HEALTH PSYCHOLOGY | RESEARCH ARTICLE

Gender and career path association with fear and adherence to Covid-19 protocols among university students

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Abstract: The study explored the association between gender and fear of Covid-19 and compliance with its safety protocols among health and non-health university students. The study sought to ascertain whether fear of Covid-19 and adherence to its protective measures would vary between male and female students of healthcare and non-healthcare university students. Using a cross-sectional quantitative research design, a convenient sample of 1119 undergraduate students selected from two universities in the Volta Region of Ghana completed self-administered questionnaires. Descriptive statistics and Mann Whitney U-test were conducted using IBM Statistical Package for Social Sciences version 25 and R software. There was no significant difference ($p = 0.14$) in the fear of Covid-19 levels of male and female undergraduate students. However, there were significant differences in the adherence to Covid-19 safety measures between male and female students ($p = 0.01$). Lastly, fear of Covid-19 and adherence to its safety measures differed significantly between healthcare and non-healthcare students ($p = 0.00$). Among students, fear of Covid-19 was independent of gender. However, female students are better adherents of Covid-19 safety measures than males. Also, non-healthcare

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PUBLIC INTEREST STATEMENT

For undergraduate students, the threat of COVID-19 could have more repercussions on their academic work and social activities. Educational institutions could be hotspots for the spread of the virus due to overcrowding and poor ventilation. Adherence to the COVID-19 safety protocols could be a challenge leading to increased infection rates. The study investigated the association between gender and fear of Covid-19 and compliance with its safety protocols among health and non-health university students. Among tertiary university students, fear of COVID-19 is independent of gender. Non-healthcare students experienced greater fear of COVID-19 and adhered better to the safety protocols than healthcare students.
students are more likely to experience greater fear of Covid-19 and adhere to its safety measures than their healthcare counterparts.

Subjects: Educational Research; Higher Education; Allied Health; Health & Society; Health Conditions; Public Health Policy and Practice; Medicine; Nursing; Allied Health; Midwifery

Keywords: Covid-19; fear; adherence; gender; safety measures

1. Introduction

The novel coronavirus pandemic has affected almost every country, territory, and region in the world (Akudjedu et al., 2020; World Health Organization, 2020). The highly contagious Covid-19 (Varol et al., 2021) has disrupted personal, work, social, economic, and academic activities widely (Alvin et al., 2020; Ofori-Manteaw et al., 2021; Surkhali & Garbuja, 2020) due to lockdown and restriction measures on large gatherings imposed by countries at the peak of the pandemic. These measures were put in place to help mitigate the spread of the virus. Other recommended preventive measures include wearing facemasks, social distancing, use of alcohol-based hand sanitizers, and practicing safe hygiene (Varol et al., 2021).

The declaration of the Covid-19 pandemic as a global health emergency by the World Health Organization (British Foreign Policy Group, 2020) heightened anxiety, fear, and psychological stress among the global populace, especially with the accompanying increasing infection rates and recorded deaths (Akudjedu, Botwe et al., 2021; Filice et al., 2020; Giacalone et al., 2020; C. Y. Lin et al., 2020; Lu et al., 2020; Mamun & Griffiths, 2020; Wu et al., 2021). Other negative effects like depression, insomnia, self-denial, and anger have all been associated with Covid-19 (Elshami et al., 2020; Elemo et al., 2020; Yadav et al., 2021). Thus, fear has been reported as the most frequent psychological response to Covid-19 (Broche-pérez et al., 2020). Fear is an unpleasant emotional state that is triggered by the perception of threatening stimuli (Broche-pérez et al., 2020). More importantly, fear of Covid-19 pandemic is associated with its high infectivity, morbidity, and mortality rates (Liu et al., 2020), with high levels of fear negatively affecting the mental state of individuals (Ahorsu et al., 2020) which can lead to racism, xenophobia attack, and suicidal ideation. For example, racism against Chinese nationals increased following the outbreak of Covid-19 in Wuhan (Mamun & Griffiths, 2020). Also, a 36-year-old Bangladeshi committed suicide because he felt he had been exposed to Covid-19 infection (Mamun & Griffiths, 2020).

