections: basic demographic characteristics (age, gender), and knowledge, attitude, and prevalence regarding the use of proper face mask utilization. The data was collected through a self-administered method by two trained data collectors.

Data quality control

The quality of data was ensured by doing the questionnaire pre-tested on 5% of the total sample size at KIU-TH that was assumed to have similar characteristics to the targeted population. Based on their feedback the necessary amendment was done and the questionnaire was assessed for its clarity; the completeness and evaluate the validity and content of the questionnaire and modified accordingly. Close supervision was also made during the data collection and appropriate feedback was provided. Also a preliminary phase was conducted to assess the validity and reliability of the questionnaire before its use. Initially, three experts in the field of epidemiology and research in KIUTH was asked to assess the degree to which items in the questionnaires are relevant and can correctly measure knowledge, attitude, and prevalence of proper face mask use in case of COVID-19 and then correction was made accordingly. Pretesting of the questionnaire was done on 10 participants who were excluded later from the study sample. The data from the pre-test was used to assess internal consistency and reliability using Cronbach's alpha.

Data analysis

Data was entered in Microsoft excel it was coded and cleaned, then imported to SPSS version 23 computer software package for analysis. Analysis was by descriptive statistics and as per objectives;

i. Data was collected and analyzed and presented inform of bar graph, pie-chart and a table for objective 1
ii. Data was collected and analyzed and presented inform of bar graph and pie-chart for objective 2.
iii. Data was collected and analyzed and presented inform of bar graph and pie-charts and table for objective 3.

Limitations of the study

I only used medical students however I recommend that in future students from other faculties should be included.The researcher had limited funds. However, she mobilized funds from relatives and well-wishers. The high cost of stationary and internet access although the researcher looked for a cheaper place and also did typing and coding the work by myself to minimize the costs of many research assistants.

Ethical Considerations

Ethical approval was obtained from the Institutional Review Board of KIUTH, which was confirmed to the principles embodied in the Declaration of Helsinki. Official permission was obtained from the Director before approaching the study participants. The objective and purpose of the study was clearly explained to the study subjects to obtain written informed consent before data collection. Participants were informed that they could discontinue or decline to participate in the study at any time. Confidentiality of the information was maintained and the data was recorded anonymously throughout the study.

PRESENTATION AND INTERPRETATION OF RESULTS.

Socio-demographics of the respondents

Social demographic characteristics of medical students at Kampala International University.

Majority of the respondents, 300 (70.9%) were in the age group 18-29 years old, 234 (55.3%) were male. More than 1/3, 157 (37.2%) were Anglicans. More than half, 274/423 (64.8%) of the participants had BMS and 218 (51.5%) were in year 2 (Table1).

Table1: Socio-demographic characteristics of the students' medical students at KIU-TH

Variable	Frequency	Percentage (%)
Age 18-29	300	70.9
30-39	106	25.1
40 -49	5	1.2
50 & above	12	2.8
Sex Male	234	55.3
Female	189	44.7
Course DMLT	149	35.2
BMS	274	64.8
Year Year 1	59	14.0
Year 2	218	51.5
Year 3	135	31.9
Year 4	11	2.6
Religion Anglican	157	37.2
Catholic	92	21.8
Moslem	86	20.3
Pentecostal	71	16.8
Seventh Day Adventist	12	2.8
Others	5	1.1

Prevalence of face-mask use among medical students at KIU-TH

Majority of the respondents, 379 (89.6%) owned a face mask while the minority, 44 did not.

