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From the desk. To the bench. To the bedside.

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Experiences and challenges in telemedicine of physicians from the National Capital Region during the COVID-19 pandemic: A qualitative study

Ma. Shaina Isabel S. Hilomen[1], Mikaela Marie A. Haveria[1], Carlo Lorenzo B. Hernandez[1], Denise D. Hernandez[1], Gabrielle Dominique I. Herradura[1], James F. Huan[1], Greg Mikhail B. Hubo[1], Alan June O. Icaonapo[1], Jonathan C. Idolor[1], Francesca Nadine Wing-Chun O. Ip[1] , Franciosa Luningning Gavino-Collins[1], MD, MPH, Ma. Peñafrancia L. Adversario, MD, FPPS, MSPH[1], Teresa Diana B. Bongala, MD, MSPH, FPOGS[2]

Abstract

Introduction The COVID-19 pandemic caused a shift to delivering health services through telemedicine. This study recognized the perceptions, experiences, and challenges of physicians who practice synchronous teleconsultation in the Philippines.

Methods: A qualitative descriptive research design using purposive sampling, eight physicians from NCR were interviewed. Data collected were subjected to thematic analysis for common themes and integrated into an analytic narrative.

Results: Eight physicians were included as participants. Different measures taken to remedy the gap included upskilling of physicians, adjustment of clerical work, ensuring data privacy, and creating a conducive workplace. Remote consultations posed limitations on physical examination and emphasized the reliance on diagnostics. Digital platforms used depended on the physician's preference, type of practice, and patient's accessibility. This led to an increased dependency on good internet and network service connections to ensure smooth teleconsultations. A lack of respect for the physician's personal boundaries and work-life balance was cited as a major challenge.

Conclusion: Telemedicine proved to be an option to provide healthcare despite its limitations, but the shift to its practice exposed many challenges as it is not a replacement for physical consultations.

Key words: COVID-19, telemedicine, synchronous teleconsultation

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Due to the COVID-19 pandemic, enhanced community quarantine (ECQ) was imposed over the whole of Luzon (Philippines), limiting operations, including physicians with their own private practice have altered the way healthcare is provided.[1,2] Although it was not a novel idea, advancements in internet and mobile connectivity have furthered adopting the use of telemedicine in the Philippines as a mode of practice during the pandemic.[3-12] The World Health Organization (WHO) describes telemedicine, used

synonymously with telehealth, as: "The delivery of health care services, where distance is a critical factor, by all healthcare professionals using information and communication technologies (ICT) for the exchange of valid information for diagnosis, treatment, and prevention of disease and injuries, research and evaluation, and for the continuing education of healthcare providers, and their communities".[13] The use of telemedicine encompasses teleconsultation, teleconferencing, tele-proctoring, tele-education, telecare, telemonitoring, screening of diseases, and health care delivery.[14-16] Specifically, teleconsultation focuses on the diagnosis and treatment in sites that are distant from the physician or primary care provider and can be further divided into asynchronous (monitoring or follow up through email and automated or text messages) and synchronous (real time, face-to-face interaction between the patients and healthcare provider via teleconferencing), with the latter being a better predictor of challenges and views related to telemedicine.[14,17-20]

Despite struggling with challenges that encompass technological, social, and political domains, developing countries were not exempt from the mass migration in telemedicine and rapid adoption of systems brought about by COVID-19 restrictions.[5,21-25] Data suggest that while developed countries continue to advocate for a greater telemedicine coverage, developing countries are still left at the infancy stage due to the shortage of trained healthcare professionals and the resistance of physicians to go against the traditional approach of face-to-face interaction.[22] Other salient challenges faced by physicians involved changes in workplace factors, impaired work-life balance, and demographic factors, such as age.[10-11] The present study was conducted to address several research gaps regarding the barriers to telemedicine in developing countries, especially the Philippines wherein telemedicine is being adopted by more physicians. The study aimed to assess the physicians' awareness, perception, and practices regarding telemedicine, and to describe the challenges and experiences of physicians who practiced telemedicine in the Philippines during the COVID-19 pandemic.

Methods

The study employed a qualitative descriptive research design guided by the epistemological position of social constructionism focused on the construction of the reality of those who currently engage in the practice of telemedicine, specifically synchronous teleconsultations from physicians practicing in the National Capital Region (NCR) during the COVID-19 pandemic.

In-depth interviews were done as they brought out experiences and perspectives that are substantial and can be further expounded on. It also elicited flexibility and conversations about a range of topics.

Purposive sampling was done by utilizing connections of the researchers such as friends or affiliates of the researchers' relatives or mentors. Possible participants were contacted via email or direct messaging and these connections themselves may also refer to others who fit the criteria. Since age and practicing experience were listed as variables that could have differences in response and could be an area of interest, this study focused on participants of a specific age group (ages 20–40 and ages 41 and up). This study also followed findings that revealed synchronous teleconsultations as an aspect that elicited vast barriers and challenges regarding the phenomenon being studied.[19,20]

From August to September 2021, participants underwent in-depth interviewing by two researchers (one interviewer and one scribe) in Zoom, an online audiovisual setting, that lasted for 1 to 1.5 hours. The interviewer communicated with the participant while the scribe transcribed additional observations and stood by as a replacement in case the interviewer lost connection. Direct quotations from the participants were included to enrich the results of the analysis. A Zoom recording was also available to serve as a later reference during data analysis. The study followed a six-step data analysis procedure for thematic analysis by Braun and Clarke.[26] The analysis involved the following steps which were done by the researchers:

1. Familiarization with the data through reading and rereading the interview transcripts and listening to the audio recordings.
2. Coding the data by identifying features that are relevant to the research questions.
3. Searching for themes by clustering codes that share unifying features to create a coherent thematic map of the data.
4. Reviewing if the generated themes reveal something useful about the research question as well as checking if they fit the meanings that arose in the encoded data and the entire data set.

5. Defining and naming the themes, ensuring that the essence, scope, and boundaries of each are clearly emphasized.
6. Writing the report guided by the generated themes. This includes providing excerpts from the interviews to strengthen the analytic narrative.

The study was approved by the UERMMMCI Research Institute for Health Sciences Ethics Review Committee.

Results

There were 8 participants who were physicians aged 29-65 years included in the study. There were 7 superordinate themes and 22 subthemes derived and discussed below.

1. Understanding telemedicine as part of medical practice

a. Telemedicine: use of digital media for medical consultation. Various digital media have been the centerpiece when talking about telemedicine with P6, a 29-year-old internist, working in a government hospital, defining telemedicine as essentially the act of consultation between a patient and a physician through an online or electronic medium, mobile, voice call over an internet platform, or social media for the purpose of whatever it is that the patient wants to consult for a medical reason.

b. Uncovering the existing role of telemedicine in the midst of a crisis. However, the use of the term and concept was not dominant before. P1, a 60-year-old cardiologist with his own private practice, said that he would assume that every doctor has been doing telemedicine since time immemorial in the sense.

2. Efforts made to bridge the gap of telemedicine

a. *Physician upskilling as a necessary step*. P3 learned about telemedicine by independently studying telemedicine articles she found from a university's website. P1, on the other hand, stated that he had attended webinars conducted by a university that have helped him understand the process of telemedicine and how to use it. In addition to learning about how to perform the consultations online, P5, a 40-year-old internist, mentioned that she also had to prepare her hospital's interns by teaching them how to perform the neurological exam online.

b. *Adjustments on clerical work for teleconsultation routine*. The physicians are supported by other people to perform their consultations. For P1, his secretary handles the scheduling and the billing of the consultation. This was also how P3 handles the scheduling and payments for her teleconsultations. In one hospital, there are delegated personnel that manage scheduling and triaging of patients as P6 stated.

c. *Undertaking data privacy measures prior to teleconsultation*. The patients had to provide their informed consent to the physician before any teleconsultation started as P5 recalled. P3 stated that this was also the process she undertakes before starting her teleconsultation proper. In the hospital where P6 practices, patient data privacy is safeguarded by limiting access to the patient charts via a passcode-generated system.

d. *Creating a conducive environment*. P1 describes his different setups at his clinic and his home. His set-up ensures that he can work efficiently while still presenting himself professionally. P3, who conducts telemedicine at her house, reported that she chose her bedroom as this was quieter. For P6, he shared that their hospital had provided a room where they had access to computers for telemedicine purposes.

3. The virtual patient: navigating medicine without physical contact

Mainly, the lack of physical contact emerged in the interviews, and it encompassed different aspects on how the physicians communicate and manage their patients.

a. *Limited physical examination: altering the diagnostic process*. P7, a 32-year-old Obstetrics-Gynecology (OB-GYN) resident who does

telemedicine in a government hospital. This lack in obtaining outright findings is further explained by P5 when she confirmed her statement on preferring in-person consultations. P6, the lack of physically examining his patients and only relying on the information given to him meant that he would have to rely on his patients' knowledge about their own health status. However, P8, a 31-year-old general practitioner working for a private company, asserted that despite having access to all the history and information, there would still be a distinction in understanding the patient's current state.

b. *Shifting reliance on history & diagnostic tests*. It was evident for the majority of the physicians that they moved on to relying on history and diagnostic tests in order to manage the patients given the limitations (P5). P7 expressed a comparable perspective and mentioned that the challenge becomes more pronounced when patients fail to obtain laboratory results. In the context of his role as a cardiologist, P1 elaborated on the laboratory tests he would prioritize in the absence of a physical examination. Facing the absence of visual cues and relying on phone calls as a medium, P8 described her dependence on patients' complaints and descriptions of their symptoms.

c. *Limited nonverbal communication hinders observation and rapport building*. Most of the physicians expressed difficulty to the changes brought about by limited nonverbal cues including patient understanding, reactions, and facial expressions. The importance of being able to see their patients in video calls was also expressed by P8, whose consultations are held via phone call setting, when asked if there is something she would prefer to have during her teleconsultations. P4 also had the same sentiments and emphasized the difference in relation to her work as a psychiatrist. The lack of visual cues specifically impacted P6 whenever he takes teleconsultations on the phone as his practice is similar to P8.

d. *Ensuring patient understanding of illness management*. The difficulties that were conveyed by the physicians also came with efforts that they make in order to be sure that their medical advice is understood clearly by their patients. Such efforts made in relation to her patient demographic are explained by P7. For P1, he focuses on following what he learned from webinars. That is, writing down the information about the whole consultation so that he can give it to his patients after.

e. *Shorter duration of teleconsultations*. With the physical examination being limited, P1 reported that it led to the shortened duration. P6 noted that the physical examination takes up time and gave a specific consult duration. P2, a 57-year-old OB-GYN who has her own clinic and practices telemedicine privately, had a similar response to P1 on how face-to-face is much longer than telemedicine in relation to their numerous patient encounters.

4. Digital media platforms: telemedicine's tools

a. *Based on the doctor's preference*. Some physicians chose their platforms based on its features and intuitiveness. For P4, she chose to use Zoom in conducting her consultations and also availed of another application to send her prescriptions and P3, who claimed not to be well-versed in technology, attempted to make use of other applications in conducting her telemedicine but she found these other applications harder to use, so she continued to use Zoom instead. For P2, she chose her platform wherein she can conduct telemedicine with video call as she prefers to see her patient's face during consultations.

b. *Based on the patient's preference*. The patients also have an influence on the platform used by the physician for telemedicine as some patients are not familiar with using these. For P1, he chose to use Viber for his patients who are not familiar with using the Zoom app. For P6, he conducts telemedicine purely by phone calls as he acknowledges that their patients

may have limited accessibility in making video calls.

c. *Based on type of practice private practice vs hospital directed practice.* For those in private practice, physicians make use of platforms that they can easily have access to. Those who work in hospitals, on the other hand, were provided with available platforms to practice their telemedicine. P5 recalled that their hospital has availed applications for telemedicine. P6 stated that at their hospital, they make use of an online program to manage telemedicine scheduling. This program was developed for the hospital's use as they transition their face-to-face consultations to telemedicine.

d. *Electronic medical record (EMR) use*. Some physicians have started digitizing their patient's medical information as they transition to using telemedicine outside of their clinics. P1 stated that having his patient charts digitized would make it accessible and convenient for him to do telemedicine outside his clinic.

5. Unstable connection: different connectivity use in telemedicine

a. *Internet connectivity use*. It became evident that their concerns on patient communication and understanding were aggravated by internet connectivity problems. P1 has personally experienced such concern. For P8, she views such events like power outages as inevitable in the shift of her practice, while P2, on the other hand, saw two sides to the problem, explaining that it is either her or her patients who are struggling.

b. *Mobile network connectivity use*. The different platforms that were chosen or utilized by the physicians also relied on their mobile network subscriptions and the quality of signal they get from them. P6 and P8 specifically relate to this as they mainly use cell phones in their practice. For P6, he expressed that the poor signal, along with his older patients not being tech savvy, contributed to the difficulty in relying on mobile networks. In P5's case, she uses both internet connection and mobile network connection on the same level. She expressed having to go on rounds at the hospital, aside from her teleconsultations. She added that there was a need for an extra telecommunication provider during her phone consultations.

c. *Communication woes: troubleshooting as an added physician responsibility*. Physicians had to navigate the platforms that they are using as well as learn how to fix the problems that come with it. Attempts to handle connectivity problems include rescheduling the appointments or recontacting the patients in order to finish the consultations. P5 laid out how she and her subordinate handle disconnected calls and P6 echoed this rescheduling solution and further added that he ends up using his personal phone in order to efficiently get back to his patient in times of disconnection. In P8's practice, her hospital's system allows her to communicate with her colleagues whenever problems on her end rises. She explained that she often relies on them every time her connection or signal is inadequate. Regarding the issue of encountering blurry pictures, P7 naturally stated that her only recourse is to ask the patient to resend them.

6. Crossing the boundaries between work and personal lives

a. *Bringing the work home: the disruption of work-life balance*. Physicians began conducting telemedicine within the safety of their homes. P1 recalled having to bring home patient charts in order to properly facilitate online patient consultations during the various community lockdowns. For P4, it is not a matter of bringing the work home, but not being able to finish her work until the end of the night; there is no longer a clear cut-off for when the workday ends and her personal life begins. This transition of leaving work at the office and taking it into the private sanctuary of a home was the beginning of the blurring and subsequent breaking of the boundaries

between home and work life. P6 described it as that it is a strain since you have to bring work at home.

b. *The gray area: patient's encroachment of doctor's time and availability*. Without the presence of a physical clinic to go to, physicians became more accessible. While this may have been a benefit for patients, it became a source of discontent for physicians like P8 and P5. Physicians have tried to reset the boundaries that once existed during physical consultations. A common thread that most physicians seem to have noticed is that the number given to the patients becomes misconstrued as an emergency hotline rather than the doctor's contact information (P7).This so-called abuse also comes from the lack of compensation for the physician's time. P5 noticed that, despite her efforts to do her duty as a physician, patients take advantage of the flexibility of teleconsulting. P7 claimed that the consistent break in a physician's boundaries is the worst part of telemedicine.

c. *Measures taken to prevent exploitation by patients*. Physicians began creating and implementing their own strategies in order to reinstate the boundaries that had been severely broken during the pandemic. For P5, her definition of telemedicine changed drastically after having her boundaries as a physician invaded several times by patients. P8 has been keen in identifying fake RT-PCR results during her practice of telemedicine and began utilizing the following strategy to protect her license as a physician. For those who can afford to do so, new phone lines had to be purchased to maintain their privacy which P2 had to do, not only for herself, but also for her husband and their secretary while some physicians chose not to allow patients to contact them; rather, they would have the patients contact their secretary. Others set up strict rules for payment in order to ensure that they would get proper compensation for their work. P5 established a policy for her patients, stipulating that payment must be made in advance.

7. Acknowledgement of telemedicine as a viable option

a. *Limited options of practice and alternatives as driver of telemedicine use*. However, since it quickly became the dominant practice at the onset of the pandemic, the physicians had to learn how to do telemedicine either on their own or under the instruction of the hospital they are attached to as soon as they could. P6 emphasized that the COVID-19 preventive guidelines have had an impact on the feasibility of in-clinic consultations. Likewise, P8 addressed the challenges posed by safety guidelines, social distancing measures, and restricted transportation mobility in the context of continuing in-clinic consultations. The recurring theme in their sentiments is the limited availability of alternative options.

b. *Exceptions to Telemedicine use*. Although telemedicine has been the dominant practice, exemptions are made for special populations such as pregnant patients, illiterate patients, and patients in medical emergencies. Taking this factor into consideration, telemedicine and face-to-face consultation are considered not mutually exclusive.

d. *Similarities between face-to-face and telemedicine*. It would do well to state that there are some similarities between face-to-face consultations and telemedicine. P6 stated that they proceed with the rest of the consult as if it were an actual consult. P3 also presented something similar regarding her practice.

c. *Face-to-face as a customary mode of practice*. The integration of telemedicine in the customary face-to-face practice was explored by P6; however, hesitancy on the large dependence on telemedicine use remains as also P8 echoes this same sentiment In terms of face-to-face consultation as the standard of practice, P1 explained that it was largely due to the training that current physicians have. Similarly, P6 believes that practice of medicine face-to-face with a patient is the standard of practice.

e. *Looking ahead: telemedicine is here to stay*. The COVID-19 pandemic presented many challenges, but it also forced many changes. P1 acknowledges that, despite the challenges associated with telemedicine, it is a mode of healthcare that should become a permanent fixture in the future.