So, for undergraduate students, the threat could have even more repercussions on academic work as well as social activities. Hence, students are more likely to engage in preventive behaviors when they perceive the threat as severe (Addo et al., 2020; Harper & Rhodes, 2020) and the tendency of having it adversely affecting their academic year. Of course, this could generate some level of anxiety and fear among university students. This then can lead to negative consequences particularly on their mental state when reacting to Covid-19 on campus. There is no doubt that Covid-19 has impacted educational delivery profoundly (Higgins et al., 2021; Rajhons et al., 2020; Sohrabi et al., 2021). The closure of schools following the outbreak of the pandemic affected more than 91% of students, with more than 1.2 billion children out of the classroom in 186 countries at the end of April 2020 (Rouadi & Anouti, 2020). The reopening of schools for academic activities during Covid-19 required students to adhere to Covid-19 behavioral guidelines. Essentially, the fear of Covid-19 is still prevalent and could negatively affect students (Akudjedu et al., 2020; Giacalone et al., 2020). This fear could, invariably, influence adherence to its protocols or otherwise among undergraduate students.

Another point worth noting in this whole discussion of Covid-19 is the issue of crowding and crowd control measures. Due to the large student numbers, educational institutions could be
hotspots for the spread of the virus from overcrowding and poor ventilation. Adherence to safety protocols such as regular handwashing, wearing of nose masks, observing social distancing, avoiding touching surfaces, etc, would then suffer thereby militating against measures put in place to prevent the spread of the disease. This, obviously, would increase non-adherence to the Covid-19 safety protocols making way for increased infection rates.

To this end, mention is made of previous works relating to characteristics of individuals on the effect or influence on fear and adherence to Covid-19. For example, it’s known that individual differences influence one’s perception and compliance with safety recommendations (Brouard et al., 2020). What this means is that students’ fear levels could relate to compliance with Covid-19 safety measures in schools. Moreso, race, ethnicity, gender, and age are known to be associated with threats and fear of Covid-19 (Nino et al., 2021). Other studies suggest that females are generally more likely to experience greater fear of Covid-19 than males (Doshi et al., 2020; Nino et al., 2021; Higgins et al., 2021). In a study by Broche-pérez et al. (2020), the chances of a female with high fear levels compared to low fear levels were 3.45 times more than for a male. More so, females are more psychologically susceptible to the impact of Covid-19 than males (Rossi et al., 2020). In the study by Rossi et al. (2020), females reported significantly higher levels of psychological distress following the Covid-19 outbreak. Again, age is found to be related to the risk perception of Covid-19 (Nino et al., 2021), and according to C.-Y. Lin et al. (2021), young adults tend to express more fear of COVID-19 than children and older people.

Evidently, although studies (Broche-pérez et al., 2020; Doshi et al., 2020; Mohammadpour et al., 2020; Yadav et al., 2021) have been conducted on university students, these studies have focused on college students in China, the Middle East, and Europe with limited attention on university students in African countries that have relatively reported low levels of Covid-19 infections and fatality rates. Despite these studies, Hickey and Hebert (2021) recommended additional investigations to examine differences in Covid-19 experiences among university students pursuing varying career paths to enable evidence-based decision-making by universities and health institutions. For instance, Covid-19 fear levels and adherence to its measures among healthcare and non-healthcare university students have received less empirical investigation. Thus, this study is the first to assess the influence of gender on fear and adherence to Covid-19 protocols among healthcare and non-healthcare university students.

Consequently, the objectives of the study were as follows: (1) to explore differences in the levels of fear of Covid-19 by gender and career path of students; (2) to explore differences in the levels of adherence to Covid-19 protocols by gender and career path of students.