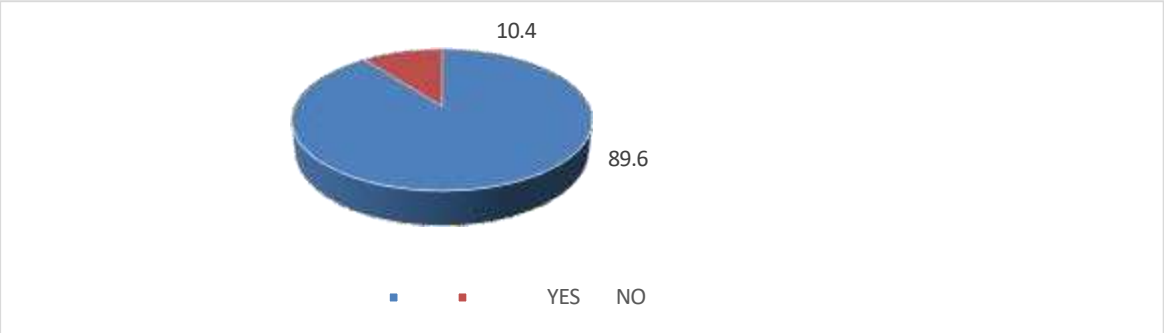

Figure 1: Students who owned facemask.

Attitudes towards Face-mask use and COVID-19 among medical students at KIU-TH.

If face masks are uncomfortable

Majority of the respondents, 246/423 (58.2%) agreed that face masks are uncomfortable while 177 (41.8%) were in disagreement.

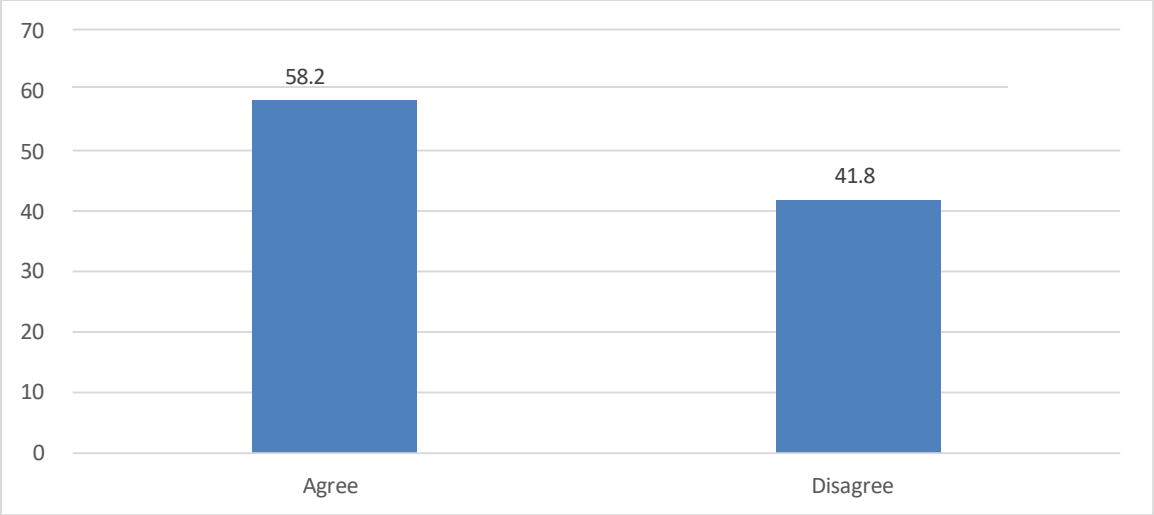

Figure 2: Students who owned facemask

Whether students confidently wore masks correctly

A 1/3 of the respondents, 143/379 (37.7%) did not wear the face masks correctly at the time of the interview while (62.3%) confidently wore their masks correctly.