Discussion

Understanding telemedicine as part of medical practice

A common trend among the physicians interviewed is the lack of awareness with regards to telemedicine prior to the pandemic but in reality, they were already practicing it but were just unaware. Telemedicine has been around in the Philippines since the 1960s, in the form of telephones, beepers, and eventually cellular phones and short messaging systems (SMS).[6] As early as 2008, the University of the Philippines (UP) with the National Telehealth Center (NTHC) was already employing telemedicine through SMS and in 2013, the Philippine government was able to establish an e-health strategic framework.[8]

Efforts made to bridge the gap of telemedicine

A shortage of trained professionals in telehealth in developing countries posed a strain in adapting to the new medium of consultation.[27] The lack of standards in practicing telemedicine was recognized by Picot and emphasized the importance of training healthcare professionals in videoconferencing, remote telemedicine, health information structures, tele-imaging, and home telecare to achieve the minimum competencies of practicing telemedicine.[28]

The importance of training residents was also verbalized by the physicians. This was consistent with the study about the importance of training residents in the use of telepsychiatry which showed that residents who did not receive training needed for virtual consultations are less competent than those who were trained.[29]

Results showed that physicians underwent research and training to learn how to properly conduct telemedicine in their respective practices by attending webinars hosted by local and international universities while others opted for self-learning through reading journals.[11] These virtual consultations did not just affect the physicians and patients, but also the clerical staff members. Data showed that personal secretaries of the participants handled scheduling appointments, rescheduling missed consultations, receiving laboratory results and informed consent, as well as billing of the consultation. This was consistent with the study which showed that clerical staff had to develop new workflows to maintain secretarial work in light with the shift to the digital platform.[30] They were trained to use Zoom to identify and address logistical challenges in patient data encoding using EMR, scheduling, and streamlining communication between providers and staff.

Transitioning to digital consultations did not compromise the confidentiality and autonomy of patients, both of which are essential ethical rights. Some participants in the study required their patients to provide a signed informed consent before any teleconsultation began. This is stressed in another study.[31] This ensured that patients acknowledged and gave consent to the physician to retrieve any essential personal information. This also protected their rights as it included the confidentiality of retrieved data. Some participants in the study did not require a signed informed consent but opted for verbal consent which was consistent with previous study. showing that consent can either be in the oral or written forms under certain circumstances.[32]

Physicians now conduct consultations outside their clinics and inside their homes. Creating a workplace that simulates a set-up similar to a physical consultation sets the professional tone for both physician and patients. Participants of the study chose a private room to avoid background noise that can disrupt the teleconsultation. This was seen in the another study which stated that most telemedicine clinics were likely just converted rooms from already existing rooms that were well-lit, had no background clutter, and no competing sounds.[33]

The virtual patient: navigating medicine without physical contact

Given that physical examination of the patient has been part of the routine medical checkup, the participants expressed that the inability to perform physical examination was a glaring difference and adjustment in adapting to a remote consultation setup. This led to their dependency on the patient's history and results of laboratory tests and imaging. It limited

the data gathered to arrive at a definite diagnosis and subsequently, an appropriate management plan.

As seen in a study where gathered data and medical histories from teleconsultation may be incomplete if totally reliant on the patient's interpretation of their condition.[34] Another study on pediatricians practicing telemedicine were anxious that because they were not being able to perform physical examination, they might fail making an accurate diagnosis.[23]

The physicians also cited the limitation or lack of nonverbal cues as a challenge brought about by the transition to telemedicine. This was also associated with the limitations of physical examination given that observations of certain organ systems are not always accurate even if observed through a video call; more so if based on audio alone. Despite its limitations, teleconsultation done through video calls is the preferred setup of the physicians as it allows them to do a general survey of the patient and observe their body language. Those who do teleconsultations purely through audio calls had expressed difficulty in establishing rapport given the absence of visual cues. Delivering emotional support via phone call was also challenging as it lacked the physical aspect of comforting a patient. This is consistent with the study which found that the lack of physical closeness affected the physicians' ability to perform rituals of care that are essential in building patient-doctor relationship.[35]

To address the limitation of nonverbal communication, the physicians made efforts to ensure that their patients had a clear understanding of their medical advice. This included using media and language that would be best understood by their patients. Another initiative done was summarizing the important points of the teleconsultation by reiterating whatever needed clarification and clearly enunciating the words. As the practice of telemedicine brought the fear that it would not be an effective medium for consultation, necessary adjustments were made to ensure patient understanding of their condition and the management advised.[36]

Despite its limitations or lack of nonverbal cues, teleconsultation done through video calls is the preferred setup of the physicians as it allows them to do a general survey of the patient and observe their body language. Those who do teleconsultations purely through audio calls had expressed difficulty in establishing rapport given the absence of visual cues. Delivering emotional support via phone call was also challenging as it lacked the physical aspect of comforting a patient. To address the limitation of nonverbal communication, the physicians made efforts using media and language that would be best understood by their patients, summarizing the important points of the teleconsultation by reiterating whatever needed clarification and clearly enunciating the words.

Most of the physicians noted that teleconsultations are shorter compared to their usual face to-face encounters as seen in a couple of studies.[35,37] This is due to the limited physical examination and rapport building in teleconsultations. The longer duration of consultation during in-person visits was attributed to the pleasantries exchanged between the physician and patient before and after consultation, which has become less frequent during teleconsultations.

Digital media platforms: telemedicine's tools

A study showed that age played a big factor in digital-divide, wherein older people are more apprehensive in using digital technology.[38] However, results from the current study showed that even participants aged 41-60 were well-adept in using different digital platforms maybe because they use internet in their in their jobs and daily lives to a certain degree.[39] The study saw that it is the low socioeconomic status, that may be a bigger factor than age in digital divide. The choice on which digital platform to use is influenced by physician preferences. Some participants chose platforms based on their familiarity while some decided based on the tool's convenient features. Data revealed that most of the participants used Zoom or Viber, applications that include audiovisual features, for teleconsultation. One study showed that video consultations resulted in greater diagnostic accuracy, fewer medication errors, and reduced readmissions when compared to telephone consultations.[40] Moreover, of current study results showed that patient's limited access to technology prohibited the use of video consultation. Thus, telemedicine was purely conducted through telephone calls. The patient's digital illiteracy or inability to navigate the platforms were also emphasized, explaining the preference of some patients to use telephone instead of video consultations.

Furthermore, data showed that a participant's hospital developed a software program that did not need internet connectivity to aid their telehealth system. The existence of these homegrown programs

coupled with a demographic of non-technologically adept patients pushed participants practicing in public hospitals to use telephone over video consultations as compared to participants in private practice who used platforms with video features for telemedicine. The hospital's telemedicine infrastructure contributed to the choice between telephone and video consultation.[41] Those who practiced in public hospitals used telephone over video consultations as compared to participants in private practice who used platforms with video features for telemedicine. The use of electronic medical records (EMR) has increased with the industry shifting to telehealth. All data seen in a typical medical chart such as patient information, diagnoses, and management were being digitized to allow integration with telehealth.

Unstable connection: different connectivity use in telemedicine

Since most platforms used were online communications applications, having a good internet connection was a necessity for the participants. Internet connectivity problems such as those caused by power outages, unforeseen natural events, or simply weak internet signals posed problems in ensuring that the patients adequately understood the course of the consultation including the diagnosis, management, and instructions. Some physicians used cellular phones in conducting teleconsultations, and thus heavily relied on their mobile network subscriptions. Like with internet use, poor network reception has posed difficulties for physicians in communicating with their patients. As connectivity issues have been unavoidable in the practice of telemedicine, physicians had to learn how to troubleshoot these technical problems such as rescheduling appointments, recalling patients, and asking assistance from one's colleagues when these problems arise. As the pandemic restrictions have left telemedicine as the only alternative to face-to-face consultations, physicians have been given an added responsibility of addressing technical problems in addition to adjusting their usual medical practice for a telemedicine setting.[22]

Crossing the boundaries between work and personal lives

Participants noted a blurring of the lines between home and work, as revealed in the interviews. Examples included working longer hours to manage prescription writing and bringing work-related documents, such as patient charts, home. However, enforcement of personal boundaries may still be difficult or might not come as naturally, as Filipino culture, classified as collectivist, tends to value being self-sacrificing, dependable, generous, and helpful to others. Indeed, many participants, despite the challenge of working out of office hours, ultimately still attended to the calls of the patients.

Acknowledgement of telemedicine as a viable option

Face-to-face consultations are currently the "gold standard" over telemedicine. Additionally, by switching to telemedicine long-term, it may be possible for Filipino healthcare professionals to run into some unaddressed problems inherent to the format. A study outlined at least four: (1) that the long-term consequences of telemedicine (especially with regard to mortality and functional status) are still unknown; (2) that the factors that determine the effectiveness of a telemedicine service or program are still unknown, which may lead to excessive spending; (3) that legislature and similar regulatory guidelines have yet to catch up, which may leave physicians to navigate legal gray areas with little guidance; and (4) that it will ultimately be difficult to build trust and rapport between physician and patient over a screen.[36] This final point in particular is something that has been brought up by participants, who found it difficult to connect with or console patients online.

However, some of the interviewed physicians pointed out that telemedicine is not an alternative to face-to-face consultations, specifically in cases of pregnant, illiterate, and emergency patients. Illiteracy was found to be a hindrance to telemedicine as seen in a study (Parajuli R, Doneys) while being unable to act quickly during emergency situations was the concern of physicians in another study.[21,38] Few studies saw advantages in the use of telemedicine for pregnant patients relating to gestational glycemic control and obstetric COVID-19 patients.[42,43]

The research aimed to address the lack of studies in the Philippines regarding telemedicine, specifically from the physician's point of view. The experiences shared by the interviewed physicians showed an awareness of what telemedicine is, even prior to the pandemic, but recognizing that it is not an alternative but the only viable option to continue

practicing medicine during the pandemic. Efforts were made to prepare for the transition from face-to-face consultations into telemedicine, mainly to bridge the gap of telemedicine. The physician's practice relied on diverse platforms, ranging from voice to video calls and the utilization of EMR, dictated by patient and doctor preferences and their type of practice, may it be public or private. One of the main limitations of telemedicine was the lack of physical contact, which hindered rapport building and physical examination, leading to the shift in reliance on history and diagnostic tests. Unstable internet connection was also a challenge, as frequent troubleshooting became an added responsibility to the physician. Lastly, the predominance of telemedicine has led to the breach in the boundaries of the physician's work and personal life, prompting them to take measures to mitigate patient exploitation.

References

1. Kemp S. Digital 2020: The Philippines - datareportal – global digital insights [Internet]. DataReportal. DataReportal – Global Digital Insights; 2020 [cited 2020 Apr 29]. Available from: https://datareportal.com/reports/digital-2020-philippines
2. Papoutsi E, Giannakoulis VG, Ntella V, Pappa S, Katsaounou P. Global burden of COVID-19 pandemic on healthcare workers. ERJ Open Res 2020 Jul 6;6(2):00195 2020. doi: 10.1183/23120541.00195-2020.
3. Hurst EJ. Evolutions in telemedicine: From smoke signals to mobile health solutions. J Hosp Libr 2016 Apr 2;16(2):174–85.
4. Combi C, Pozzani G, Pozzi G. Telemedicine for developing countries. Appl Clin Inform 2016 Nov 2;7(4):1025–50.
5. Omnibus Guidelines on the Implementation of community quarantine in the Philippines. Official Gazette [Internet]. [cited 2020 April 29] Available from: https://www.officialgazette.gov.ph/downloads/2020/05may/20200429-Omnibus-Guidelines-on-the-Implementation-of-Community-Quarantine-in-the-Philippines.pdf
6. Fernandez-Marcelo PG, Ho BL, Faustorilla JF Jr, Evangelista AL, Pedrena M, Marcelo A. Emerging eHealth directions in the Philippines. Yearb Med Inform. 2012;7:144-52.
7. Adler-Milstein J, Kvedar J, Bates DW. Telehealth among US hospitals: several factors, including state reimbursement and licensure policies, influence adoption. Health Aff (Millwood) 2014 Feb;33(2):207-15. doi: 10.1377/hlthaff.2013.1054.
8. De Castro L, Lopez AA, Hamoy G, Alba KC, Gundayao JC. A fair allocation approach to the ethics of scarce resources in the context of a pandemic: The need to prioritize the worst-off in the Philippines. Dev World Bioeth 2021 Dec; 21(4):153-72. doi: 10.1111/dewb.12293. Epub 2020 Sep 23.
9. Lin CC, Dievler A, Robbins C, Sripipatana A, Quinn M, Nair S. Telehealth in health centers: Key adoption factors, barriers, and opportunities. Health Aff (Millwood). 2018 Dec;37(12):1967-74. doi: 10.1377/hlthaff.2018.05125.
10. Scott Kruse C, Karem P, Shifflett K, Vegi L, Ravi K, Brooks M. Evaluating barriers to adopting telemedicine worldwide: A systematic review. J Telemed Telecare 2018 Jan;24(1):4-12. doi: 10.1177/1357633X16674087. Epub 2016 Oct 16.
11. Isip-Tan IT, Sarmiento F, Fong M, Guzman A, Herber JM, Marcelo A, et al. Telemedicine: guidance for physicians in the Philippines. [Internet] UP College of Medicine – Medicine Information Unit; 2020 [cited 2020 Nov 1]. Available from: https://www.philippinemedicalassociation.org/wp-content/uploads/2020/05/1-Telemedicine-for-Health-Professionals.pdf
12. Department of Health. DOH Boosts Telemedicine Services for NCR; Service to Expand to Other Regions Soon [Internet]. 2020 [cited 2020 Nov 1]. Available from: http://www.doh.gov.ph/doh-press-release/DOH-BOOST-TELEMEDICINE-SERVICES-FOR-NCR-SERVICE-TO-EXPAND-TO-OTHER-REGIONS-SOON
13. WHO Global Observatory for eHealth. Telemedicine: Opportunities and developments in member states: Report on the second global survey on eHealth [Internet]. World Health Organization; 2010 [cited 2020 Nov 1]. Available from: https://apps.who.int/iris/handle/10665/44497
14. Deldar K, Bahaadinbeigy K, Tara SM. Teleconsultation and clinical decision making: a systematic review. Acta Inform Med 2016 Jul 16;24(4): 286-92. doi: 10.5455/aim.2016.24.286-292.
15. Siegel CA. Transforming gastroenterology care with telemedicine. Gastroenterology 2017 Apr;152(5):958-63. doi: 10.1053/j.gastro.2017.01.048. Epub 2017 Feb 10.
16. Mahajan V, Singh T, Azad C. Using telemedicine during the COVID-19 pandemic. Indian Pediatr 2020 Jul 15;57(7):652-7. Epub 2020 May 14.
17. Shamim-Uzzaman QA, Bae CJ, Ehsan Z, et al. The use of telemedicine for the diagnosis and treatment of sleep disorders: an American Academy of Sleep Medicine update. J Clin Sleep Med 2021 May 1;17(5):1103-7. doi: 10.5664/jcsm.9194.
18. Malasanos T, Ramnitz MS. Diabetes clinic at a distance: Telemedicine bridges the gap. Diabetes Spectr 2013;26(4):226–31. doi: 10.2337/diaspect.26.4.226
19. Flodgren G, Rachas A, Farmer AJ, Inzitari M, Shepperd S. Interactive telemedicine: effects on professional practice and health care outcomes. Cochrane Database Syst Rev 2015 Sep 7;2015(9):CD002098. doi: 10.1002/14651858.CD002098.pub2.
20. Downes MJ, Mervin MC, Byrnes JM, Scuffham PA. Telemedicine for general practice: a systematic review protocol. Syst Rev 2015 Oct 5;4:134. doi: 10.1186/s13643-015-0115-2.
21. Parajuli R, Doneys P. Exploring the role of telemedicine in improving access to healthcare services by women and girls in rural Nepal. Telemat Inform 2017;34(7):1166–76. doi: 10.1016/j.tele.2017.05.006.