2. Materials and method

2.1. Design, instrument, and participants
A cross-sectional quantitative research design was adopted for the study. A questionnaire was used to collect data from 1119 undergraduate university students of two universities (Ho Technical University and University of Health and Allied Sciences) in the Volta Region of Ghana. The two universities were purposely selected for the study due to their unique characteristics: (1) one of them is a technical/vocational institution offering programs in the areas of applied sciences, engineering, and the arts; (2) the other is a health university offering programs in health and allied health sciences. Both schools have a combined annual student intake of about 2500. The data collection instrument was in two parts—the first part collected some demographic information (gender, age group, institution of affiliation, program of study, mode of transport, level of study, and accommodation status of students) from the respondents. The second part of the questionnaire adopted items on fear of Covid-19 (Ahorsu et al., 2020) and adherence to Covid-19
measures (Bekalu et al., 2021; Tong et al., 2020) among others as part of a larger study. Respondents were required to respond to the items using a 5-point Likert type scale ranging from 1 (strongly disagree) to 5 (strongly agree). The duration of data collection was 1 month.

A total of 1400 questionnaires were printed; 50% were allocated to each institution. A total of 1119 responses were received, representing a 79.9% response rate. A quota sampling method was employed to allocate the questionnaires to various departments in the two institutions based on the student population of each department. After the allocation, a convenient sampling method was used in distributing the questionnaires based on the number of students that were available at the time of data collection until the questionnaires allocated to each department were exhausted. Ethical approval and permission were sought from the Research and Ethics Committee of the two universities (UHAS/REC-172; HTU/05/2021). Prior to participation in the study, verbal and written consent of students were solicited whilst being assured of confidentiality and anonymity.

2.2. Data analysis and procedure

The data were analyzed using IBM Statistical Package for Social Sciences (SPSS) and the R statistical software. The data analysis was conducted in two stages. The first stage involved the use of frequencies and percentages to describe the demographic profile of the sample. The Cronbach’s alpha test was performed to assess the reliability of the measures (fear of covid-19 and adherence to covid-19 protocols). High reliabilities of 0.98 and 0.84 were indicated for fear of Covid-19 items and adherence to Covid-19 protocols, respectively. The high reliabilities suggest the respondents were consistent in rating items relating to fear and adherence to Covid-19 protocols. Hence, the scales were uni-dimensional. The implication is that the data can be used for further inference and that total (or global) scores can also be used. The Shapiro-Wilk normality test was performed on the composite scores for fear and adherence to Covid-19 protocol items and revealed the data were not normally distributed.

The second stage of the data analysis used the Mann-Whitney U test (based on the normality test result) to explore differences in levels of fear and adherence to Covid-19 protocols between male and female undergraduate students and to explore differences in levels of fear and adherence to Covid-19 protocols between healthcare or non-healthcare university students. Mann-Whitney U test is a non-parametric statistical tool used to assess differences in two independent samples, on the assumption that data do not meet the normality requirement. The two independent samples, in this case, are males and females; and health university students and non-health university students.

3. Results and findings

3.1. Demographic statistics

Table 1 presents information on the demographic characteristics of the respondents. Out of the 1119 respondents, there were more males (54.7%, n = 612) in the sample than females (45.3%, n = 507) with the majority of respondents (57.1%, n = 639) falling in the age group 19–21 years. A little over half of the respondents (50.9%, n = 570) were non-healthcare students whereas 49.1% constituted healthcare students. Also, most of the respondents (41.6%, n = 645) were in the first year of their schooling. Regarding the program of study, the majority of the respondents pursued health-related programs (47.8%, n = 535) followed by engineering (18.9%, n = 212). Concerning students’ accommodation, most of the respondents (68.8%, n = 770) were privately accommodated (non-resident) whilst 31.2% (n = 349) indicated being accommodated by the university (residents). Most of the respondents (n = 486, 43.4%) commuted to school by foot. School bus (n = 217, 19.4%), tricycle (n = 203, 18.1%), and commercial vehicles (n = 154, 13.8%) were other means of transport used by the respondents.
3.2. Fear of Covid-19

Table 2 presents summary statistics of scores on fear of Covid-19. Majority of the respondents either agreed ($n = 315, 28.2\%$) or strongly agreed ($n = 193, 17.2\%$) of being worried about getting infected with coronavirus by people around them with a median score of 3.29. Again, most of the respondents ($n = 436, 39\%$) either strongly agreed or agreed to be afraid of the coronavirus, with the majority ($n = 467, 41.7\%$) also expressing the fear of being afraid of losing their lives because of the pandemic. Similarly, most of the respondents ($n = 451, 40.3\%$) reported being nervous when listening to news items on coronavirus. On the contrary, most of the respondents either strongly disagreed ($n = 425, 38\%$) or disagreed ($n = 294, 26.3\%$) about experiencing sleepless nights because of being worried about getting infected with Covid-19. Based on fear of Covid-19 cut-off scores, about 36.8\%
reported minimal fear followed by 29.3% (328) students who indicated moderate fear. Another 23.5% of the students experienced mild fear whiles 10.4% (116) reported severe fear of Covid-19.