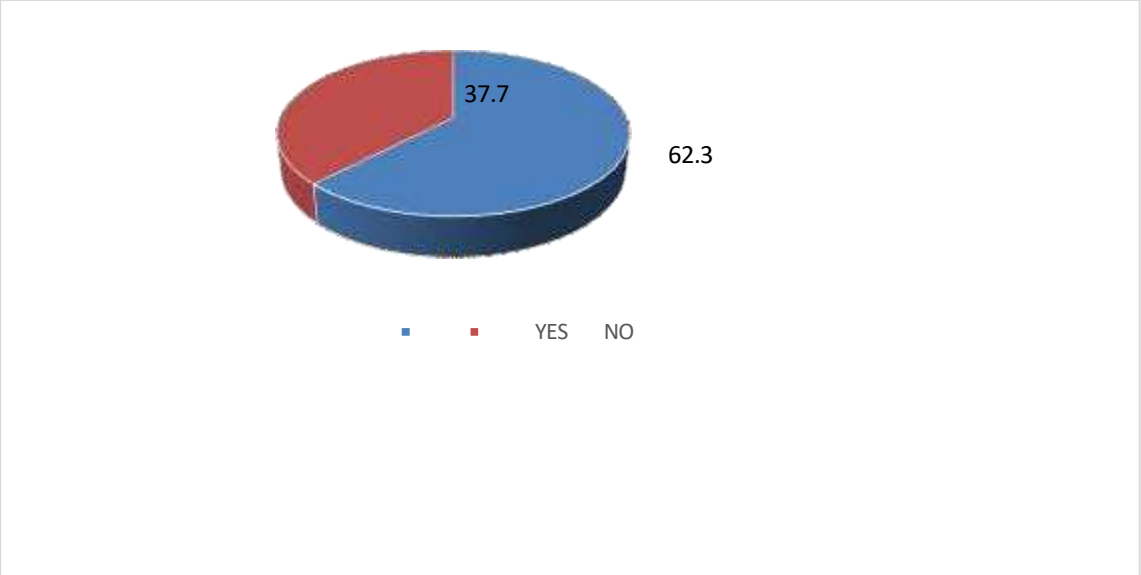

Figure 3: Whether students confidently wore masks correctly

<u>Regular wearing of the masks</u>

Most of respondents (97.1%) wore masks daily and regularly unlike (2.9%) did not wear their masks daily

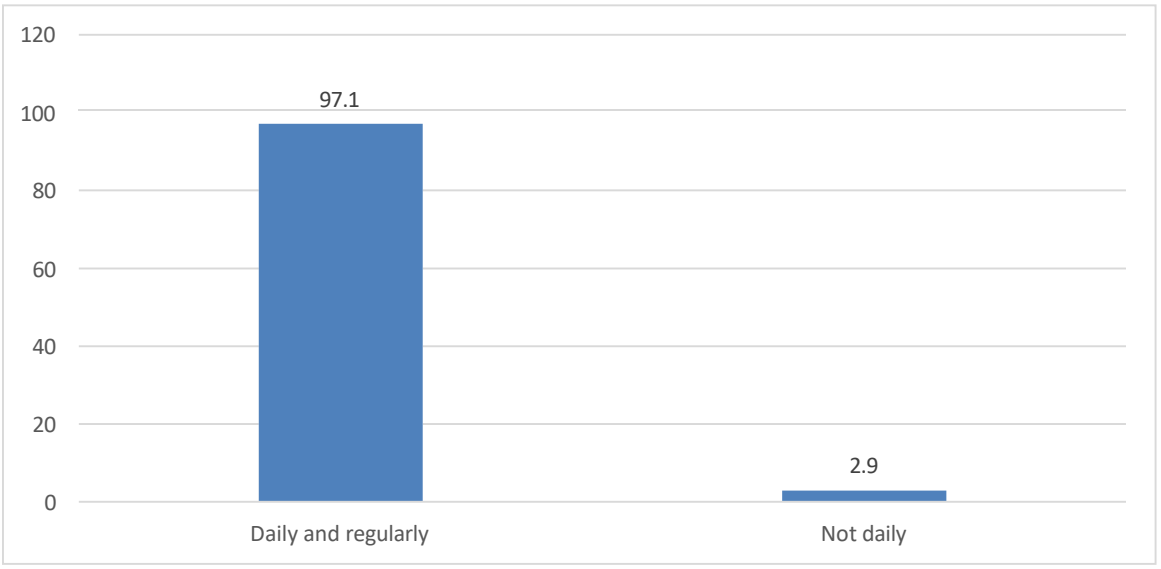

Fig 4: Whether respondents wear masks regularly.

Students wear masks because they are vulnerable to COVID-19.

Half; 205(48.5%) of the participants disagreed while 195(46.1%) agreed that were vulnerable to COVID-19 disease.