22. Kadir MA. Role of telemedicine in healthcare during COVID-19 pandemic in developing countries. TMT [Internet]. 2020 Apr 30 [cited 2020 Nov 5];5(2). Available from: https://telehealthandmedicinetoday. com/index. php/journal /article/view/187
23. Ohannessian R, Duong TA, Odone A. Global telemedicine implementation and integration within health systems to fight the COVID-19 pandemic: A call to action. JMIR Public Health Surveill 2020;6(2):e18810. URL: https:// publichealth.jmir.org/2020/2/e18810. doi: 10.2196/18810
24. Koonin LM, Hoots B, Tsang CA, et al. Trends in the use of telehealth during the emergence of the COVID-19 pandemic - United States, January-March 2020. Morb Mortal Wkly Rep 2020 Oct 30;69(43):1595-9. doi: 10.15585/mmwr.mm6943a3. Erratum in: Morb Mortal Wkly Rep. 2020 Nov 13;69(45):1711.
25. Willems LM, Balcik Y, Noda AH, et al. SARS-CoV-2-related rapid reorganization of an epilepsy outpatient clinic from personal appointments to telemedicine services: A German single-center experience. Epilepsy Behav 2020 Nov;112:107483. doi: 10.1016/j.yebeh.2020.107483. Epub 2020 Oct 6.
26. Braun V, Clarke V. Using thematic analysis in psychology. Qual Res Psychol 2006;3(2):77-101.
27. Scott RE, Mars M. Telehealth in the developing world: current status and future prospects. Smart Homecare Technology and Telehealth 2015 Feb 2; 3: 25-37. doi: 10.2147/SHTT.S75184
28. Picot J. Meeting the need for educational standards in the practice of telemedicine and telehealth. J Telemed Telecare 2000;6 Suppl 2:S59-62. doi: 10.1258/1357633001935608.
29. Saeed SA, Johnson TL, Bagga M, Glass O. Training residents in the use of telepsychiatry: Review of the literature and a proposed elective. Psychiatr Q 2017 Jun; 88(2):271-283. doi: 10.1007/s11126-016-9470-y.
30. Barney A, Buckelew S, Mesheriakova V, Raymond-Flesch M. The COVID-19 pandemic and rapid implementation of adolescent and young adult telemedicine: Challenges and opportunities for innovation. J Adolesc Health 2020 Aug;67(2):164-71. doi: 10.1016/j.jadohealth.2020.05.006. Epub 2020 May 14.
31. Nittari G, Khuman R, Baldoni S, et al. Telemedicine practice: Review of the current ethical and legal challenges. Telemed J E Health 2020 Dec;26(12):1427-37. doi: 10.1089/tmj.2019.0158. Epub 2020 Feb 12.
32. Kotsopoulou A, Melis A, Koutsompou VI, Karasarlidou C E-therapy: The ethics behind the process. Procedia Comput Sci 2015;65:492–9. doi: 10.1016/j.procs.2015.09.120
33. Krupinski EA. Telemedicine workplace environments: Designing for success. Healthcare (Basel) 2014 Feb 24;2(1):115-22. doi: 10.3390/healthcare2010115.
34. Colbert GB, Venegas-Vera AV, Lerma EV. Utility of telemedicine in the COVID-19 era. Rev Cardiovasc Med 2020 Dec 30;21(4):583-7. doi: 10.31083/j.rcm.2020.04.188.
35. Gomez T, Anaya YB, Shih KJ, Tarn DM. A qualitative study of primary care physicians' experiences with telemedicine during COVID-19. J Am Board Fam Med 2021 Feb;34(Suppl):S61-S70. doi: 10.3122/jabfm.2021. S1.200517.
36. Kahn JM. Virtual visits--confronting the challenges of telemedicine. N Engl J Med 2015 Apr 30;372(18):1684-5. doi: 10.1056/NEJMp1500533.
37. Ananthakrishnan AN, Singh S. The doctor will call you now! Telemedicine in the midst of a pandemic. Clin Gastroenterol Hepatol 2020 Jul;18(8):1688-90. doi: 10.1016/j.cgh.2020.04.031. Epub 2020 Apr 18.
38. Quimba FMA, Calizo SC. Going digital: From innovation to inclusive growth in the Philippines. PIDS Discussion Paper Series [Internet]. 2018 Nov; [cited 2020 Apr 29], Available from: https://pidswebs.pids.gov.ph/CDN/ PUBLICATIONS/pidsdps1819.pdf
39. Paul G, Stegbauer C. Is the digital divide between young and elderly people increasing? First Monday 2005 Oct 3;10(10). doi: 10.5210/fm.v10i10.1286
40. Rush KL, Howlett L, Munro A, Burton L. Videoconference compared to telephone in healthcare delivery: A systematic review. Int J Med Inform 2018 Oct;118:44-53. doi: 10.1016/j.ijmedinf.2018.07.007. Epub 2018 Jul 25.
41. Rodriguez JA, Betancourt JR, Sequist TD, Ganguli I. Differences in the use of telephone and video telemedicine visits during the COVID-19 pandemic. Am J Manag Care 2021 Jan;27(1):21-6. doi: 10.37765/ajmc.2021.88573.
42. Chilelli NC, Dalfrà MG, Lapolla A. The emerging role of telemedicine in managing glycemic control and psychobehavioral aspects of pregnancy complicated by diabetes. Int J Telemed Appl 2014; 621384. doi: 10.1155/2014/621384. Epub 2014 Sep 10.
43. Reforma LG, Duffy C, Collier AY, et al. A multidisciplinary telemedicine model for management of coronavirus disease 2019 (COVID-19) in obstetrical patients. Am J Obstet Gynecol MFM 2020 Nov;2(4):100180. doi: 10.1016/j.ajogmf.2020.100180. Epub 2020 Jul 25.

Relationship of trust on selected health information sources and COVID-19 vaccine acceptance among older adults

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Abstract

Introduction In order to suppress the COVID-19 virus, several vaccines have been developed. The administration of COVID-19 vaccines entails its acceptance. However, misinformation and vaccine uncertainty are main factors that affect vaccine acceptance. This study aimed to determine the most trusted health information source, the most frequently accessed health information source, and health literacy of older adults within Metro Manila.

Methods This study employed a quantitative non-experimental design utilizing correlational and descriptive approaches. Convenience sampling was utilized via Facebook to recruit participants. The survey was adapted from four different questionnaires and went through reliability testing and expert validation.

Results The researchers collected responses from a total of 123 participants. The participants were noted to have an overall high level of acceptance for the COVID-19 vaccine ($\overline{x}$4.10, SD ± 0.22).

The study revealed that doctors were the highly trusted health information source (($\overline{x}$ =3.69, SD ± 1.30), followed by government health agencies (($\overline{x}$ =3.18, SD ± 0.73), whereas religious organizations and leaders (($\overline{x}$ =2.45, SD ± 0.48) were the least trusted sources. However, despite being the least trusted source, religious organizations and leaders were shown to be positively related (p=0.049) and highly predictive of COVID-19 vaccine acceptance. The most frequently accessed health information source, health workers, have a weak correlation (r=.323) and were found to be significantly positively related (p=0.008) and highly predictive of the acceptance of the COVID-19 vaccine. The credibility of health information sources is likely to influence their selection, influencing decisions and behaviors.

Key words: SARS-CoV-2, vaccine acceptance, health information sources, older adults, gerontology nursing

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Globally, the COVID-19 pandemic is rising morbidity and mortality rates, particularly in Southeast Asian countries such as the Philippines. Several COVID-19 vaccines surfaced to prevent further infections. Despite the vaccine's scientific backing and rapid answer to the world health crisis, some people remain skeptical. According to a local study, some people are hesitant to obtain the COVID-19 vaccine because they are concerned about its safety and efficacy.[1] Misinformation and uncertainty of vaccines are the main factors that affect an individual's vaccine acceptance in the Philippines. According to WHO

Philippines (2021), in spite of the progress in other priority groups, vaccination rates among older adults in the Philippines remain low, with only around 25% fully vaccinated and only about 35% receiving their first dose.[2] This underscores the rationale behind the researchers' decision to focus on older adults as their target population. Limited studies have been conducted that identify whether a significant relationship exists between trust on health information sources and COVID-19 vaccine acceptance. Moreover, studies have yet to be conducted to discover whether there is a significant relationship with the most frequently accessed health information sources and COVID-19 vaccine acceptance.

Trust comprises different concepts and domains which affect the individuals' decision regarding vaccine acceptance. An individual's trust in their government, health information sources, and the vaccine itself are some of the factors that affect their vaccine acceptance as shown in previous studies.[3,4] A study found out that individual drivers of vaccine adoption include faith in national health authorities, scientists, and personal health concerns, according to predictors.[3] On the other hand, one study claimed that people use the trustworthiness of health sources as a fundamental strategy of settling issues, and confidence in authorities is a multi-component construct.[4] These insights are essential to public health which can potentially increase vaccine acceptance. Specifically, both literatures concluded that high levels of trust can be correlated with positive outcomes which include higher vaccination rates. While favorable results were previously mentioned, negative outcomes may also exist, as demonstrated by lesser perceived danger risks. A nonlinear relationship was recorded in the results involving generalized trust as well as possibility of vaccine acceptance another study.[5] However, there is a strong linear relationship between vaccination acceptance and trust in the vaccine, its production and process, and trust in information sources, indicating that these variables have an impact on an individual's vaccine acceptance. Furthermore, the findings of the aforementioned study indicate that the active participation of public health organizations, press entities, and political leaders plays a crucial role in bolstering trust in COVID-19 vaccination. This aligns with the conclusions drawn by other studies.[3,4]

Literature from studies conducted abroad showed that among the older population, the primary health information source utilized was the internet, followed by health care professionals, traditional media, and family and friends and a smorgasbord approach, which is a combination of sources.[6] Personal testimony from immunized families and friends regarding their experiences were also recognized as a reliable source of information by another study.[7] People with lower health literacy are inclined to place less trust in medical sources, while they are more likely to trust social media and other outlets. Consequently, social media can be employed as a tool to enhance health literacy and build trust in health-related sources. On the other hand, vaccine acceptance encompasses a variety of attitudes and behaviors, from outright rejection of all vaccines to full endorsement and compliance with recommendations of immunization.[8]

However, there are studies done overseas that showed no difference in vaccine acceptance among different age groups.[9,10] Vaccine acceptance is multifactorial and can change over time. One's willingness to get vaccinated may not be a good predictor of acceptance. Attitudes and beliefs towards vaccination, perceived risk or severity of disease or vaccine, personal health concerns, and vaccine characteristics are the factors noted in a study conducted on West European and North American societies.[11] Research conducted in Australia, as well as the study in the UK, revealed minimal reluctance toward COVID-19 vaccination.[12,13] Therefore, the study aimed to determine the most trusted health information source, the most frequently accessed health information source, the health literacy level, and the level of vaccine acceptance among older adults within Metro Manila.

Methods

This study employed a quantitative design utilizing correlational and descriptive approaches to understand whether trust on health information sources and the sources themselves have a relationship with COVID-19 vaccine acceptance. The study's target population were older adults aged 60 years old and above, residing within Metro Manila, Philippines. The selection of participants was carried out through a convenience sampling method utilizing Facebook. The researchers employed a bilingual online questionnaire that underwent testing for both reliability and expert validation.

Descriptive statistics were performed. Pearson's r was done to examine if the level of trust towards health information sources is related to COVID-19

vaccine acceptance among older adults within Metro Manila as well as between the most frequently accessed health information sources and COVID-19 vaccine acceptance among older adults. The researchers also performed regression analysis to determine the trusted information sources and most frequently accessed information sources that are most predictive of COVID-19 vaccine acceptance. Statistical analysis was done using SPSS.

Results

Trust in health information sources

The researchers calculated the weighted mean for each scale, consisting of six questions related to the level of trust in five choices: doctors, government health agencies, family or friends, charitable organizations, and religious organizations and leaders. Doctors received a very high level of trust, while government health agencies, family and friends, and charitable organizations were rated with a high level of trust by the participants. However, religious organizations and leaders received a low level of trust (Table 1) .

Frequency of use of health information sources

Regarding the most frequently accessed health information sources, participants reported a weighted mean of 4.13 (SD ± 0.45) for mass media health information sources, suggesting occasional access (approximately 1 time per 15 days). Interpersonal health information sources scored 4.07 (SD ± 0.41), also indicating occasional access (around 1 time per 15 days). Official health information sources received a score of 2.67 (SD ± 0.19), suggesting infrequent access (approximately 1 time per 2 months).

Health literacy

Health literacy status among older adults was measured through a 5-point Likert scale. The overall health literacy status was expressed through their weighted means. Overall, the results show an overall health literacy level of 3.64 (SD ± 0.67) indicating an overall high literacy level.

COVID-19 vaccine acceptance

The participants had an overall weighted mean of 4.10 (SD ± 0.22) indicating an overall high level of acceptance for the COVID-19 vaccine. Correlation analysis between trust in health information sources, and COVID-19 vaccine acceptance is shown in Table 2. The results indicated that religious and organization leaders are significantly positively related to vaccine acceptance (p=0.049), displaying a very weak correlation (r=.190). Most frequently accessed health information sources, and COVID-19 vaccine acceptance was also correlated. Results showed that news websites and/or valid websites have a weak correlation (r=.258) and a significantly positive relationship with vaccine acceptance (p=.006), the internet (e.g. general blogs, personal pages) has a weak correlation (r=.229) and a significantly positive relationship (p=.015), and that health workers (e.g. nurses, pharmacists) also have a weak correlation (r=.323) and a significantly positive relationship (p=.001) with vaccine acceptance.

Table 1. Weighted means and SDs among the study variables.

Variable	Overall Weighted Mean	SD	Verbal Interpretation
Trust Level Health Information Sources			
Doctor	3.69	± 1.30	Very High Level of Trust
Government Health Agencies	3.18	± 0.73	High Level of Trust
Family or Friends	2.99	± 0.73	High Level of Trust
Charitable Organizations	2.60	± 0.59	High Level of Trust
Religious Organizations and Leaders	2.45	± 0.48	Low Level of Trust
Most Frequently Accessed Health Information Sources			
Mass Media Information Sources	4.13	± 0.45	Sometimes (1 time per 15 days)
Interpersonal Information Sources	4.07	± 0.41	Sometimes (1 time per 15 days)
Official Information Sources	2.67	± 0.19	Rarely (1 time per 2 months)
Health Literacy	3.64	± 0.67	High Literacy
Vaccine Acceptance	4.10	± 0.22	High Level of Acceptance

Table 2. Correlation analysis between level of trust towards health information sources, most frequently accessed health information sources and COVID-19 acceptance.

Variable	r	*p*-value
Level of trust		
Doctor	.144	.138
Family or friends	-.077	.430
Government health agencies	.121	.212
Charitable Organization	.129	.183
* Religious organizations and leaders	.190	.049
Most frequently accessed health information source		
Newspaper/Magazines	.128	.178
Radio	-.065	.493
Television	.095	.321
Electronic press (e.g. electronic newspapers)	.150	.113
* News websites and/or valid websites	.258	.006
* Internet (e.g. general blogs, personal pages) Social networks (e.g.	.229	.015
Facebook, Twitter, Instagram, YouTube, etc.)	.149	.115
Personal doctor		
* Health workers (e.g. Nurses, Pharmacists)	.155	.102
Family	.323	.001
Friends	.096	.314
Department of Health	.097	.308
European C.D.C	.066	.495
World Health Organization (WHO)	-.105	.281
Scientific journals	.000	.996
Open electronic, digital libraries	-.092	.331
Libraries that offer information on COVID-19	.067	.483
	-.023	.814

**Correlation is significant at the 0.05 level (2-tailed).*

Table 3. Regression analysis of predictors of COVID-19 vaccine acceptance.

	t	*p*	*β*	*F*	*Sig.*	adj. *R*
Trust in health information sources				2.420	.041b	.063
A doctor	1.120	.266	.119			
Family or Friends	-.663	.509	-.073			
Government Health Agencies	.671	.504	.077			
Charitable Organizations	1.788	.077	.196			
* Religious Organizations and Leaders	-2.369	.020	-.263			
Most frequently accessed health information sources				2.298	.006b	.176
Newspapers/magazines (printed press)	1.264	.210	.140			
Radio	-.783	.436	-.096			
Television	.227	.821	.029			
Electronic press	-.443	.659	-.070			
News websites and/or valid websites	1.806	.074	.300			
Internet	.750	.455	.127			
Social networks	-.674	.502	-.099			
Personal doctor	-.970	.335	-.165			
* Health workers	2.730	.008	.419			
Family	.688	.493	.112			
Friends	-.193	.847	-.033			
Department of Health	.415	.679	.055			
European CDC	-.731	.467	-.119			
World Health Organization (WHO)	-.386	.700	-.061			
Scientific journals	-1.513	.134	-.290			
Open electronic, digital libraries	1.216	.227	.212			
Libraries that offer information on COVID-19	-1.055	.295	-.176			

** significantly associated*

Table 3 shows the regression analysis of predictors of COVID-19 vaccine acceptance. That the most frequently accessed health information sources and COVID-19 vaccine acceptance showed health workers have a weak correlation (r=.323) and is significantly positively associated (p=0.008) with and also highly predictive of COVID-19 vaccine acceptance.