### 3.3. Adherence to Covid-19 protocols
Table 3 presents summary statistics of scores on adherence to Covid-19 safety protocols. Of the 16 Covid-19 preventive measures examined in the study, students appeared comfortable adhering to the wearing of face masks and staying at their hostels without going out unless very important followed by washing of hands and using hand sanitizers. However, avoiding visits from friends and coursemates, as well as hugging, were least practiced by the students. In addition, adherence to the 2-m distance at lectures and open spaces was least followed.

### 3.4. Fear of Covid-19 by gender and career path of students
Table 4 presents results of inference on fear of Covid-19 by gender and career path of students. The Mann-Whitney U test was used to explore differences in the fear of Covid-19 between male and female students. As indicated in the table, female respondents felt more uncomfortable thinking about Covid-19 than the males ($p = 0.00$) and were also more anxious when listening to news items on Covid-19 than males ($p = 0.01$). However, there was no significant difference between male and female students in terms of experiencing sleepless nights ($p = 0.07$), getting worried about being
### Table 3. Adherence to Covid-19 measures

| Covid-19 Adherence measure | % | Median |
|---------------------------|---|--------|
| Using face masks at lectures/classrooms | | |
| Never                      | 2.3 | 5.0 | 19.5 | 21.9 | 50.8 | 4.32 |
| Rarely                     | 5.0 | 22.3 | 24.0 | 44.4 | 4.19 |
| Sometimes                  | 19.5 | 21.0 | 40.9 | 4.05 |
| Often                      | 21.9 | 40.9 | 4.05 |
| Always                     | 50.8 | 4.05 |
| Using face mask while going outside | | |
| Never                      | 2.2 | 9.7 | 23.9 | 21.0 | 40.9 | 4.05 |
| Rarely                     | 7.1 | 22.3 | 24.0 | 44.4 | 4.19 |
| Sometimes                  | 22.3 | 21.0 | 40.9 | 4.05 |
| Often                      | 24.0 | 40.9 | 4.05 |
| Always                     | 44.4 | 4.05 |
| I stay at my hostel without going outside unless necessary | | |
| Never                      | 4.5 | 23.9 | 21.0 | 40.9 | 4.05 |
| Rarely                     | 4.5 | 23.9 | 21.0 | 40.9 | 4.05 |
| Sometimes                  | 9.7 | 23.9 | 21.0 | 40.9 | 4.05 |
| Often                      | 23.9 | 21.0 | 40.9 | 4.05 |
| Always                     | 23.9 | 21.0 | 40.9 | 4.05 |
| Washing of hands           | 2.1 | 6.6 | 29.7 | 25.6 | 36.1 | 3.96 |
| Using of hand sanitizer    | 2.8 | 8.8 | 26.9 | 26.0 | 35.6 | 3.95 |
| Leaving the home/hostel for church/mosque | | |
| Never                      | 5.8 | 9.9 | 29.6 | 27.2 | 27.5 | 3.69 |
| Rarely                     | 5.8 | 9.9 | 29.6 | 27.2 | 27.5 | 3.69 |
| Sometimes                  | 9.7 | 23.9 | 21.0 | 40.9 | 4.05 |
| Often                      | 9.7 | 23.9 | 21.0 | 40.9 | 4.05 |
| Always                     | 23.9 | 21.0 | 40.9 | 4.05 |
| Cleaning classroom tables/chairs before using them | | |
| Never                      | 3.8 | 15.5 | 32.5 | 22.7 | 25.4 | 3.52 |
| Rarely                     | 3.8 | 15.5 | 32.5 | 22.7 | 25.4 | 3.52 |
| Sometimes                  | 15.5 | 32.5 | 22.7 | 25.4 | 3.52 |
| Often                      | 32.5 | 22.7 | 25.4 | 3.52 |
| Always                     | 32.5 | 22.7 | 25.4 | 3.52 |
| I keep adequate distance when I communicate with others | | |
| Never                      | 5.1 | 18.5 | 37.9 | 18.9 | 19.6 | 3.26 |