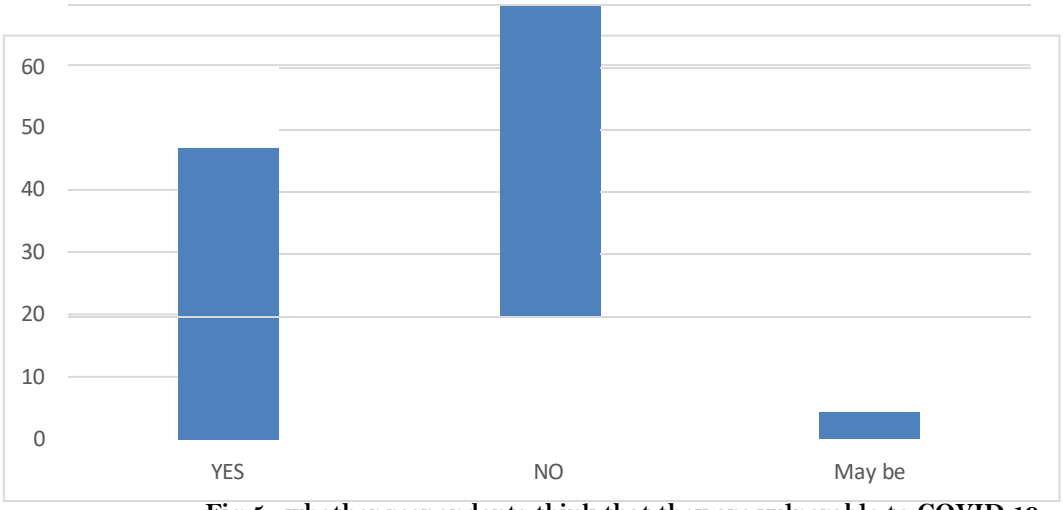

Fig.5 : whether respondents think that they are vulnerable to COVID 19

If appropriate size is of importance.

Majority, 386 (91.2%) of the participants agreed that appropriate size mask is important.

Figure 6: If the appropriate size of mask is important

If the mask should cover the nose, mouth and chin.

The majority, 399 (94.3%) were in agreement with a very few in disagreement.

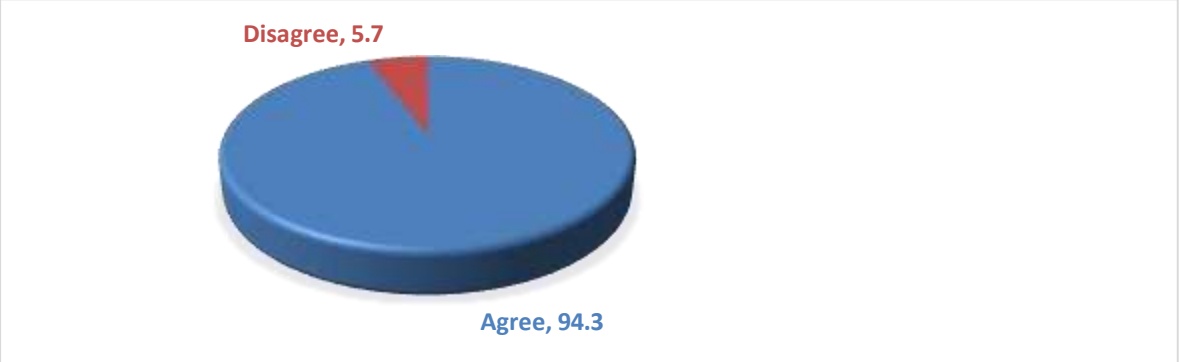

Figure 7: if a mask should cover the nose, mouth and chin.

Wash and iron facemasks.

Majority, 406(96.0%) believed that it's important to wash and iron a reusable mask