Discussion

The study revealed that doctors were the highly trusted health information source, followed by government health agencies, and religious organizations and leaders were the least trusted sources. According to one study, health experts are sources of trustworthy information about vaccines justifying the results of having a very high level of trust towards doctors.[3] Similar results were evident in one study wherein the most utilized health information sources were providers (e.g., doctor, nurse, social worker) and the internet (independent use).[6] In the study, newspaper/ magazines, radio, television, electronic press (e.g. electronic newspapers), social networks (e.g. Facebook, Twitter, Instagram, YouTube, etc.), personal doctor, family, friends, the Department of Health, European C.D.C, the World Health Organization (WHO), scientific journals, digital libraries, and libraries that offer information on COVID-19 did not have significant relationships with vaccine acceptance, with very weak correlations as well. Despite being the most trusted source, doctors have not shown to influence the decisions of the participants in choosing to accept a vaccine. People's decisions with vaccination were heavily influenced by cultures that sprung from shared beliefs about disease etiology, safety and efficacy of vaccines as well as encounters with local health services and vaccination settings. In the aftermath of the COVID-19 outbreak, older adults are more reliant on local government to cover their healthcare needs because they have fewer resources than the other age groups. It can be concluded that older adults may have difficulty using different gadgets to seek health information, are unable to communicate with their families on a regular basis or lack sufficient understanding of where to acquire health information. Despite being the least trusted source, religious organizations and leaders were shown to be positively related to vaccine acceptance with a seemingly weak correlation. The authors could not directly discern if exposures to messages from government health organizations and religious leaders had such positive relationships with the outcome because they are least trusted sources, but these two have traditionally played an important role in influencing public perception to vaccine acceptance. A study based on the African American community, where faith is of importance, has identified religious and faith leaders as crucial figures in mobilizing and encouraging communities to get vaccinated against the COVID-19 virus.[14]. In the local context, a study argued that the Catholic Church, being an influential institution in the Philippines, can also establish trust and increase acceptance among Filipinos.[15] The Department of Health has acknowledged the importance of having different sectors endorse the vaccine, and it is highly suggested that a partnership between the Church and the government be formed to boost the vaccine uptakes within the country.[15]

Interestingly, the most frequently approached health information sources, was not necessarily perceived as the most trustworthy ones. Television has been one of the most frequently accessed mass media sources of information. One possible cause is that older adults generally have lower responsiveness, which makes keeping up with fast-paced technology more difficult. Considering also that older adults have a higher risk of acquiring the virus, they have been unable to consult their personal doctors and have instead depended on government pronouncements or television coverage. Families and friends were some of the highly trusted and frequently accessed interpersonal health information sources of the participants. This finding emphasizes the role of personal testimonies of vaccination experiences in informing public health messaging campaigns to increase vaccine uptake. One study showed that vaccine hesitancy was strongly related to vaccination behavior.[16] Families who refused vaccination are concerned about the long-term health problems caused by the vaccination and vaccine safety. Overall, when it comes to the frequency of use of health information sources, mass media and interpersonal health information sources are preferred over official health information sources. People actively seek or search for health information. Health information plays an essential role in health promotion by influencing individuals' health behavior adaptation and decision making. As they cope with anxiety and fear, people may choose to share COVID-19

information from the news media, social media, and family.[17]

In addition to being in a COVID-19 pandemic, people are also living with an "infodemic" where there is a widespread amount of false and misleading information circulating the digital platform especially on Social Networking sites. In contrast to the results of the study, local research has suggested how prevalent poor health literacy is among Filipinos. Based on a study that was conducted among selected Filipino adults aged 50-70 years old, 93.8% of the participants had inadequate health literacy levels.[18] This should be considered as a public health "issue" especially since people who fall within the age group of 50 years and above comprise the high-risk population and are more vulnerable to the COVID-19 virus. Having adequate and good health literacy levels are important for individuals to be able to understand health information and judge whether information coming from different sources are to be considered.

The participants had an overall high level of acceptance for the COVID-19 vaccine. This outcome suggests that older adults recognize the benefits of safeguarding themselves against the virus through COVID-19 vaccination. Given the right information from the right sources, older adults were likely to accept COVID-19 vaccines as supported by the findings of a study which identified the factors that influenced the individuals' acceptance as trust in their national health authorities and personal health concerns.[3] On the other hand, vaccine efficacy, vaccine safety, and risk of infection are among the reasons for low vaccine acceptance according to a scoping review of 22 studies.[19]

Conclusion

Vaccine acceptance of the elderly population in the Philippines remained low as of 2021. Factors that influenced the population's vaccine acceptance include the desire to return to previous ways of living and protect their loved ones from cross-infection. Results revealed that religious and organization leaders are significantly positively related to vaccine acceptance ($p=0.49$). To further support this, regression analysis of the level of trust in health information sources and COVID-19 vaccine acceptance showed that religious organizations and leaders had the only significantly positive relationship ($p=0.020$) and are highly predictive of vaccine acceptance. Religious leaders play a significant role in promoting vaccine acceptance by having a great influence among their church members. As members of the church, older adults are likely to support the views and stand of their religious leaders on critical matters, like vaccine acceptance. A separate regression analysis of most frequently accessed health information sources and COVID-19 vaccine acceptance showed health workers have a weak correlation ($r=.323$) and is significantly positively associated ($p=0.008$) with and are also highly predictive of COVID-19 vaccine acceptance.

Limitations and Future Studies

A convenience sampling method was distributed through Facebook where the population was limited to those who only had access to this platform. Furthermore, the study did not investigate the impact of health literacy on the ability of the respondents to choose health information sources, and how this can also further impact COVID-19 vaccine acceptance. The possibility of common method bias is also considered since the instrument utilized can introduce this where data sources were only obtained from the respondents which are self-reported. Another limitation is that the study only investigated trust on five health information sources, where the study failed to discover the trust ratings on other existing health information sources. Future research is recommended to employ a mixed methods approach to fully capture the COVID-19 vaccine acceptance of the chosen population. Lastly, future researchers may also assess the occupational status of families and friends as health information sources, considering that there may be a possibility for them to be healthcare workers, which can further influence the study's results.

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References

1. Bautista AP, Bleza DG, Balibrea DM, Equiza C. Acceptability of vaccination against COVID-19 among selected residents of the cities of Caloocan, Malabon, and Navotas, Philippines. Preprints [Internet] 2021, 2021040702 (doi: 10.20944/preprints202104.0702.v1).
2. World Health Organization. WHO Philippines expresses concern at the low COVID-19 vaccination rate among senior citizens in some LGUs amid rising threat from new variants. World Health Organization. 2021. Available from: https://www.who.int/philippines/news/detail/30-07-2021-who-philippines-expresses-concern-at-the-low-covid-19-vaccination-rate-among-senior-citizens-in-some-lgus-amid-rising-threat-from-new-variants
3. Lindholdt MF, Jørgensen F, Bor A, et al. Public acceptance of COVID-19 vaccines: Cross-national evidence on levels and individual-level predictors using observational data. BMJ Open 2021; 11: e048172. doi: 10.1136/bmjopen-2020-048172
4. Sopory P, Novak JM, Day AM, et al. Trust and public health emergency events: A mixed-methods systematic review. Disaster Medicine and Public Health Preparedness [Internet] 2022; 16(4): 1653-73. doi: 10.1017/dmp.2021.105
5. Szilagyi PG, Thomas K, Shah MD, et al. The role of trust in the likelihood of receiving a COVID-19 vaccine: Results from a national survey. Preventive Medicine [Internet] 2021 Jan; 153: 106727. Available from: https://doi.org/10.1016/j.ypmed.2021.106727
6. Turner AM, Osterhage KP, Taylor JO, Hartzler AL, Demiris G. A closer look at health information seeking by older adults and involved family and friends: Design considerations for health information technologies. AMIA Annual Symposium Proceedings. AMIA Symposium 2018; 1036–45.
7. Purvis RS, Hallgren E, Moore RA, et al. Trusted sources of COVID-19 vaccine information among hesitant adopters in the United States. Vaccines [Internet] 2021; 9(12): 1418. Available from: http://dx.doi.org/10.3390/vaccines9121418
8. Feemster KA. Overview: Special focus vaccine acceptance. Human Vaccines & Immunotherapeutics [Internet] 2013; 9(8): 1752–4. Available from: https://doi.org/10.4161/hv.26217
9. Dror AA, Eisenbach N, Taiber S, Morozov NG, Mizrachi M, Zigron A, Srouji S, Sela E. Vaccine hesitancy: The next challenge in the fight against COVID-19. Eur J Epidemiol [Internet] 2020 Aug; 35(8): 775-9. doi: 10.1007/s10654-020-00671-y
10. Wong LP, Alias H, Wong PF, Lee HY, AbuBakar S. The use of the health belief model to assess predictors of intent to receive the COVID-19 vaccine and willingness to pay. Human Vaccines & Immunotherapeutics [Internet] 2020; 16(9): 2204–14. Available from: https://doi.org/10.1080/21645515.2020.1790279
11. Eilers R, Krabbe PFM, de Melker HE. Factors affecting the uptake of vaccination by the elderly in Western society. Preventive Medicine [Internet] 2014 Dec; 69: 224-34. Available form: https://www.sciencedirect.com/science/article/abs/pii/S0091743514003818
12. Aitken Z, Emerson E, Kavanagh A. COVID-19 vaccination coverage and hesitancy among groups prioritised in Australia's vaccine rollout. MedRxiv [Internet] 2022. Available from: https://doi.org/https://doi.org/10.1101/2021.08.05.21261633
13. Robertson E, Reeve KS, Niedzwiedz CL, et al. Predictors of COVID-19 vaccine hesitancy in the UK household longitudinal study. Brain, Behavior, and Immunity [Internet] 2021 Mar; 94: 41–50. Available from: https://doi.org/10.1016/j.bbi.2021.03.008
14. Privor-Dumm L, King T. Community-based strategies to engage pastors can help address vaccine hesitancy and health disparities in black communities. J Health Commun [Internet] 2020 Oct 2; 25(10): 827-30. doi: 10.1080/10810730.2021.1873463
15. Gopez JMW. Building public trust in COVID-19 vaccines through the Catholic Church in the Philippines. J Public Health (Oxf) [Internet] 2021 Jun 7; 43(2): e330-e331. doi: 10.1093/pubmed/fdab036
16. Chen H, Li X, Gao J, et al. Health belief model perspective on the control of COVID-19 vaccine hesitancy and the promotion of vaccination in China: Web-based cross-sectional study. J Med Internet Res [Internet] 2021 Sep; 23(9): e29329. doi: 10.2196/29329
17. Lu L, Liu J, Yuan YC, Burns KS, Lu E, Li D. Source trust and COVID-19 information sharing: The mediating roles of emotions and beliefs about sharing. Health Educ Behav [Internet] 2021 Apr; 48(2): 132-9. doi: 10.1177/1090198120984760
18. Agosto HGC, Briones MVA, Palatino MC. Correlates of health literacy among Filipinos aged 50-70 years old belonging to low-income families in a selected community. Acta Med Philipp [Internet] 2018 May 31; 52(3). Available from: https://actamedicaphilippina.upm.edu.ph/index.php/acta/article/view/397
19. Joshi A, Kaur M, Kaur R, Grover A, Nash D, El-Mohandes A. Predictors of COVID-19 vaccine acceptance, intention, and hesitancy: A scoping review. Front Public Health [Internet] 2021 Aug 13; 9: 698111. doi: 10.3389/fpubh.2021.698111

Self-reported confidence in general competencies and skills of clinical clerks of a private medical school for SY 2021-2022: A cross-sectional study

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Abstract

Introduction During the COVID-19 pandemic, medical schools shifted to blended learning. This study aimed to determine the demographic and level of confidence of a private medical school's clinical clerks of School Year 2021-2022 on general competencies and skills.

Methods The study aimed to identify the skills that exhibited the highest and lowest levels of confidence among a group of 139 clinical clerks. Additionally, it sought to examine whether there were significant differences in confidence levels based on sex and prior clinical experience. An analytical cross-sectional study design was employed using a Google Form as the data collection tool.

Results The clerks were most confident in handwashing, and least in NGT insertion, performing digital rectal examination (DRE), and suturing. Females were more confident in history taking of obstetric and gynecologic, surgical, and medical patients, physical examination of pediatric patients, and preparing a discharge summary, while males were more confident in performing digital rectal examination. Clerks with prior medical experience were significantly more confident in foley catheter insertion, intravenous insertion, blood extraction, suturing, and performing essential intrapartum and newborn care (EINC) than those without. The results aligned with previous studies since clerks with prior experience were able to practice the skills in a psychomotor sense.

Conclusion The study revealed significant differences in the confidence level on the competencies and skills for medical practice between sex and prior medical experience.

Key words: clinical clerks, confidence, general competencies, clinical skills

When the COVID-19 pandemic hit the Philippines in March 2020, medical schools shifted to online learning and blended learning which allowed students to obtain technical skills-training using online didactics.[1] Online learning was not common in most medical universities in the Philippines prior to the pandemic and medical students acquired their clinical skills in an actual face to face hospital setting. The medical education leading to the degree of Doctor of Medicine is a four-year program with three years studying the basic sciences and basic clinical skills and the remaining year devoted to clinical training in the

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hospital setting where the clerks are supposed to apply their basic science and clinical subjects' knowledge to actual patients. A study found that students' self-perceived confidence improved significantly after two clinical years of the medical course.[2] The traditional learning set-up is ideal for the acquisition and improvement of clinical skills. Although perceived confidence does not necessarily correlate with clinical competency, it can indicate a clinical clerk's ability to perform these clinical skills and participate in clinical activities. It is essential to recognize that perceived confidence may not always directly correlate with clinical competency. However, it can provide valuable insights into a clinical clerk's willingness and readiness to perform various clinical skills and actively engage in clinical activities.

Notably, previous studies have revealed that approximately 80% of Filipino medical students expressed concerns about the limitations of online learning in developing certain clinical skills. They felt that some essential clinical experiences, such as delivering a newborn, assisting in a trauma laparotomy, or managing a patient with diabetic ketoacidosis from admission, cannot be fully replicated through online educational platforms.[1] After almost two years of utilizing an online or blended set-up in Philippine medical schools, it is not yet known exactly which clinical skills students could perform with more confidence. It is particularly important to obtain these data because clinical clerks are in their final year of their medical education and they are expected to have gained enough knowledge and confidence in performing basic clinical skills, so that they can practice as general practitioners after graduation.

The study aimed to determine the demographic characteristics and level of self-reported confidence of the clinical clerks of School Year 2021-2022 on general competencies and skills regarding (a) history taking, (b) physical examination, (c) hospital report, (d) hospital documentation, (e) hospital safety protocol, (f) nasogastric tube insertion, (g) foley catheter insertion, (h) intravenous access insertion, (i) blood extraction, (j) bag-valve-mask ventilation, (k) digital rectal examination, (l) suturing, (m) wound care, (n) immunization of a pediatric patient, and (o) Essential Intrapartum and Newborn Care (EINC).

Methods

The study utilized an analytical cross-sectional study design. Convenience sampling was done. The inclusion criteria included (1) a clinical clerk who was enrolled during the S.Y. 2021-2022, and (2) underwent blended-online and face-to-face hospital duties during clinical clerkship. The exclusion criteria included those diagnosed with any mental health disorder six months prior to the start of the clerkship. Data collection was done two to three months after the clinical clerks finished clerkship.

A minimum of 138 participants was needed from the total population of 397 students for the study. The sample size was estimated using the formula for the estimation of the population mean obtained from a previous study.[3]

Clinical skills are defined as skills identified and are adapted from the school's 4th year students' Competencies and Skills Achievement Report in-hospital Clinical Rotation. Prior Medical Experience was defined as those students who had previous experience in providing face-to-face health care services/patient care before start of clerkship (hospital/clinic duties, medical mission, internship, worked part-time/full-time in a hospital, etc). Science courses are defined as a Bachelor of Science degree, while non-science courses are defined as a Bachelor of Arts degree.