| Rarely                     | 5.1 | 18.5 | 37.9 | 18.9 | 19.6 | 3.26 |
| Sometimes                  | 18.5 | 37.9 | 18.9 | 19.6 | 3.26 |
| Often                      | 18.5 | 37.9 | 18.9 | 19.6 | 3.26 |
| Always                     | 37.9 | 18.9 | 19.6 | 3.26 |
| Cleaned surfaces that are touched frequently (such as doorknobs) | | |
| Never                      | 6.7 | 19.1 | 33.6 | 21.5 | 19.0 | 3.27 |
| Rarely                     | 6.7 | 19.1 | 33.6 | 21.5 | 19.0 | 3.27 |
| Sometimes                  | 19.1 | 33.6 | 21.5 | 19.0 | 3.27 |
| Often                      | 19.1 | 33.6 | 21.5 | 19.0 | 3.27 |
| Always                     | 33.6 | 21.5 | 19.0 | 3.27 |
| Avoiding the touching of my eyes, nose and mouth | | |
| Never                      | 6.0 | 17.4 | 37.2 | 22.4 | 17.0 | 3.27 |
| Rarely                     | 6.0 | 17.4 | 37.2 | 22.4 | 17.0 | 3.27 |
| Sometimes                  | 17.4 | 37.2 | 22.4 | 17.0 | 3.27 |
| Often                      | 17.4 | 37.2 | 22.4 | 17.0 | 3.27 |
| Always                     | 37.2 | 22.4 | 17.0 | 3.27 |
| Maintaining 2-meter distance at lectures | | |
| Never                      | 11.8 | 19.9 | 27.9 | 18.0 | 22.4 | 3.19 |
| Rarely                     | 11.8 | 19.9 | 27.9 | 18.0 | 22.4 | 3.19 |
| Sometimes                  | 19.9 | 27.9 | 18.0 | 22.4 | 3.19 |
| Often                      | 19.9 | 27.9 | 18.0 | 22.4 | 3.19 |
| Always                     | 19.9 | 27.9 | 18.0 | 22.4 | 3.19 |
| Leaving the hostel/home for socializing | | |
| Never                      | 9.6 | 20.4 | 35.8 | 18.0 | 16.3 | 3.08 |
| Rarely                     | 9.6 | 20.4 | 35.8 | 18.0 | 16.3 | 3.08 |
| Sometimes                  | 20.4 | 35.8 | 18.0 | 16.3 | 3.08 |
| Often                      | 20.4 | 35.8 | 18.0 | 16.3 | 3.08 |
| Always                     | 35.8 | 18.0 | 16.3 | 3.08 |
| Maintaining 2-meter distance in open areas (campus) | | |
| Never                      | 9.5 | 20.5 | 39.4 | 14.8 | 15.8 | 3.01 |
| Rarely                     | 9.5 | 20.5 | 39.4 | 14.8 | 15.8 | 3.01 |
| Sometimes                  | 20.5 | 39.4 | 14.8 | 15.8 | 3.01 |
| Often                      | 20.5 | 39.4 | 14.8 | 15.8 | 3.01 |
| Always                     | 39.4 | 14.8 | 15.8 | 3.01 |
| Maintaining 2-meter distance in closed space | | |
| Never                      | 8.4 | 23.7 | 35.8 | 17.8 | 14.3 | 3.00 |
| Rarely                     | 8.4 | 23.7 | 35.8 | 17.8 | 14.3 | 3.00 |
| Sometimes                  | 23.7 | 35.8 | 17.8 | 14.3 | 3.00 |
| Often                      | 23.7 | 35.8 | 17.8 | 14.3 | 3.00 |
| Always                     | 35.8 | 17.8 | 14.3 | 3.00 |
| Hugging coursemates and other students | | |
| Never                      | 15.6 | 22.6 | 33.4 | 15.9 | 12.2 | 2.81 |
| Rarely                     | 15.6 | 22.6 | 33.4 | 15.9 | 12.2 | 2.81 |
| Sometimes                  | 22.6 | 33.4 | 15.9 | 12.2 | 2.81 |
| Often                      | 22.6 | 33.4 | 15.9 | 12.2 | 2.81 |
| Always                     | 33.4 | 15.9 | 12.2 | 2.81 |
| I don’t allow course mates, hostel mates and friends to visit me at the hostel | | |
| Never                      | 17.2 | 24.0 | 32.4 | 13.5 | 12.8 | 2.73 |
| Rarely                     | 17.2 | 24.0 | 32.4 | 13.5 | 12.8 | 2.73 |
| Sometimes                  | 24.0 | 32.4 | 13.5 | 12.8 | 2.73 |
| Often                      | 24.0 | 32.4 | 13.5 | 12.8 | 2.73 |
| Always                     | 32.4 | 13.5 | 12.8 | 2.73 |