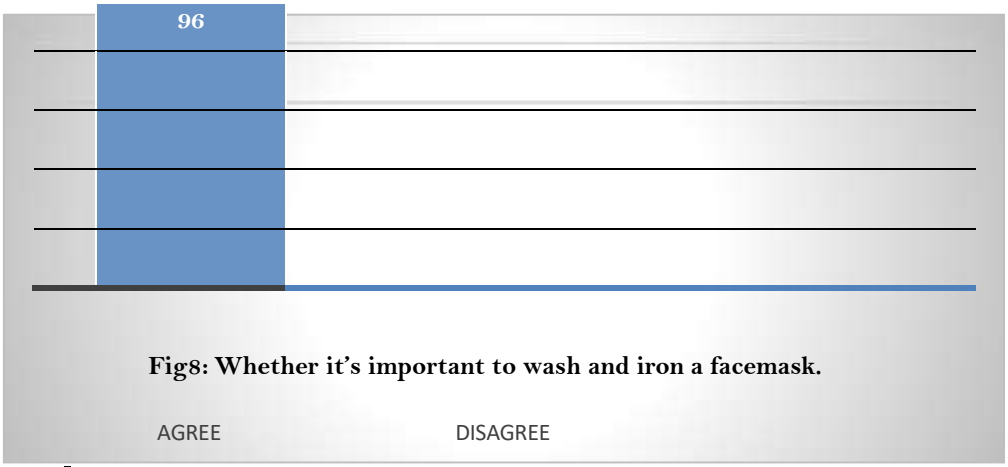

Fig8: Whether it's important to wash and iron a facemask.

Reason for wearing facemasks:

Majority, 375/379 (98.9%) of the study participants only wore face masks due to fear of missing classes and 4/379 (1.1%) wore them due to fear of COVID-19.

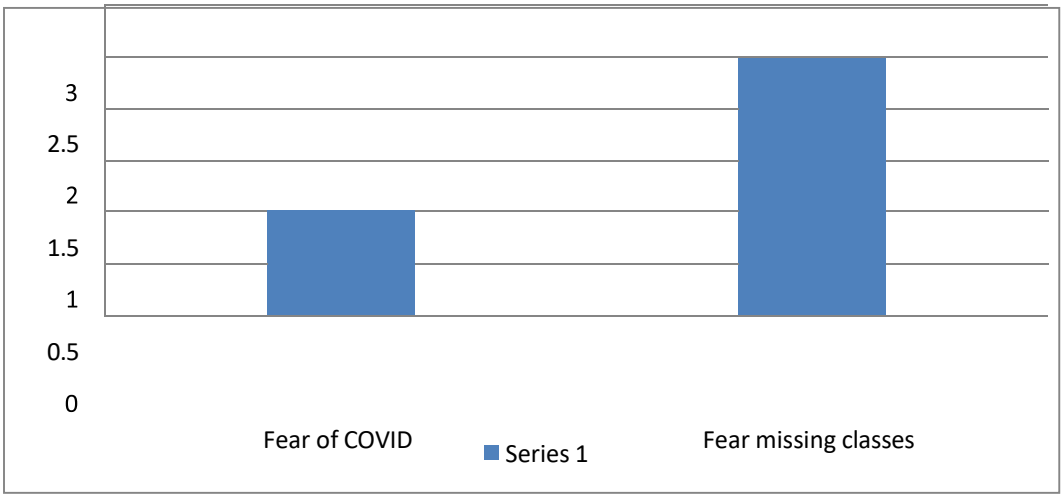

Fig 9: Reasons why students put on face masks.