Google Forms were used in the data collection. Invitation to the online survey was disseminated to all clinical clerks of A.Y. 2021-2022 through a post in the batch's online group forum.

Information on the socio-demographic characteristics of participants (i.e., age, sex, premedical course, and prior clinical experience in healthcare) and self-reported confidence ranked on a 5-point Likert scale was gathered. The following competencies and skills were assessed: (1) history taking (i.e medical patient, surgical patient, neurology patient, OBGYNE patient, pediatric patient), (2) physical examination (i.e medical patient, surgical patient, neurology patient, OBGYNE patient, pediatric patient), (3) initial summary and complete database, (4) discharge summary, (5) giving of discharge instructions and prescriptions, (6) hospital safety protocols (i.e. proper donning and doffing, proper handwashing), (7) nasogastric tube insertion, (8) foley catheter insertion, (9) intravenous access insertion, (10) blood extraction, (11) bag-valve-mask ventilation, (12) digital rectal examination, (13) suturing, (14) wound care, (15) immunization of a pediatric patient, and (16) Essential Intrapartum and Newborn Care.

The data collected from Google Forms were extracted and checked for completeness of entry. Data were analyzed using SPSS version 25 (IBM, NY, USA) at a significance level set at α=0.05. Descriptive statistics (frequency and percentages) were used to examine the demographic characteristics of the study population. Frequency and median were used for the identification of level of self-reported confidence and determination of competency and skill with highest and lowest levels. Mann Whitney U Test was used to determine whether there is a significant difference in the self-reported confidence between (a) sexes and (b) prior medical experience. Additionally, the differences were obtained between the self-reported confidence between sexes and those with and without prior medical experience.

Results

A total of 139 participants responded to the survey, and their corresponding sociodemographic profile is shown in Table 1. The results indicate that the population consisted of more females (68.3%) than males (31.7%). Among the participants, 132 (95.0%) were clerks who had undergone a science-based premedical course, and out of those, 90 (64.7%) had prior medical experience. The median self-confidence ratings for each general competency and skill range from 2 to 5. Nasogastric tube insertion, performing a digital rectal examination, and suturing have the lowest median score of 2. Skills with a median score of 3 encompass the physical examination of surgical, neurology, obstetric and gynecologic, and pediatric patients, along with foley catheter insertion, intravenous access insertion, bag-valve ventilation procedure and wound care.

Table 1. Summary of Sociodemographic profile of the respondents.

Characteristics	Frequency	Relative frequency (%)
Sex		
Male	44	31.7
Female	95	68.3
Premedical course		
Science	132	95.0
Non-science	7	5.0
With experience in healthcare prior to medical school		
Yes	90	64.7
No	49	35.3

Skills rated with a median of 4 include history taking of medical and surgical patients, physical examination of medical, surgical, neurology, obstetric and gynecologic, and pediatric patients, as well as preparing an initial summary and complete database, discharge summary, providing discharge instructions and prescriptions, proper donning and doffing, performing a blood extraction, immunization of a pediatric patient, and practicing EINC. Finally, the skill with the highest median score (5) is proper handwashing (Table 2).

There is a significant difference between the level of confidence of males and females, with females having a significantly higher confidence in the history taking of: an obstetric and/or gynecologic patient (p=0.001), a surgical patient (p=0.009), and a medical patient (p=0.022), as well as the performance of a digital rectal examination (p=0.004), physical examination of pediatric patient (p=0.049) and preparing a discharge summary (p=0.017). Males had a higher level of confidence compared to females in performing a digital rectal exam (3.0), while having

Table 2. Median level of confidence on general competencies and skills of 35% of the clinical clerks.

General Competencies and Skills	1 NOT CONFIDENT AT ALL (%)	2 SLIGHTLY CONFIDENT (%)	3 SOMEWHAT CONFIDENT (%)	4 FAIRLY CONFIDENT (%)	5 COMPLETELY CONFIDENT (%)	Median
Hx Taking (Medical Px)	0.7	2.2	12.2	64.0	20.9	4.00
PE (Medical Px)	2.2	7.9	38.1	46.0	5.8	4.00

Hx Taking (Surgical Px)	0.7	5.0	15.8	60.4	18.0	4.00
PE (Surgical Px)	2.2	10.8	43.9	37.4	5.8	3.00
Hx Taking (Neurology Px)	3.6	11.5	33.8	36.7	14.4	4.00
PE (Neurology Px)	7.2	23.7	39.6	23.7	5.8	3.00
Hx Taking (OB-GYNE Px)	1.4	5.0	23.0	48.9	21.6	4.00
PE (OB-GYNE Px)	3.6	21.6	38.1	28.8	7.9	3.00
Hx Taking (Pediatric Px)	1.4	11.5	27.3	48.9	10.8	4.00
PE (Pediatric Px)	2.9	15.8	43.9	32.4	5.0	3.00
Preparing an Initial Summary and Complete Database	1.4	2.9	11.5	43.2	41.0	4.00
Preparing a Discharge Summary	1.4	3.6	10.1	42.4	42.4	4.00
Giving Discharge Instructions and Prescriptions	2.2	5.0	15.8	46.0	30.9	4.00
Proper Donning and Doffing	2.2	5.0	18.0	38.1	36.7	4.00
Proper Handwashing	1.4	0	2.9	20.9	74.8	5.00
Performing a NGT Insertion	33.1	22.3	16.5	19.4	8.6	2.00
Performing a Foley Catheter Insertion	11.5	20.1	21.6	28.1	18.7	3.00
Performing a Intravenous Access Insertion	18.0	20.1	30.9	23.0	7.9	3.00
Performing a Blood Extraction	11.5	12.2	24.5	25.9	25.9	4.00
Performing a Bag-Valve Ventilation	18.7	17.3	25.2	20.9	18.0	3.00
Performing a DRE	25.9	23.0	22.3	15.8	12.9	2.00
Suturing	23.7	31.7	20.9	18.7	5.0	2.00
Wound Care	5.0	12.2	33.1	31.7	18.0	3.00
Immunization of a Pediatric Px	10.1	10.8	25.9	31.7	21.6	4.00
Practicing EINC	9.4	13.7	28.1	33.1	15.8	4.00

Note: Hx = History; Px = Patient; PE = Physical Examination; NGT = Nasogastric Tube; DRE = Digital Rectal Examination; EINC = Essential Intrapartum and Newborn Care

the same level of confidence in preparing a discharge summary (4.00), and taking the history for an obstetric and gynecologic patient (4.00), surgical patient (4.00), and medical patient (4.00) (Figure 1).

Among the skills, there was a statistically significant difference between sexes in the history taking of an obstetric/gynecologic patient, a surgical patient , and a medical patient, as well as performing a digital rectal examination, physical examination of a pediatric patient, and preparation of a discharge summary (Table 3).

A notable disparity exists in the confidence levels regarding general competencies and skills between clerks with and without previous medical experience in conducting foley catheter insertion (p=0.012), intravenous access insertion (p=0.029), blood extraction (p=0.027), suturing (p=0.002), and practicing EINC (p=0.030). Clerks with prior medical experience had a higher median level of confidence compared to those without prior medical experience in performing a foley catheter insertion (4.00), blood extraction (4.00), suturing (3.00), and practicing EINC (4.00). There is an equal level of confidence observed between clerks with and without prior medical experience in performing an intravenous access insertion. There was a statistically significant difference for foley catheter insertion, IV access insertion, blood extraction, and suturing, and for performing EINC between males and females (Table 4).

Discussion

General Competencies and Skills

The results revealed that among the general competencies and skills, performing proper hand washing is the skill that most clinical clerks were highly confident to execute, followed by history taking, physical examination of a medical patient, preparing an initial summary and complete database, preparing a discharge summary, giving discharge instructions and prescriptions, proper donning and doffing, performing blood extraction, immunization of a pediatric patient, and practicing EINC followed by physical examination (surgical, neurology, obstetric/gynecologic , and pediatric patients), performing a foley catheter insertion, intravenous

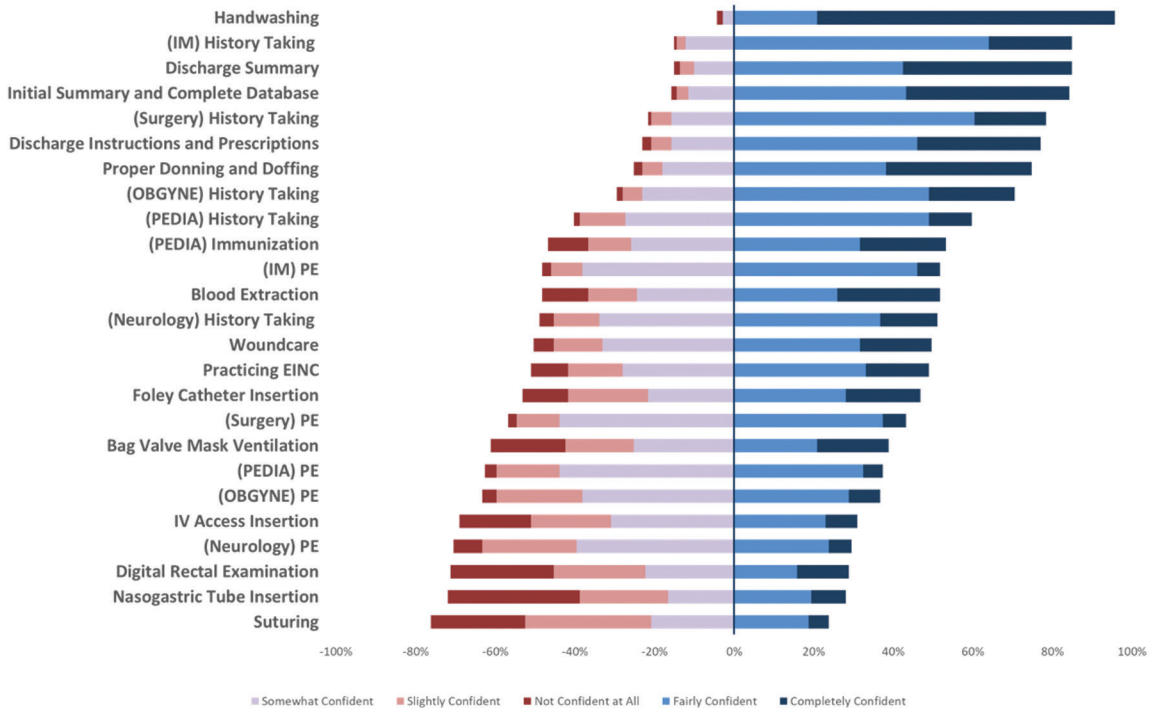

Figure 1. Ranked overall general competencies and skills of 35% of the clinical clerks.

Table 3. Comparison of the level of confidence between sexes.

General Competencies and Skills	Male		Female		Difference	p-value
	Median	IQR	Median	IQR		
Hx Taking (Medical Px)	4.00	1	4.00	0	0	**0.022**
PE (Medical Px)	4.0.0	1	4.00	1	0	0.568
Hx Taking (Surgical Px)	4.00	1	4.00	0	0	**0.009**
PE (Surgical Px)	3.00	1	3.00	1	0	0.435
Hx Taking (Neurology Px)	3.00	1	4.00	1	-1	0.254
PE (Neurology Px)	3.00	2	3.00	2	0	0.763
Hx Taking (OB-GYNE Px)	4.00	1	4.00	1	0	**0.001**
PE (OB-GYNE Px)	3.00	2	3.00	1	0	0.221
Hx Taking (Pediatric Px)	4.00	1	4.00	1	0	0.131
PE (Pediatric Px)	3.00	2	3.00	1	0	**0.049**
Preparing an Initial Summary and Complete Database	4.00	2	4.00	1	0	0.066
Preparing a Discharge Summary	4.00	2	4.00	1	0	**0.017**
Giving Discharge Instructions and Prescriptions	4.00	2	4.00	1	0	0.981
Proper Donning and Doffing	4.00	2	4.00	1	0	0.680
Proper Handwashing	5.00	0	5.00	1	0	0.921
Performing an NGT Insertion	3.00	3	2.00	3	1	0.092
Performing a Foley Catheter Insertion	3.00	1	3.00	2	0	0.331
Performing an Intravenous Access Insertion	3.00	2	3.00	2	0	0.546
Performing a Blood Extraction	4.00	3	4.00	2	0	0.798
Performing a Bag-Valve Ventilation	4.00	3	3.00	2	1	0.108
Performing a DRE	3.00	2	2.00	2	1	**0.004**
Suturing	2.00	2	2.00	1	0	0.724
Wound Care	4.00	1	3.00	1	0.5	0.646
Immunization of a Pediatric Px	3.00	2	4.00	1	-1	0.398
Practicing EINC	3.00	1	4.00	1	-1	0.748

Note: IQR = Interquartile Range; Hx = History; Px = Patient; PE = Physical Examination; NGT = Nasogastric Tube; DRE = Digital Rectal Examination; EINC = Essential Intrapartum and Newborn Care

Table 4. Comparison of the level of confidence of clinical clerks based on their previous clinical experience.

General Competencies and Skills	Without Prior Medical Experience		With Prior Medical Experience		Difference	p-value
	Median	IQR	Median	IQR		
Hx Taking (Medical Px)	4.00	0	4.00	0	0	0.155
PE (Medical Px)	3.00	1	4.00	1	-1	0.325
Hx Taking (Surgical Px)	4.00	1	4.00	0	0	0.103
PE (Surgical Px)	3.00	1	3.00	1	0	0.163
Hx Taking (Neurology Px)	3.00	1	4.00	1	-1	0.099
PE (Neurology Px)	3.00	2	3.00	2	0	0.085
Hx Taking (OB-GYNE Px)	4.00	1	4.00	1	0	0.339
PE (OB-GYNE Px)	3.00	2	3.00	1	0	0.335
Hx Taking (Pediatric Px)	4.00	1	4.00	1	0	0.897
PE (Pediatric Px)	3.00	2	3.00	1	0	0.377
Preparing an Initial Summary and Complete Database	4.00	1	4.00	1	0	0.919
Preparing a Discharge Summary	4.00	1	4.00	1	0	0.716
Giving Discharge Instructions and Prescriptions	4.00	2	4.00	1	0	0.194
Proper Donning and Doffing	4.00	2	4.00	1	0	0.211
Proper Handwashing	5.00	1	5.00	0	0	0.169
Performing an NGT Insertion	2.00	3	2.00	2	0	0.354
Performing a Foley Catheter Insertion	3.00	2	4.00	2	-1	**0.012**
Performing an Intravenous Access Insertion	3.00	1	3.00	2	0	**0.029**
Performing a Blood Extraction	3.00	1	4.00	2	-1	**0.027**
Performing a Bag-Valve Ventilation on a Patient	3.00	2	3.00	2	0	0.285
Performing a DRE	2.00	2	3.00	2	-1	0.064
Suturing	2.00	2	3.00	2	-1	**0.002**
Wound Care	3.00	1	4.00	1	-1	0.082
Immunization of a Pediatric Px	3.00	2	4.00	1	-1	0.072
Practicing EINC	3.00	2	4.00	1	-1	**0.030**

Note: IQR = Interquartile Range; Hx = History; Px = Patient; PE = Physical Examination; NGT = Nasogastric Tube; DRE = Digital Rectal Examination; EINC = Essential Intrapartum and Newborn Care

access insertion, bag-valve ventilation, and wound care. They were also more confident in performing physical examination on medical patients than on surgical, neurologic, obstetric/gynecologic, and pediatric patients. However, performing nasogastric tube insertion, digital rectal examination, and suturing were the skills that they were the least confident to perform.

Significant differences were revealed over time in a study regarding surgical interns' confidence in their technical skills, patient management skills, administrative tasks, and knowledge after the implementation of a year-long practical skills curriculum which consisted of didactic, simulation, and practical sessions.[4] A study on pre-internship medical graduates, revealed that pre-internship training helped in improving self-perceived confidence and actual performance of nasogastric tube insertion.[5] The COVID-19 pandemic has led to significant challenges in traditional education, particularly in the medical field. Face-to-face classes have been limited, and duty-hours restrictions have been implemented, making it more difficult for students to develop their skills with limited hands-on guidance from physicians. Moreover, access to necessary materials, equipment, and real patients has been restricted, further impacting the learning process.