Never = 1; rarely = 2; sometimes = 3; often = 4; always = 5
### Table 4. Fear of Covid-19 (Median scores) by gender and career path of students

| Fear of Covid-19                                      | Gender       | Z  | P – value | Career Path of Students | Z  | P – value |
|------------------------------------------------------|--------------|----|-----------|-------------------------|----|-----------|
|                                                      | Male         | Female |           | Non-Healthcare          | Healthcare |           |
| I am afraid of coronavirus                           | 3.10         | 3.18 | −1.35     | 3.25                    | 3.02 | −2.27     | 0.02 |
| It makes me uncomfortable to think about coronavirus | 2.79         | 3.09 | −3.09     | 3.07                    | 2.76 | −4.02     | 0.00 |
| My hands become sweaty/moist when I think about coronavirus | 1.78         | 1.92 | −2.01     | 1.99                    | 1.71 | −4.75     | 0.00 |
| I am afraid of losing my life because of coronavirus | 3.03         | 3.13 | −1.29     | 3.34                    | 2.80 | −4.22     | 0.00 |
| I become nervous/anxious when I listen to and watch news items about coronavirus from social media/radio/TV | 2.98         | 3.23 | −2.81     | 3.21                    | 2.99 | −2.95     | 0.00 |
| I experience sleepless nights because I’m worried about getting infected with coronavirus | 1.89         | 2.07 | −1.80     | 2.17                    | 1.82 | −4.50     | 0.00 |

(Continued)
Table 4. (Continued)

| Gender                  | Z     | P – value | Career Path of Students | Z     | P – value |
|-------------------------|-------|-----------|-------------------------|-------|-----------|
|                         |       |           | Non-Healthcare          |       |           |
| Male                    | 2.19  | 2.37      | 2.54                    | 2.00  | −5.17     |
| Non-Healthcare          |       |           |                         |       |           |
| Female                  | −1.70 | 0.09      | 2.00                    | −5.17 | 0.00      |
| Healthcare              |       |           |                         |       |           |
| Overall fear of         |       |           |                         |       |           |
| Covid-19                | 2.68  | 2.80      | 2.90                    | 2.56  | −4.783    |
| Overall fear of         |       |           |                         |       |           |
| Covid-19                | −1.47 | 0.14      | −4.783                  | 0.00  |           |