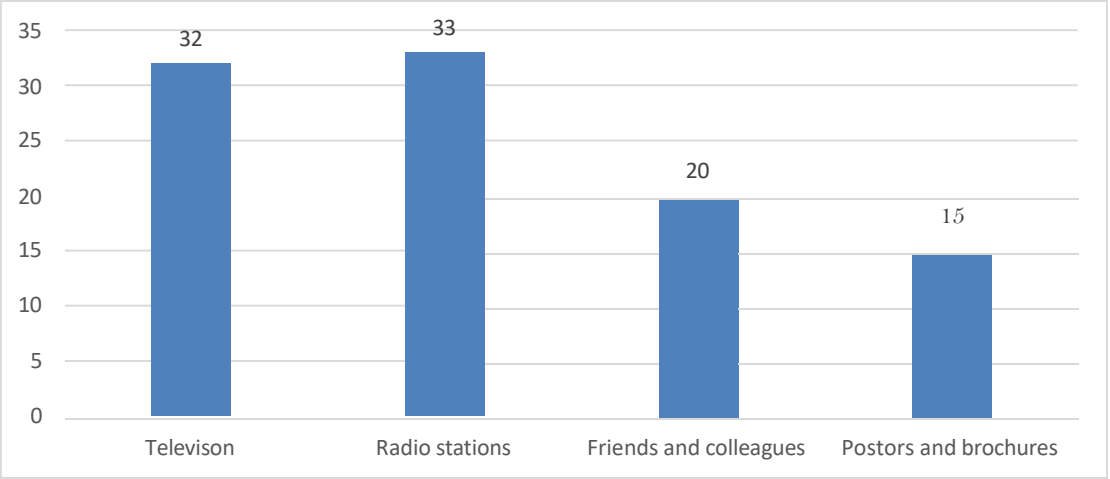

Fig10: Sources of knowledge about covid19

The primary source of information about COVID-19; students (33%) knew about the pandemic and facemask use from radio, TV was the second source of information (32%), followed by (20%) knew from friends and colleagues. Also, (15%) mentioned that the source of information about COVID-19 was posters/brochures Radio was the only source of information about COVID-19, which points to the importance of social media as an essential source of information in the COVID-19 pandemic.

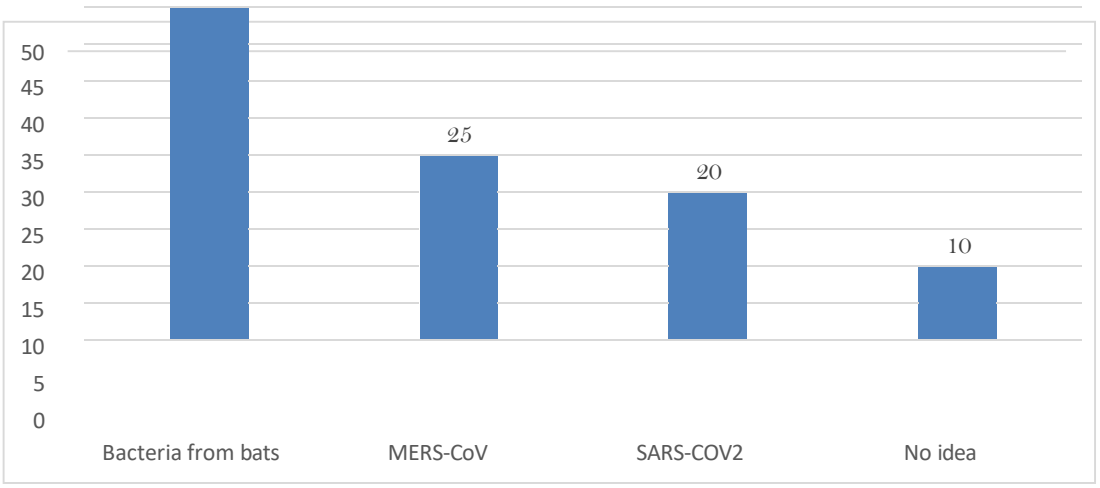

Fig 11: Causes of Corona virus disease COVID-19

On the causes of corona virus disease covid19, participants showed that bacteria from bats were the major causes of corona virus disease covid19, followed by (25%) who cited on MERS-CoV, (20%) cited on SARS-COV2 unlike (10%) had no idea on the causes of corona virus disease covid19. The findings implied that majority of respondents had knowledge about covid19 corona virus disease.