This current study revealed that digital rectal examination was one out of the three skills with the lowest reported confidence. Prior to the COVID-19 pandemic, it was found that many graduating students and newly graduated physicians were insufficiently prepared for performing DRE skills and insufficient supervision by senior physicians was claimed to be the most relevant constraint for the acquisition of DRE skills.[6] A related study revealed that among the 13 history taking and physical examination skills, rectal examination had the highest percentage of students with 0-25% confidence level.[7] In the same study, the majority of the students reported a high confidence level (>75%) in performing 7 of the 13 history taking/physical examination skills, and only 2 of the 39 diagnostic/treatment procedure skills.[7] In the current study, clerks reported a high confidence level in history-taking compared to diagnostic/ treatment procedure skills such as foley-catheter insertion, IV catheter insertion, bag-valve ventilation, wound care, nasogastric tube insertion, and suturing. These may be a reflection of their early preclinical years practice of history and physical examination skills on simulated and standardized patients which were not done in diagnostic and treatment procedures. In the same study, 73.9% of the students reported a high confidence level (>75%) in history taking (surgery) and 60.8% reported a high confidence level in PE (surgery).[7] In contrast, an average of 78.4% of the respondents reported high confidence in history taking skills (surgery) and 43.2% on physical examination (surgery) skills in this investigation. Lower percentage of the respondents in the current study reported a high confidence level in physical examination (surgery) while a higher percentage of the respondents reported a high confidence level in history taking (surgery) compared to the pre-pandemic study. One possible reason for the lower percentage in physical examination could be the limited face-to-face preceptorials during the pre-clerkship year (third year) and reduced hours of face-to-face activities in the hospital during their clerkship year.[1] The higher percentage in history taking could be a reflection of the emphasis on history taking during preceptorial sessions as this was more feasible to teach and practice by utilizing the role-playing and feedback method via video conferencing apps such as Zoom or Google Meet despite the lack of physical or face-to-face interaction.[1,8,9]

Confidence Between Sexes

The results have shown a significant difference of confidence level between the two sexes in select general competencies and skills. Female clerks were significantly more confident than the males in performing history taking of a medical patient, surgical patient, and OB-GYNE patient, PE of a pediatric patient, and in preparing a discharge summary. This is in contrast with previous studies that reported that female medical students were viewed as significantly less confident than male medical students on overall confidence.[7,10,11] Meanwhile, male clerks were significantly more confident in performing a DRE. This is consistent with a study that demonstrated higher self-reported scores of males on procedural confidence.[11]

Medical Experience

The results have demonstrated a significant difference in confidence levels between clinical

clerks with prior and those without prior medical experience in the performance of these skills: foley catheter insertion, intravenous access insertion, blood extraction, suturing, and EINC. The clinical clerks with prior medical experience were reported to have a higher median self-confidence as compared to those who did not have prior medical experience.

It was revealed that clinical clerks with prior medical experience were more confident than clinical clerks without prior medical experience in clinical competencies involving procedural skills.[12] Procedural skills teaching and learning is divided into two stages: the cognitive phase, and the psychomotor phase.[12] The cognitive phase of procedural skills teaching is reinforced throughout the medical student's first three years: lectures and didactic sessions, analysis of text and case studies, videos, and demonstrations; with these activities aiding the students in conceptualization, visualization, and verbalization of the procedural skill. After the cognitive phase, the student should have been equipped with the knowledge (i.e. the anatomy, indications, contraindications, complications, and steps) necessary to perform the procedure. The psychomotor phase of procedural skills are performed in either a simulated setting (involving cadavers and mannequins) or a live patient interaction supervised by their preceptors. Medical simulation permits students to learn, practice, and repeat procedures, and gives them a safe avenue to correct their mistakes and reinforce competent performances.[13] Procedural skills cannot be learned maximally through simulation alone. Another study found that live patient interactions cannot be replaced by online interviews, and they also cannot be replaced by medical simulations.[13] Live patient interaction is especially necessary for procedures in which artificial settings are not easily replicable, or simply not achievable–and "the anxiety of both patient and physician, the sensation of crossing tissue plains, and working in a bloody field can rarely be reproduced".[12] Having prior medical experience posits that a medical clerk received the opportunity to practice these procedural skills, such as foley catheter insertion, in a psychomotor sense beyond medical simulations: where they performed the skill on a patient during an encounter.[14] This includes internships in hospitals to fulfill the requirements of an undergraduate degree and working in a clinic or hospital prior to getting into medical school.

A medical clerk's self-confidence is intrinsically tied to their perceived procedural competence, even if, statistically, the correlation is poor.[15] Procedural confidence influences a practitioner's willingness to perform procedures and maneuvers, and provision of an accurate self-assessment of skills. Even with the blended set-up, the COVID-19 pandemic deprived medical students globally of even medical simulation opportunities, and with it, the chance to proceed to the psychomotor phase of procedural skills teaching was stunted – clerks who already had medical experience prior to clerkship are more likely to have a higher self-confidence than their counterparts in procedural skills.

In five out of the 25 skills, clinical clerks with prior medical experience showed a statistically significant difference in confidence ($p > 0.05$) compared to clinical clerks without prior medical experience. These skills are performing foley catheter insertion, performing an intravenous access insertion, performing a blood extraction, suturing, and practicing EINC. This was similar to a study where there is a significant difference in confidence on pediatric practices between students with prior experience and those without.[16] Medical students who have a prior professional experience with children were reported to have a higher self-confidence as compared to those who do not have, as they already acquired the verbal and nonverbal skills to engage actively with pediatric patients.[16]

Conclusion

The study revealed statistically significant differences in the confidence level on the competencies and skills for medical practice between sex and prior medical experience. In terms of general competencies and skills, the highest reported confidence was in proper handwashing, followed by history taking, physical examination of a medical patient, preparing an initial summary and complete database, preparing a discharge summary, giving discharge instructions and prescriptions, proper donning and doffing, performing blood extraction, immunization of a pediatric patient, and practicing EINC. Clinical clerks demonstrated the lowest confidence when it came to performing nasogastric tube insertion, conducting a digital rectal examination (DRE), and suturing.

There was a statistically significant difference found between the perceived confidence between the sexes. Female clerks reported a higher confidence

on history taking of an OB-GYNE patient, surgical patient, and medical patient, physical examination of pediatric patient, and in preparing a discharge summary. Male clerks reported a statistically significantly higher confidence level on performing a digital rectal examination.

The results revealed that there is a statistically significant difference in the confidence level among clinical clerks who have prior medical experiences and those who did not have selected competencies and skills. Clinical clerks who have prior medical experience were reported to have a higher self-confidence in performing a foley catheter insertion, intravenous access insertion, blood extraction, suturing and practicing EINC.

References

1. Baticulon RE, Sy JJ, Alberto NRI, et al. Barriers to online learning in the time of COVID-19: A national survey of medical students in the Philippines. Med Sci Educ 2021 Feb 24;31(2):615-26. doi: 10.1007/s40670-021-01231-z.
2. McNair R, Griffiths L, Reid K, Sloan H. Medical students developing confidence and patient centredness in diverse clinical settings: a longitudinal survey study. BMC Med Educ 2016 Jul 15;16:176. doi: 10.1186/s12909-016-0689-y.
3. Wu EH, Fagan MJ, Reinert SE, Diaz JA. Self-confidence in and perceived utility of the physical examination: a comparison of medical students, residents, and faculty internists. J Gen Intern Med 2007 Dec;22(12):1725-30. doi: 10.1007/s11606-007-0409-8. Epub 2007 Oct 6.
4. Acosta D, Castillo-Angeles M, Garces-Descovich A, et al. Surgical practical skills learning curriculum: Implementation and interns' confidence perceptions. J Surg Educ 2018 Mar-Apr;75(2):263-70. doi: 10.1016/j.jsurg.2017.07.013. Epub 2017 Aug 19.
5. Santosh VC. Effectiveness of pre-internship training in skill development (Nasogastric Tube Insertion) for medical graduates-an objective assessment. IOSR J Dent Med Sci 2018 Dec; 17 (12): 48-52.
6. Nikendei C, Diefenbacher K, Köhl-Hackert N, et al. Digital rectal examination skills: first training experiences, the motives and attitudes of standardized patients. BMC Med Educ 2015 Feb 1;15:7. doi: 10.1186/s12909-015-0292-7.
7. Karim JA, Marwan YA, Dawas AM, Akhtar S. Self-confidence of medical students in performing clinical skills acquired during their surgical rotation. Assessing clinical skills education in Kuwait. Saudi Med J 2012 Dec;33(12):1310-6.
8. Keifenheim KE, Teufel M, Ip J, Speiser N, Leehr EJ, Zipfel S, et al. Teaching history taking to medical students: A systematic review. BMC Med Educ [Internet] 2015Sep28 [cited 2022Dec3];15(1). Available from: https://bmcmededuc.biomedcentral.com/
9. Huang S, Xu P, Yang J. An effective teaching method to enhance history-taking skills for Chinese medical students. Int J Higher Educ [Internet] 2018Mar27 [cited 2022Dec3];7(2):144–54. Available from: https://files.eric.ed.gov/fulltext/EJ1175055.pdf
10. Blanch DC, Hall JA, Roter DL, Frankel RM. Medical student gender and issues of confidence. Patient Educ Couns 2008 Sep;72(3):374-81. doi: 10.1016/j.pec.2008.05.021. Epub 2008 Jul 24.
11. Vajapey SP, Weber KL, Samora J. Confidence gap between men and women in medicine: a systematic review. Curr Orthop Prac 2020 Sep/Oct; 31(5):494-502.
12. Kovacs G. Procedural skills in medicine: linking theory to practice. J Emerg Med 1997 May-Jun;15(3):387-91. doi: 10.1016/s0736-4679(97)00019-x.
13. Mian A, Khan S. Medical education during pandemics: a UK perspective. BMC Med 2020 Apr 9;18(1):100. doi: 10.1186/s12916-020-01577-y.
14. Tayade MC, Latti RG. Effectiveness of early clinical exposure in medical education: Settings and scientific theories - Review. J Educ Health Prom 2021 Mar 31;10:117. doi: 10.4103/jehp.jehp_988_20.
15. Connick RM, Connick P, Klotsas AE, Tsagkaraki PA, Gkrania-Klotsas E. Procedural confidence in hospital based practitioners: implications for the training and practice of doctors at all grades. BMC Med Educ 2009 Jan 12;9:2. doi: 10.1186/1472-6920-9-2.
16. Teh JJ, Cheung KY, Patrick Y, Panahi M, Boyle R, Tudor-Williams G. Self-perceived confidence of medical students communicating with pediatric patients in a 7-week pediatric placement: A pilot survey. Adv Med Educ Pract 2020 Feb 24;11:163-9. doi: 10.2147/AMEP.S234856.

Association between caffeine use disorder and socio-demographic characteristics (sex, employment and smoking status) of Quezon City residents: An analytical cross-sectional study

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Abstract

Introduction Caffeine use disorder (CUD), a problematic caffeine use pattern, is yet to be recognized under DSM-5 and is under consideration for further research. This study aimed to determine if the sex, employment status, and smoking status of Quezon City residents aged 18 years old and above are associated with CUD, and to determine the mean daily caffeine consumption (MDCC) of caffeinated products and the proportion of individuals meeting the CUD criteria.

Methods A total of 334 respondents accomplished the online survey that collected socio-demographic information and evaluated CUD using an 8-point Caffeine Consumption Questionnaire (CCQ).

Results The study population was mostly composed of females, unemployed, and non-smokers. Results showed that 17% of respondents have CUD, that brewed coffee was most consumed daily, the MDCC of the study population was 158.31 mg; and females were at an increased risk for CUD, while nonsmokers and unemployed individuals were at reduced risk.

Conclusion The proportion of Quezon city residents that have CUD is at 17%, consuming an average of 158.31 mg of coffee daily, with brewed coffee being consumed most. Female residents are at an increased risk of having CUD, while nonsmokers and unemployed individuals are at a decreased risk.

Key words: Caffeine, coffee, Quezon city, cross-sectional studies, diagnostic and statistical manual of mental disorders

Caffeine is one of the most consumed psychoactive substances and is used by more than 80% of the world's population.[1] In 2019, there has been a rise in the long-term increase in coffee consumption over the years in the country.[2] The widespread consumption of caffeine was significantly linked to increased alertness, increased endurance, enhanced long-term memory, and increased mental concentration.[3-4] Excessive consumption of caffeine can lead to dependency, dangerous intoxication and side effects, and the abrupt cessation of the intake of caffeine may prompt symptoms of withdrawal.[5]

Caffeine use disorder (CUD) refers to a destructive, problematic caffeine use pattern that results in severe clinical disability or anxiety. However, the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5) does not consider it as a psychiatric disorder due to lack of evidence on the prevalence and psychiatric importance of caffeine use disorder in

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general population samples.[6] Currently, there are no studies regarding the association between CUD and socio-demographic characteristics in the Philippines. The average caffeine consumption is not commonly recorded which makes the proportion of individuals at risk for caffeine use disorder unknown. Moreover, to bridge the knowledge gap, previous researchers have recommended conducting additional analytical cross-sectional studies to enhance the comprehension of Cannabis Use Disorder (CUD), particularly identifying the socio-demographic groups that may be most affected.

This study aimed to investigate the association of caffeine use disorder and socio-demographic characteristics (sex, employment and smoking status) among Quezon City residents aged 18 years old and above in an analytical cross-sectional study. Specifically, it aimed to determine the proportion of Quezon City residents who fulfill the criteria of having Caffeine Use Disorder using the 3-item Caffeine Use Disorder Questionnaire (CUDQ) and to determine the mean daily caffeine consumption (MDCC) of Quezon City residents with five caffeinated products (brewed coffee, instant coffee, tea, energy drinks, soda) using an 8-point Caffeine Consumption Questionnaire (CCQ) Likert Scale.

Methods

This study has been given ethical approval by the UERM Ethics Review Committee. An analytical cross-sectional study was conducted. The surveys used in the study were administered online via Google Forms from August to October 2021. The target population for this study were adult residents currently living in Quezon City from May 2021 to October 2021, who could read in English or Tagalog language and have consumed caffeine for the past 12 months. The selected sample was recruited using social media advertisements (Facebook, Twitter, Instagram) over a two-month period. The sample size is 325 participants based on a similar study conducted in New Zealand that also determined the association between CUD and socio-demographic characteristics of a select population.[7]

The variables that were asked in the socio-demographic characteristics survey tool are sex, smoking status, and employment status. An 8-point likert scale was used to measure caffeine consumption per participant, where each response corresponds to the following:

0 - never
1 - less than or equal to one portion a week
2 = two to six portions a week
3 = one portion per day
4 = two portions per day
5 = three portions per day
6 = four portions per day
7 = five or more times a day

wherein the standard serving size for one portion of each beverage was also indicated in the questionnaire (e.g. 1 portion of instant coffee = 237 mL or 1 cup; 1 portion of energy drink = one 250 mL can). This was used for the following products: brewed coffee, instant coffee, tea, energy drink(s), soda and others.[7,8]

The proponents of the study then converted the servings of each beverage into milligrams of caffeine for analysis and study comparison. The following estimates were used to calculate caffeine consumption: 1 cup (8 oz./237 mL) of brewed coffee = 100 mg, 1 cup (8 oz./237 mL) of instant coffee = 60 mg, 1 cup (8 oz./237 mL) of tea = 45 mg, 1 can (250 mL) of energy drink = 75 mg, 1 can (250 mL) of soda = 30 mg.[7,8] Products consumed less than daily were not included in the computation. The lower limit for daily consumption is 1 portion per day and the upper limit is 5 portions, in accordance with the caffeine consumption questionnaire. To compute the daily caffeine consumption, the number of portions consumed per day was multiplied by the amount of caffeine in 1 portion of the product.[7,8] For other caffeine products, participants were asked to specify which products, and the researchers used the packaging information to measure the amount of caffeine.

The respondents were asked to answer the Caffeine Use Disorder Questionnaire (CUDQ). The CUDQ has high internal consistency reliability (3 items; $\alpha = 0.82$) and was used to determine if the participants meet the proposed DSM-5 criteria for CUD.[7] These questionnaires were adapted from previous studies regarding caffeine use disorder.[7,8,9] In this 3-item questionnaire, the respondents answered yes/no questions, depending on the scenario being asked, if it is applicable to them or not. The questions were designed to measure dependence on caffeine and any experienced adverse effects when consuming caffeine.

The average caffeine consumption for each drink and the mean total caffeine consumption were computed. The proportion of participants with reported caffeine use disorder was also calculated.