My heart races/palpitates when I think about getting coronavirus

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| Covid-19 measure | Gender | Z    | P – value | Career Path of Students | Z     | P – value |
|------------------|--------|------|-----------|-------------------------|-------|-----------|
|                  | Male   | Female |          | Non-Healthcare | Healthcare |          |
| Maintaining 2-meter distance in open areas (campus) | 3.02   | 3.00   | −0.42 | 0.67 | 3.36 | 2.74 | −8.22 | 0.00 |
| Maintaining 2-meter distance in closed space | 3.02   | 2.98   | −0.25 | 0.80 | 3.35 | 2.71 | −8.33 | 0.00 |
| Maintaining 2-meter distance at lectures | 3.18   | 3.20   | −0.110 | 0.91 | 3.61 | 2.79 | −8.12 | 0.00 |
| Using face mask while going outside | 4.09   | 4.29   | −2.84 | 0.01 | 4.18 | 4.19 | −0.137 | 0.89 |
| Using face mask at lectures/classrooms | 4.27   | 4.38   | −1.58 | 0.11 | 4.26 | 4.39 | −2.19 | 0.03 |
| I stay at my hostel without going outside unless necessary | 3.85   | 4.22   | −4.13 | 0.00 | 4.14 | 3.93 | −2.48 | 0.01 |
| I keep adequate distance when I communicate with others | 3.22   | 3.30   | −0.86 | 0.38 | 3.48 | 3.05 | −5.81 | 0.00 |
| I don’t allow course mates, hostel mates, and friends to visit me at the hostel | 2.73   | 2.74   | −0.26 | 0.80 | 2.98 | 2.49 | −6.21 | 0.00 |

(Continued)
| Gender | Career Path of Students | Z  | P-value |
|--------|------------------------|----|---------|
|        | Non-Healthcare         |    |         |
| Male   | Leaving the home/hostel for church/mosque | 3.60 | 0.02 |
| Female | Leaving the home/hostel for church/mosque | 2.97 | 0.11 |
|        | Leaving the hostel/home for socializing | 3.15 | 0.06 |
| Male   | Washing of hands | 3.77 | 0.00 |
| Female | Washing of hands | 4.17 | 0.00 |
|        | Using of hand sanitizer | 3.69 | 0.00 |
| Male   | Cleaning surfaces that are touched frequently such as door knobs | 3.13 | 0.00 |
| Female | Cleaning surfaces that are touched frequently such as door knobs | 4.21 | 0.00 |
|        | Hugging course mates and other students | 2.74 | 0.00 |
| Male   | Avoiding touching of my eyes, nose and mouth | 3.39 | 0.00 |
| Female | Avoiding touching of my eyes, nose and mouth | 3.67 | 0.00 |
|        | Cleaning classroom tables/chairs before using them | 3.90 | 0.00 |
| Male   | Overall adherence to Covid-19 measures | 3.73 | 0.00 |
| Female | Overall adherence to Covid-19 measures | 3.64 | 0.00 |

Table 5. (Continued)
infected \( (p = 0.53) \) and the fear of losing one's life due to Covid-19 \( (p = 0.20) \). Overall, the observed difference in the fear of Covid-19 for male and female students was not statistically significant \( (p = 0.14) \).

Regarding differences in fear of Covid-19 based on career path of students, the findings of the study suggest a significant difference \( (p = 0.00) \) between healthcare and non-healthcare students. The non-healthcare students reported higher levels of fear of Covid-19 than the healthcare students on all the seven items measuring fear of Covid-19.

3.5. Adherence to Covid-19 protocols by gender and career path of students

Table 5 presents results of inference on adherence to Covid-19 protocols by gender and career path of students. Regarding gender and adherence to Covid-19 preventive measures, the results showed insignificant differences between the males and females concerning observing social distancing and leaving the hostel for socialization. However, overall, the female students were more likely than their male counterparts to adhere to the safety measures \( (p = 0.00) \). In respect of specific safety measures, female students were significantly more likely to adhere to the use of face masks \( (p = 0.01) \), hand washing \( (p = 0.00) \), use of sanitizer \( (p = 0.00) \), cleaning of surfaces \( (p = 0.00) \), and staying indoors without going out unnecessarily.

In exploring the relationship between the career path of students and adherence to Covid-19 protocols, non-health students adhered to most to the Covid-19 safety measures than their healthcare counterparts. There were significant differences in the adherence to all Covid-19 protocols between healthcare and non-healthcare students except for the use of face masks \( (p = 0.89) \), leaving home/hostel for church or mosques \( (p = 0.38) \), leaving home/hostel for socialization \( (p = 0.06) \), washing of hands \( (p = 0.16) \) and use of hand sanitizer \( (p = 0.93) \). There was a significant difference \( (p = 0.00) \) in the overall adherence to Covid-19 safety protocols between healthcare and non-healthcare students.