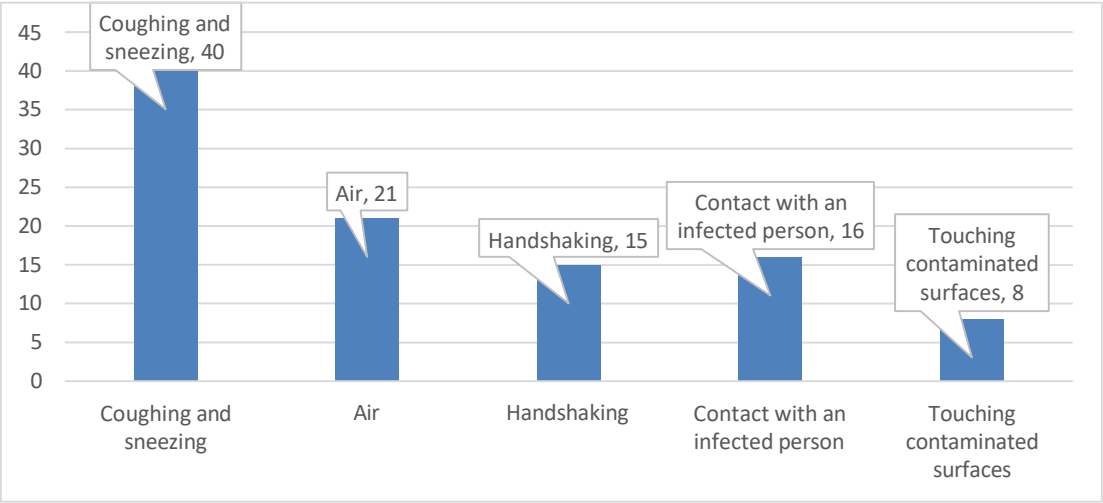

Fig 12: Transmission of Corona virus disease (COVID-19)

40% of respondents showed that corona virus disease is transmitted through coughing and sneezing, (21%) cited on air, (16%) revealed that it is transmitted through contact with an infected person. Also, in an interview with some key informants, the virus can spread from an infected person's mouth or nose in small liquid particles when they cough, sneeze, speak, sing or breathe. These particles range from larger respiratory droplets to smaller aerosols

Fig 13

DISCUSSION

The prevalence of face mask use against Covid-19 among medical students at Kampala International University Teaching Hospital Ishaka Town Bushenyi District, Uganda.

Despite the reported increase in the clusters of infections in Uganda's education institutions which later led to closures, there is limited literature on face mask use amongst students. This study aimed at assessing face mask use medical students at KIU-TH during the COVID- 19pandemic showed that more than a third of the respondents were not correctly wearing face masks at the time of interview. This study revealed that majority, 379 (89.6%) of the respondents wore face masks. Out of these, 236 (62.3%) wore them correctly at the time of interview. These findings don't concur with those in across-sectional study conducted by Barrios and colleagues who revealed that 89.7% of the interviewed students were wearing facemasks correctly [11]. The difference in study findings could be attributed to the level of education of the students and the difference in study settings. Barrios and colleagues conducted their study among university students in the United States who undoubtedly have better access to information and are therefore more knowledgeable about the risk of COVID-19 infection and the importance of wearing face masks un like those in rural eastern Uganda [11].

The attitude towards face mask use against Covid-19 among medical students at Kampala International University Teaching Hospital Ishaka Town Bushenyi District, Uganda.

Furthermore, the study findings could be explained by the low COVID-19 risk perception reported in this study. Close to half (48.5%) of the students in this study believed that they were not vulnerable to COVID-19. These findings imply that there's need for strict enforcement of face mask usage by school administrations, so as to change students' behavior. Furthermore, continuous sensitizations on correct face mask use should be done. The study also revealed that majority of the masks being worn by students were usable cloth masks. The findings are in

agreement with those by [11]. in USA which found that 92.2% of the students wore reusable cloth masks. The findings however differ from those in a study conducted by [12]. in Vietnam which revealed that only 23.1% were using reusable cloth masks. Reusable cloth masks have been recommended for use among the general public, including in schools by the WHO and Uganda's ministry of health [13], which explains the usage levels among students. In addition, the government of Uganda distributed cloth masks to its population as part of the preventive interventions to limit the spread of COVID- 19 [14].Besides, cloth masks are re-useable, durable and hence heaper in the long run for students who might not be able to afford a new mask every other day. However, the discrepancy with results reported by Duong could be due to the perceived high risk for COVID-19 infection since they were experiencing continuous domestic outbreaks in Vietnam at the time [15]. therefore the choice of surgical masks [12]. Given the significant number of students using reusable cloth masks in this study, it's important to emphasize proper storage and cleanliness so as to ensure that the masks are as effective as possible in reducing transmission of COVID-19. It's worth noting that nearly half of the respondents thought they were not vulnerable to COVID- 19. This is quite unfortunate but true and could be attributed to the poor access to information especially in rural areas. Students could also have felt that they were not vulnerable to COVID- 19 since the rural areas where they reside have generally been perceived as safe zones and urban areas as high risk areas. This perception could impact correct face mask usage and uptake of other SOPs. However, our findings don't corroborate those in studies conducted in south Western Ethiopia (53.4%), Ghana (68.3%) and Sierra Leone (75%) [16-18], which indicated higher risk perceptions. Our findings show the need for more efforts toward sensitization of students in rural areas on their risk and susceptibility to COVID-19. At multi variable analysis, students who perceived that they were vulnerable to COVID-19 were more likely to wear face masks correctly. This is not surprising because a high risk perception increases the need to take up prevention measures in an attempt to preserve one's health. These findings corroborate those by Sim and colleagues who reported that individuals are more likely to wear face masks due to the perceived susceptibility and perceived severity of being afflicted with life-threatening diseases [19]. Risk perceptions and health behavior have also been associated in several other studies [20, 21].In light of this, it is important to promote face mask use among other standard operating procedures in order to control the spread of COVID-19. Students in staying in the campus were statistically more likely to wear masks correctly compared with those outside. This can be attributed to the fact that lecturers and staff at KIU could be strictly enforcing COVID-19 measures compared to regular students studying from outside, since students are left under complete care of the University administration. As a result, the University administration might feel more obligated to keep students safe.