The association between CUD and socio-demographic characteristics was assessed by computing the Prevalence Rate Ratio (PRR) using 2x2 tables. A chi square test of independence was then performed to compute for significance where a p-value less than 0.05 indicates a statistically significant association between the socio-demographic variable being assessed and CUD.

Results

Respondent Characteristics

Three hundred thirty four respondents (n = 334) answered the survey questionnaires. There were more female participants (n = 235) than male participants (n = 99), more unemployed participants (n = 210) than employed participants (n = 124), and more non-smokers (n = 300) than smokers (n = 34) that were included in the study.

Caffeine Consumption by Product

An 8-point CCQ likert scale was used to determine the mean daily caffeine consumption (MDCC) of different caffeinated products which was determined to be 158.31mg per day (SD = 228.471). Brewed coffee had a daily caffeine intake of 66.17 mg (SD = 108.604) and was the most consumed product (37.43%), followed by instant coffee (32.63%), and tea (14.97%). A greater proportion of females, unemployed individuals, and nonsmokers were able to fulfill the criteria for CUD as summarized in Table 1. Females were determined to be at an increased risk of having CUD compared to males. On the other hand, nonsmokers and unemployed individuals are at a decreased risk for CUD as opposed to smokers and employed individuals, respectively, as shown in Table 2.

Table 1. Proportion of respondents with CUD according to socio-demographic characteristics and their level of caffeine consumption.

Predictor Variables	Total Sample	Population Proportion that met the criteria for CUD
Sex		
Male	99	10 (17.54%)
Female	235	47 (82.46%)
Employment Status		
Unemployed	210	49 (85.96%)
Employed	124	8 (14.04%)
Smoking Status		
Non-smoker	300	32 (56.14%)
Smoker	34	25 (43.86%)
Total	334	57 (17.07%)

Table 2. Computed PRR, 95% confidence interval, and p-values for each socio-demographic characteristic.

Socio-demographic Characteristics	PRR	95% Confidence Interval	p-value
Sex (Female)	1.98	0.65-0.75	0.028
Smoking Status (Non-smoker)	0.694	0.32-0.42	0.248
Employment Status (Unemployed)	0.756	0.07-0.13	0.290

Discussion

Caffeine use disorder is characterized as a problematic caffeine use pattern that can lead to clinically significant distress or impairment. It is caused by increased tolerance and physical withdrawal symptoms from caffeine.[10] Based on the proposed DSM-5 proposal criteria, a problematic pattern of caffeine use leading to clinically relevant disability or anxiety is manifested by at least the first three of the proposed criteria occurring during a 12-month span. These three conditions are: (1) A recurrent tendency or ineffective attempt to minimize or regulate the use of caffeine, (2) Caffeine use is continued in spite of awareness of having a chronic or recurring physical or psychological condition that is likely to have been triggered or aggravated by caffeine, (3) Withdrawal, as indicated by symptoms of caffeine withdrawal (e.g. headache, nausea, fatigue) and caffeine is used to alleviate or prevent signs of withdrawal.[9]

Results show that the most common product consumed daily by the respondents was brewed coffee (37.43%), followed by instant coffee (32.63%), and tea (14.97%). This differs from the most leading caffeinated products among Asia and the Pacific countries which are black and green teas and carbonated soda, which

can be attributed to social and cultural context, environmental conditions, physical, psychological, and emotional expectations, and individual knowledge and perceptions.[10,11]

The findings of this study reveal that 17% of respondents exhibit Caffeine Use Disorder (CUD). This aligns closely with a comparable study in New Zealand, where 19.5% of the total respondents met the criteria, in contrast to the United States, where only 8% did.[7,12]

Females are at an increased risk for CUD. Research has shown that low estradiol levels, a natural part of the menstrual cycle, can suppress the effects of caffeine in females, potentially resulting in increased intake to enhance its effects. Caffeine is also more potent on males and thus, they only need to consume a lesser amount to be able to feel its effects.[13,14] Consequently, the adverse effects of caffeine such as increased anxiety are also more prevalent in males, which deter them from further consumption.[15]

Nonsmokers are at a decreased risk of having CUD compared to smokers, due to the effect of cigarette consumption which accelerates caffeine metabolism. As a result, this diminishes the drug effect of caffeine in smokers, prompting an increase in their caffeine consumption.[16]

Unemployed individuals are at a decreased risk of having CUD compared to employed individuals as the latter rely on caffeine to maintain physical and cognitive performance in times of sleep deprivation.[17] This is in contrast to other studies, wherein unemployment was shown to have an increased risk of CUD due to higher stress levels and therefore the need for caffeine consumption.[18] An explanation why unemployed individuals are at a decreased risk of having CUD can be attributed to the shift from working in offices to work-at-home set-ups since the pandemic started. Employees who work remotely report longer work hours and an inability to disengage from work, regardless of whether or not these extended work hours are expected by their companies.[19] This may cause employees to drink more caffeinated beverages to remain stimulated while working at home.

In conclusion, 17% of the total respondents, mostly composed of females, nonsmokers, and unemployed individuals, fulfilled the CUD criteria. The results of the study have also shown that the mean daily caffeine consumption of the Quezon City residents was 158.31mg per day and brewed coffee was the most consumed product followed by instant coffee and tea. Females were found to have an increased risk of having CUD as compared to males, whereas nonsmokers and unemployed individuals have a reduced risk for CUD as opposed to smokers and employed individuals, respectively.

References

1. Lee KH, Human GP, Fourie JJ, Louw WA, Larson CO, Joubert G. Medical students use of caffeine for academic purposes and their knowledge of its benefits, side-effects and withdrawal symptoms. South Afr Fam Pract 2009 Jul 1 [cited 2020 Oct 3];51(4):322-7. Available from https://www.tandfonline.com/doi/abs/10.1080/20786204.2009.10873872
2. Panaligan A, Baltazar MD, Alejandro GJ. Genetic polymorphism of registered and popularly cultivated coffee (Coffea spp.) in the Philippines using inter-simple sequence repeats markers. Biodiv J 2020 Aug 24 [cited 2020 Nov 8];21(9). Available from https://smujo.id/biodiv/article/view/6165/4213
3. James JE. Critical review of dietary caffeine and blood pressure: a relationship that should be taken more seriously. Psychosom Med 2004 Jan 1 [cited 2020 Oct 3];66(1):63-71. Available from https://pubmed.ncbi.nlm.nih.gov/14747639/
4. Lopez-Garcia E, van Dam RM, Rajpathak S, Willett WC, Manson JE, Hu FB. Changes in caffeine intake and long-term weight change in men and women. Am J Clin Nutr 2006 Mar 1 [cited 2020 Oct 3];83(3):674-80. Available from https://pubmed.ncbi.nlm.nih.gov/16522916/
5. James JE, Rogers PJ. Effects of caffeine on performance and mood: withdrawal reversal is the most plausible explanation. Psychopharmacology 2005 Oct 1 [cited 2020 Oct 3];182(1):1-8. Available from https://pubmed.ncbi.nlm.nih.gov/16001109/
6. Meredith SE, Juliano LM, Hughes JR, Griffiths RR. Caffeine use disorder: a comprehensive review and research agenda. J Caffeine Res 2013 Sep 1 [cited 2020 Oct 3];3(3):114-30. Available from https://www.ncbi.nlm.nih.gov/pmc/articles
7. Booth N, Saxton J, Rodda SN. Estimates of caffeine use disorder, caffeine withdrawal, harm and help-seeking in New Zealand: A cross-sectional survey. Addictive Behaviors 2020 Oct 1 [cited 2020 Oct 15];109:106470.. Available from https://www.sciencedirect.com/science/article/abs/pii/S0306460320306006
8. Ágoston C, Urbán R, Richman MJ, Demetrovics Z. Caffeine use disorder: An item-response theory analysis of proposed DSM-5 criteria. Addictive behaviors. 2018 Jun 1 [cited 2020 Oct 15];81:109-16.. Available from https://www.sciencedirect.com/science/article/pii/S0306460318300753

9. APA D. Diagnostic and statistical manual of mental disorders fifth edition. DSM-5 Arlington Am Psychiatr Publ 2013 [cited 2020 Oct 15]. Available from http://repository.poltekkes-kaltim.ac.id/657/1/Diagnostic%20and%20statistical%20manual%20of%20mental%20disorders%20_%20DSM-5%20%28%20PDFDrive.com%20%29.pdf
10. Reyes CM, Cornelis MC. Caffeine in the diet: country-level consumption and guidelines. Nutrients 2018 Nov [cited 2020 Nov 8];10(11):1772. Available from https://www.mdpi.com/2072-6643/10/11/1772/pdf
11. Wham C, Rowe K, Ali A, Rutherford-Markwick K. Influences of caffeine consumption among adult New Zealanders: A qualitative study. J Caffeine Res 2017 Dec 1 [cited 2020 Nov 8];7(4):142-50. Available from https://www.liebertpub.com/doi/abs/10.1089/jcr.2017.0020
12. Sweeney MM, Weaver DC, Vincent KB, Arria AM, Griffiths RR. Prevalence and correlates of caffeine use disorder symptoms among a united states sample. J Caffeine Adenosine Res 2020 Mar 1 [cited 2020 Oct 15];10(1):4-11. Available from https://doi.org/10.1089/caff.2019.0020
13. Temple JL, Ziegler AM. Gender differences in subjective and physiological responses to caffeine and the role of steroid hormones. J Caffeine Res 2011 Mar 1 [cited 2021 Oct 19];1(1):41-8. Available from https://www.liebertpub.com/doi/abs/10.1089/jcr.2011.0005
14. Adan A, Prat G, Fabbri M, Sànchez-Turet M. Early effects of caffeinated and decaffeinated coffee on subjective state and gender differences. Progr Neuro-Psychopharmacol Biol Psychiatr 2008 Oct 1 [cited 2021 Oct 19];32(7):1698-703. Available from https://www.sciencedirect.com/science/article/pii/S0278584608002030
15. Botella P, Parra A,. Coffee increases state anxiety in males but not in females. Hum Psychopharmacol Clin Exper 2003; 18(2). 2003 Feb 17 [cited 2021 Oct 19]. Available from https://onlinelibrary.wiley.com/doi/abs/10.1002/hup.444
16. Benowitz NL, Peng M, Jacob III P. Effects of cigarette smoking and carbon monoxide on chlorzoxazone and caffeine metabolism. Clin Pharmacol Ther 2003 Nov [cited 2020 Nov 8];74(5):468-74. Available from https://ascpt.onlinelibrary.wiley.com/doi/abs/10.1016/j.clpt.2003.07.001
17. McLellan TM, Caldwell JA, Lieberman HR. A review of caffeine's effects on cognitive, physical and occupational performance. Neurosci Biobehav Rev 2016 Dec 1 [cited 2021 Oct 19];71:294-312.
18. Baum A, Fleming R, Reddy D. Unemployment stress: Loss of control, reactance and learned helplessness. Soc Sci Med 1986 [cited 2021 Oct 19]; 22(5) : 509-16. Available from https://www.sciencedirect.com/science/article/abs/pii/027795368690016X?via%3Dihub
19. Crosbie T, Moore J. Work–life balance and working from home. Social Policy and Society 2004 Jul;3(3):223-33. [cited 2021 Nov 29]; Available from https://research.tees.ac.uk/en/publications/worklife-balance-and-working-from-home

Association of internet gaming disorder to depression, anxiety and stress among Filipino adolescents in selected public high schools in Pasay City

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Abstract

Introduction This study determined the relationship of personal factors and gaming factors with Internet Gaming Disorder (IGD). It aimed to provide information on the association of IGD with depression, anxiety, stress and both depression and anxiety among adolescent gamers.

Methods This was an analytic cross-sectional study among 560 14-18-year-old adolescents from two public high schools in Pasay City that used the Internet Gaming Disorder Scale–Short-Form (IGDS9-SF), Depression, Anxiety and Stress Scale-21 items (DASS-21) and gamer profile questionnaires.

Results The prevalence of Internet Gaming Disorder (IGD) was low at 1.1%, while moderate depression was observed in 67%, stress in 46.8%, both depression and anxiety in 64.8%, and high anxiety in 89.3% among adolescents. Using multiple logistic regression to control the effects of possible confounders, the association of IGD with depression (OR 0.971, 95% CI 0.085-11.084, p-value .981), anxiety (OR 6.0x107, p-value .999), stress (OR 6.135, 95% CI 0.373-100.991, p-value .204) and both depression and anxiety (OR 1.027, 95% CI 0.089-11.846, p-value .983) were not statistically significant.

Conclusion The odds of depression, anxiety, stress and both depression and anxiety were higher among those with IGD as compared to those without IGD. However, it is not statistically significant. This study recommended further validation of the new IGD definition in the local setting and longitudinal studies with a larger population to determine other factors associated with mental disorders.

Key words: adolescent, internet, depression, anxiety, stress

There are more than 3.24 billion gamers worldwide based on data for 2023.[1] In Southeast Asia, the prevalence rate of adolescents who use internet online gaming is 29.6% and the Philippines is 3rd highest in this region in terms of number of gamers.[2] There are 15.66 million Filipino gamers and majority are young adults.[1,3]

The growing accessibility of internet technologies such as the usage of the internet for gaming has continuously increased. Studies show that internet gaming has been linked to diseases such as eye strain, early blurring of vision, headaches, overeating and obesity, physical strain on the hands, back and neck, tendons inflammation and articular degeneration in the thumb joint and index fingers, and poor posture (forward head or "poking-chin posture").[4,5,6] Internet Gaming Disorder (IGD) is one of the most significant

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psychological conditions and its definition of IGD has changed and was described in the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders.[7]

Studies worldwide have shown a consistently increasing trend in the diagnosis of IGD.[7] Its prevalence is 1 to 10% in Western countries while an alarming 10 to 15% prevalence rate is reported in Asian countries.[8,9,10] The prevalence among adolescents in America is 8.5%, 5.5% in Germany and 4.3% in Hungary.[11,12,13] The prevalence in Hong Kong is 15.6% while 13.8% in Korea.[14,15] Filipinos also have a similar trend as those reported in other countries. The prevalence of IGD among Filipino internet game players ranges from 10.4% to 54.76%.[16,17,18,19] The issues are the use of different types of questionnaire tools and the criteria to determine IGD prevalence vary, which cause dissimilar reports. This study adopted the new IGD definition using the criteria of DSM-5-TR, which leads to clearer and comparable data with other research.[7]

Currently, although there is local literature on the prevalence of internet gaming disorder, the studies done locally did not follow the new definition of IGD based on DSM-5-TR of the American Psychiatric Association. Moreover, this study determined the relationship of personal factors and gaming factors with IGD. In addition, this study provides information on the association of IGD with depression, anxiety, stress and both depression and anxiety among adolescent gamers.

Methods

Research Design

An analytical cross-sectional study was conducted in 2 public high schools in Pasay City, Metro Manila, Philippines from March to May 2023. A validated self-administered questionnaire, Internet Gaming Disorder Short Form (IGDSF-9) and Depression Anxiety Stress Scale-21 were distributed to Filipino adolescents in 2 public schools in Pasay City. This study was approved by the UERMMMCI Ethics Review Committee.

Participants

The author included Filipino adolescents engaged in online gaming for more than 12 months enrolled in public schools in Pasay City, Metro Manila, Philippines who understood either English or Filipino questionnaires and consented to participate. Excluded were those who reported to have been diagnosed with any severe eye problems, epilepsy and developmental disorder such as Autism Spectrum Disorder (ASD), Attention Deficit/Hyperactivity Disorder (ADHD), Major Depressive Disorder (MDD). Also, excluded were adolescents who were into online gambling, use non-networked video and personal computer gaming.

Using OpenEpi version 3 online software, the sample size was computed. A minimum sample size of 491 Filipino adolescents aged 14 to 18 years in the selected public high schools in Pasay City were needed. In this study of Grade levels 8 to 12 students, the selection procedure within each of these strata was random.

Measures

The researcher used 3 self-administered survey forms: 1) Participant's profile that includes the sociodemographic factors, family factors and gaming factors; 2 Internet Gaming Disorder Scale-Short Form (IGDS9-SF); and 3) Depression Anxiety Stress Scale-21 (DASS-21).

IGD was measured using a self-administered Internet Gaming Disorder Scale Short Form (IGDS9-SF) questionnaire. IGDs9-SF is a reliable and valid tool.[20,21,22,24] It is similar to the new IGD definition by the American Psychiatric Association Diagnostic and Statistical Manual of Mental Disorders Fifth Edition Text Revision, and it has a total of 9 items.[7] To differentiate disordered gamers from non-disordered gamers, the participants should have at least five criteria out of the nine by considering answers as '5: Very Often', which translates as endorsement of the criterion. The tool was reviewed and evaluated in various studies that showed very good methodological quality and a positive rating for the quality of statistical findings concerning internal consistency (Cronbach α=.810-.963 and person separation reliability=.86) of this tool.[25] In this study, the internal consistency of IGDS9-SF was good (Cronbach's alpha= 0.802).