4. Discussion

The results and findings of the data analysis present critical issues for discussion in this section. We organized these per the two main objectives of the study: Consequently, the objectives of the study are: (1) explore differences in the levels of fear of Covid-19 by gender and career path of students; (2) explore differences in the levels of adherence to Covid-19 protocols by gender and career path of students.

4.1. Fear of Covid-19 by gender and career path of students

In this study, the respondents expressed fear of getting infected with COVID-19 and losing their lives. High levels of fear could affect the mental and psychosocial well-being of an individual (Ahorsu et al., 2020; Wu, Kwakkenbos, et al., 2020). Previous studies reported that the female gender was significantly associated with greater fear and psychological impact of the Covid-19 pandemic than the male gender (Broche-pérez et al., 2020; Rossi et al., 2020, C.-Y. Lin et al., 2021). However, the studies were related to the general population and not specific to a cohort of students with similar characteristics. In this study, fear was independent of gender which is also consistent with findings from a similar study (Bisht et al., 2021). The findings from this study show that all students irrespective of gender felt the same kind of fear due to Covid-19. This could be attributed to the fact that the study was conducted among a population (cohort) with very similar characteristics. Also, could comorbidities that are less prevalent in younger age groups have limited their fears? In this study, the students were of similar younger age and unlikely to have comorbidities that would put them at greater risk, hence, both the males and females expressed similar psychological responses. The findings from this current study, therefore, suggest that among a population of students, there is the need to design interventions that reduce the negative psychological impact of the Covid-19 pandemic on both genders.
This study also found that non-healthcare students reported higher levels of fear of Covid-19 than the healthcare students on all the seven items measuring fear of Covid-19. This could be because health trainees during their training are exposed to complex disease conditions, their diagnosis, prevention, and treatment and hence are protected from fear of COVID-19 than the non-health students. Due to their programs of study, healthcare students are likely to possess high health literacy that insulates them against the fear of COVID-19 unlike their counterparts studying non-healthcare programs. This finding is novel since no study explored this association.

4.2. Adherence to Covid-19 safety protocols by gender and career path of students

The study revealed compliance with Covid-19 safety measures among the respondents. The physical distancing protocol was the most difficult safety measure to adhere to. This could be because as social beings, it is not too pleasant to avoid people you are familiar with. Overall, adherence to COVID-19 safety measures was differentiated by gender. The females adhered to the safety measures better than their male counterparts similar to previous studies (Haischer et al., 2020; Lau et al., 2004). Having greater fear is likely to influence one’s adherence to safety measures. Females are likely to ensure strict adherence to Covid-19 protocols due to high fear as reported in previous studies (Broche-pérez et al., 2020; Rossi et al., 2020). However, in this current study, gender was found to be independent of fear. Furthermore, females are naturally hygiene conscious and are socialized to be clean and are therefore likely to clean surfaces, wash hands regularly, and use sanitizers more often than males.

On the other hand, the adherence to Covid-19 protocols was related to the career paths of students. Non-healthcare students adhered the most to the Covid-19 safety measures than the healthcare students. This could be because the non-healthcare students exhibited greater fear and hence were more likely to observe the safety measures. This is consistent with earlier findings that suggest that individuals are more likely to engage in preventive behaviors when they perceive the threat of Covid-19 as severe (Addo et al., 2020; Harper & Rhodes, 2020).

5. Conclusion

The study revealed that there are no significant differences in the fear of Covid-19 for male and female students and that non-healthcare students reported higher levels of fear of Covid-19 than the healthcare students on all the seven items measuring fear of Covid-19. It was also revealed that overall, female students were more likely to adhere to the safety measures than their male counterparts. Similarly, non-health students adhered to most of the Covid-19 safety measures than their healthcare counterparts.

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Disclosure statement

No potential conflict of interest was reported by the author(s).

Data availability statement

The data that support the findings of this study are openly available in “figshare” at https://doi.org/10.6084/m9.figshare.17868707.v1
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