The knowledge of face mask use against Covid 19 among medical students at Kampala International University Teaching Hospital Ishaka Town Bushenyi District, Uganda

This study revealed that the majority of the students had good knowledge towards the use of masks that is, they were aware that the appropriate size of the mask is important and that masks should cover the nose, mouth and chin. It was found out that social media was the primary source of information about COVID-like radios and TVs. This finding is consistent with those of other studies that have showed that: televisions, radios, social media and other internet platforms constitute the major sources of information about COVID-19 [22]. In addition, the transition from television and radios to social media and other internet platforms continues at an unprecedented rate in Uganda. Indeed, the use of smart phones continues to increase across the country, internet connectivity is currently progressing from a luxury for the rich to a felt need for the middle class, and internet cafes are still flourishing throughout the capital city Kampala with lower prices. These developments in the country could explain the increasing use of social media and other internet platforms as sources of information on COVID-19 for the population [23]. Respondents who disagreed with the statement that masks were uncomfortable were also more likely to wear them correctly. Face masks are one of the recommended preventive measures in controlling the transmission of COVID-19 and comfort of a face mask is one the factors that determine its appropriate use [24-26].Our study revealed that more than a third did not correctly use face masks. Nearly half of the students did not believe that they were at risk for COVID-19 and this is quite scary as it could influence adherence to face mask use as well as other SOPs. Being inside the campus, perception of vulnerability to COVID-19 and finding masks comfortable were associated with a higher likelihood of wearing face masks correctly. Interventions aimed at increasing knowledge on risk factors for COVID-19, changing perceptions and promoting adherence to SOPs in schools are therefore warranted to ensure safety of students in such populous environments.The shortage of mask supply and wearing discomfort may confuse the association between mask and the risk of anxiety symptoms during the COVID-19 pandemic. Thus, the supply of masks should be guaranteed and we also need to further improve the design for comfort.Students of certain faculties showed a low level of knowledge about transmission routes and procedures for dealing with a person suspected of being infected with SARS-CoV-2 or who has tested positive for COVID-19. Additional educational programs were conducted among medical students, along with other prevention strategies, which contributed to a decrease in the number of applied administrative procedures (isolation or quarantine).

RECOMMENDATIONS

Our findings of the demographic factors associated with KAP toward COVID-19 and the use of face-masks are generally consistent with those of previous studies elsewhere on SARS and other viral infectious diseases. The findings further suggest that health education interventions would be more effective if they targeted certain demographic groups, particularly, men, the elderly, and persons with no formal education. Continuously carry out good hygiene practices particularly hand washing, maintain appropriate social distance, limit the numbers

attending public gatherings, limit socioeconomic activities except essential services such as security, food markets, and health care; and wear face-masks also continue to be emphasized.However, the appropriate selection of face mask types needs to be improved. In disposable surgical mask-wearing behavior, how to fit the mask entirely to the face, hands not touching the mask's external surface while wearing it or removing it, the replacement time and storage method for reuse of disposable surgical masks should be particularly emphasized in future behavior change interventions.

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