Depression, anxiety, and stress were determined using the Depression, Anxiety and Stress Scale-21 items. DASS-21 is a self-administered reliable and valid tool that was used to determine depression and anxiety among adolescents. The Cronbach's

alpha of DASS-21 is 0.74 which has good internal consistency.[26] The reliability (internal consistencies) of the DASS-21 Anxiety, Depression, Stress, and Total scales were estimated using Cronbach's alpha. The α was 0.88 (95% CI .87–.89) for the Depression scale, 0.82 (95% CI .80–.83) for the Anxiety scale, 0.90 (95% CI .89–.91) for the Stress scale, and 0.93 (95% CI .93–.94) for the total scale.[27] In this study, the internal consistency of the depression scale was good (Cronbach's alpha=0.803), the anxiety scale was acceptable (Cronbach's alpha=0.790), the stress scale was acceptable (Cronbach's alpha= 0.742) and the total scale was excellent (Cronbach's alpha=0.909). Scores on the DASS-21 were multiplied by 2 to calculate the final score. The cut-off scores for depression was 10 and above, anxiety was 8 and above and stress was 15 and above.

Data Analysis

Out of the 760 questionnaires distributed to the preselected Grade 8 to 12 students of the participating schools, 681 were returned, resulting in a response rate of 88.44%. Among the returned questionnaires, 17.77% were excluded, comprising students aged 13 and over 18 years (17, 2.50%), non-players (55, 8.08%), recent online gamers (less than 1 year) (7, 1.03%), and those with incomplete responses exceeding 20% of the questionnaires (42, 6.17%). Chi square or Fisher's exact, when applicable, was used to determine the differences between those with and without IGD in terms of personal and gaming factors. Independent t-test was used to determine the mean age difference between IGD and no IGD. Logistic regression analysis was used to determine the association between IGD and depression, anxiety and stress, controlling for the effect of potential confounders. An odds ratio with a 95% confidence interval was also used to measure the association. A p-value of <0.05 is statistically significant.

Results

Personal Factors and IGD

There were 560 adolescent gamers from Grade 8 to 12 students included in the study. The mean age of the gamers was 15.98 years (±1.45 years). There were 38.9% males, 49.8% females and 8.4% LGBTQ. There were only 6 (1.1%) with IGD among adolescent gamers. There were 56.3% of adolescent gamers who belonged to a low monthly household income. There were 64.5% who spent PhP 0- 100 on internet gaming. Among those with IGD, 50% spent PhP 0-100, 33.3% spent PhP 101-500 and 16.7% spent PhP 501 and above on internet gaming. The mean age, grade level, type of school, monthly income, average weekly allowance and cost of internet gaming to IGD is not statistically different with p-value > 0.05 (Table 1).

Gaming factors and IGD

Most adolescent gamers have access to cellphones (88.4%). The most common types of internet games played were Multiplayer online battle arena (MOBA) (49.3%) and First-person shooter (FPS) (38.8%) games. There were 57.9% of adolescent gamers who played internet games <2 times a day and 39.3% played ≥ 2 times per day. However, among those without IGD, playing less than 2 times a day predominated and the difference is significant.

Most adolescent gamers played 2 hours and below per day (67.5%) during weekdays while 62.3% played more than 2 hours during weekends. Among those with IGD, 50% played more than 2 hours per day during weekdays and 100% played more than 2 hours during weekends. While among those without IGD, playing ≤ 2 hours during weekdays and playing more than 2 hours during weekends predominated.

Most adolescent gamers played at home (94.5%) and 13.2% played in other venues (computer shop, school, park, car, etc.). There were several students who played in more than 1 venue. Among those with IGD, there was a greater proportion who played in other venues, while among those without IGD, playing at home predominated and the difference was significant (Table 2).

Association of IGD with Depression

Table 3 shows the multiple logistic regression of the association of IGD with depression. The following variables were included in the analysis: age, gender, monthly household income, average weekly allowance, cost of gaming, accessibility to computer/ gadget, type of internet games, frequency of internet gaming, duration of gaming during weekdays and

Table 1. Distribution of age, grade level, gender, and school type of adolescent gamers with IGD and without IGD.

Factors	With IGD n=6 No. (%)	Without IGD n=554 No. (%)	p-value
Age (years)	17.25 (±.96)	15.97 (±1.45)	.078
Grade level			.250
8	0 (0%)	89 (16.1%)	
9	0 (0%)	103 (18.6%)	
10	1 (16.7%)	99 (17.9%)	
11	4 (66.7%)	136 (24.5%)	
12	1 (16.7%)	127 (22.9%)	
Gender			.783
Male	3 (60.0%)	215 (39.9%)	
Female	2 (40.0%)	277 (51.4%)	
LGBTQ	0 (0%)	47 (8.7%)	
School type			.674
Regular	5 (83.3%)	387 (69.9%)	
Science	1 (16.7%)	167 (30.1%)	
Monthly household income			.388
Low income	3 (60.0%)	312 (69.2%)	
Middle income	1 (20.0%)	107 (23.7%)	
High income	1 (20.0%)	32 (7.1%)	
Average weekly allowance (PhP)			.675
0-100	1 (16.7%)	173 (32.8%)	
101-500	3 (50.0%)	235 (44.6%)	
501 and above	2 (33.3%)	119 (22.6%)	
Cost of internet gaming (PhP)			.353
0-100	3 (50%)	358 (68.5%)	
101-500	2 (33.3%)	91 (17.4%)	
501 and above	1 (16.7%)	74 (14.1%)	

weekends/ holidays, and venue for playing. There were 336 adolescent gamers with complete data that were included in the analysis. After controlling the effect of confounders, IGD is not statistically associated with depression, while gender is a significant predictor of depression. The odds of depression were 2.5 times more likely among females as compared to males, with a 95% confidence interval of 1.432 to 4.484 and p-value <0.05. The odds of depression were 3% lower among those with IGD as compared those without IGD. However, it is not statistically significant (OR .971, 95% CI .085 - 11.084, p-value > 0.05). The result shows that there is no significant association between IGD and depression among adolescent gamers.

Association of IGD with Anxiety

Table 4 shows the multiple logistic regression of the association of IGD with anxiety. There were 336 adolescent gamers included in the analysis. After controlling the effect of confounders, IGD is not statistically associated with anxiety (p-value > 0.050). The result shows that there is no significant association between IGD and anxiety among adolescent gamers.

Table 2. Distribution of access to gadget, type of internet games, frequency of playing internet games and duration of internet games during weekdays and weekends/holidays and venue for playing among adolescent gamers with IGD and without IGD.

Gaming factors	With IGD n=6 No. (%)	Without IGD n=554 No. (%)	p-value
Access to gadget			
Cellphone	5 (83.3%)	490 (88.4%)	.525
Other gadgets	2 (33.3%)	232 (41.9%)	1.00
Type of Internet Games			
First-person shooter game (FPS)	4 (66.7%)	213 (38.4%)	.213
Real-time strategy game (RTS)	1 (16.7%)	112 (20.2%)	1.00
Massively multiplayer online game (MMO)	1 (16.7%)	161 (29.1%)	.678
Multiplayer online battle arena game (MOBA)	4 (66.7%)	272 (49.1%)	.444
Battle Royale games (BRG)	1 (16.7%)	168 (30.4%)	.673
Multi-User Dungeon (MUD)	0 (0%)	15 (2.7%)	1.00
Others	2 (33.3%)	139 (25.1%)	.645
Frequency of playing internet/online games per day			
≥2 times a day	6 (100.0%)	214 (39.8%)	.004*
<2 times /day	0 (0%)	324 (60.2%)	
Duration of playing internet games per day			
Weekdays			.376
> 2 hours	3 (50.0%)	163 (30.3%)	
≤ 2 hours	3 (50.0%)	375 (69.7%)	
Weekends/Holidays			.090
> 2 hours	6 (100%)	343 (62.8%)	
≤ 2 hours	0 (0%)	203 (37.2%)	
Venue of playing			
Home	4 (66.7%)	525 (94.8%)	.039*
Other venue	2 (33.3%)	72 (13.0%)	.182

Note. * Fisher's exact test p-value <0.05 is significant

Association of IGD with Stress

Table 5 shows the multiple logistic regression of the association of IGD with stress. Upon adjusting for confounding variables, there is no significant association between Internet Gaming Disorder (IGD) and stress. However, gender and engagement in playing First-Person Shooter (FPS) games emerge as significant predictors of stress. The odds of stress were 4 times more likely among LGBTQ adolescent gamers as compared to males, with a 95% confidence interval of 1.452 to 10.454 and p-value <0.05. The odds of stress were also 2 times among those who play FPS (OR 1.746, 95% CI 1.007-3.025) as compared to those who did not play FPS. Moreover, the odds of stress were 6 times more likely among those with IGD as compared to without IGD. However, it is not statistically significant (OR 6.135, 95% CI .373-100.991 and p-value > 0.05). The result shows that there is no significant association between IGD and stress among adolescent gamers.

Association of IGD with both Depression and Anxiety

Table 8 shows the multiple logistic regression of the association of IGD with both depression and anxiety. After controlling the effect of confounders, IGD was not associated with both depression and anxiety, but age and gender were significant predictors of both depression

Table 3. Multiple logistic regression of the association of IGD with depression.

Factors	Adjusted OR	95% C.I.for aOR		p-value
		Lower	Upper	
Age	1.133	.951	1.348	.162
Gender				
Male	Ref			
Female	2.534	1.432	4.484	.001*
LGBTQ	2.789	.936	8.316	.066
Monthly household income				
Low income	Ref			
Middle income	.913	.490	1.699	.773
High income	1.581	.528	4.735	.413
Average weekly allowance				
PHP 0-100	Ref			
PHP 101-500	.806	.449	1.448	.471
≥PHP501	.959	.446	2.059	.914
Cost of internet gaming				
PHP 0-100	Ref			
PHP 101-500	1.653	.817	3.345	.163
≥PHP501	1.476	.671	3.247	.334
Access to gadget				
Cellphone	.768	.312	1.895	.567
Other gadgets	.742	.346	1.589	.442
Type of Games				
FPS	1.056	.587	1.897	.856
RTS	1.194	.847	1.681	.311
MMO	.847	.467	1.538	.586
MOBA	1.017	.884	1.169	.817
BRG	.999	.886	1.127	.991
MUD	.851	.657	1.102	.222
Others type of game	1.038	.944	1.142	.441
≥2 times per day of gaming	.603	.352	1.035	.066
>2 hours gaming on weekdays	1.708	.918	3.177	.091
>2 hours gaming on weekends	1.058	.580	1.931	.854
Type of venue for internet gaming				
Home	.431	.061	3.029	.398
Other venues	.687	.292	1.615	.389
With IGD	.971	.085	11.084	.981

Note. *p-value <0.05 is significant

and anxiety. For every year increase in age, the odds of both depression and anxiety increased by 19.4%. The odds of both depression and anxiety were 3 times more likely among females as compared to males (95% confidence interval of 1.696 to 5.297, p-value <0.05). Moreover, the odds of both depression and anxiety were 1.027 times higher among those with IGD as compared to without IGD (95% CI .089-11.846 and p-value > 0.05). The result show that there is no significant association between IGD and both depression and anxiety among adolescent gamers.

Discussion

The findings of this study indicated that Internet Gaming Disorder had a very low prevalence among adolescent gamers. The IGD prevalence was low as compared to nearby Asian countries, with a range from 13.8% to 15.5%.[15,28] Moreover, this prevalence was very low as compared to the reports of local studies, with a range from 10.4% to 54.76%.[16,17,18,19]

Many factors could have contributed to the difference in results. The low prevalence of IGD could be attributed to the new definition of IGD based on DSM-5-TR by the American Psychiatric Association with 5 criteria endorsed as most often out of 9 criteria. Moreover, present study demographic was limited to adolescent gamers from two public high schools in Pasay City. Variations could also be explained by differences in gaming culture and access to gaming devices and the internet. Furthermore, the differences in the methods employed to evaluate IGD could also have influenced the findings.

Table 4. Multiple logistic regression of the association of IGD with anxiety.

Factors	Adjusted OR	95% C.I.for aOR		p-value
		Lower	Upper	
Age	1.165	.871	1.559	.304
Gender				
Male	Ref			
Female	2.424	.983	5.980	.055
LGBTQ	4.549	.506	40.909	.176
Monthly household income				
Low income	Ref			
Middle income	.795	.278	2.275	.668
High income	.385	.083	1.791	.224
Average weekly allowance				
PHP 0-100	Ref			
PHP 101-500	1.179	.492	2.825	.712
≥PHP501	3.834	.849	17.307	.081
Cost of internet gaming				
PHP 0-100	Ref			
PHP 101-500	1.320	.390	4.465	.655
≥PHP501	1.589	.392	6.449	.517
Access to gadget				
Cellphone	.470	.086	2.567	.384
Other gadgets	.552	.167	1.825	.330
Type of Games				
FPS	1.579	.580	4.297	.372
RTS	.670	.407	1.104	.116
MMO	.859	.319	2.312	.764
MOBA	1.020	.812	1.282	.865
BRG	1.118	.906	1.381	.298
MUD	.895	.598	1.338	.588
Others type of game	1.034	.890	1.202	.661
≥2 times per day of gaming	1.056	.434	2.567	.905
>2 hours gaming on weekdays	1.513	.521	4.397	.447
>2 hours gaming on weekends	1.257	.483	3.271	.639
Type of venue for internet gaming				
Home	.000	0.000		.999
Other venues	.963	.230	4.041	.959
With IGD	59977186.980	0.000		.999

The study identified that playing internet games 2 or more times per day and playing online games at home was associated with IGD. Frequent playing of online games increased the risk of IGD. This result agrees with the study that showed frequency of internet gaming was a risk factor for IGD.[16] While playing at home was protective for IGD because it decreased the risk for IGD. The adolescent gamers who played at home may have different accessibility to the gadget and internet connection. Moreover, most young people came from families with low incomes and this may have limited their access to internet gaming at home. However, this result contrasts with the previous studies that showed no significant association between the venue and IGD.[16,18] This may be due to the inaccessibility of gadgets and the internet, so that the adolescent could play anywhere and may increase their risk of IGD.

Association of IGD with Depression

Based on the result of the current study, the odds of depression among those with IGD were higher as compared to no IGD. However, it was not statistically significant (p-value > .05). This contrasts with the studies that showed a significant positive low correlation of online games to depression.[14,17,29,30] This may be due to the differences between the tools, definitions used in determining IGD, and the population in previous studies. Nonetheless, the prevalence of depression among adolescent gamers in this study was moderate (67%), suggesting

Table 5. Multiple logistic regression of the association of IGD with s-tress.

Factors	Adjusted OR	95% C.I.for aOR		p-value
		Lower	Upper	
Age	.938	.797	1.104	.439
Gender				
Male	Ref			
Female	1.604	.935	2.752	.086
LGBTQ	3.897	1.452	10.454	.007*
Monthly household income				
Low income	Ref			
Middle income	1.053	.588	1.886	.862
High income	1.086	.413	2.854	.868
Average weekly allowance				
PHP 0-100	Ref			
PHP 101-500	1.115	.642	1.938	.699
≥PHP501	1.720	.842	3.511	.137
Cost of internet gaming				
PHP 0-100	Ref			
PHP 101-500	1.596	.839	3.035	.154
≥PHP501	1.446	.694	3.014	.325
Access to gadget				
Cellphone	.509	.225	1.151	.105
Other gadgets	.866	.423	1.771	.693
Type of Games				
FPS	1.746	1.007	3.025	.047*
RTS	.958	.697	1.318	.794
MMO	1.549	.888	2.703	.123
MOBA	1.032	.906	1.177	.635
BRG	.937	.836	1.051	.266
MUD	.859	.657	1.123	.266
Others type of game	.969	.887	1.058	.482
≥2 times per day of gaming	1.227	.736	2.046	.433
>2 hours gaming on weekdays	1.100	.624	1.938	.742
>2 hours gaming on weekends	.801	.451	1.423	.449
Type of venue for internet gaming				
Home	6.616	.793	55.193	.081
Other venues	1.306	.574	2.975	.525
With IGD	6.135	.373	100.991	.204

Note. *p-value <0.05 is significant

potential negative effects that warrant interventions and additional research to mitigate its harmful consequences.

Association of IGD to Anxiety

This study shows that adolescent gamers with IGD were at risk of anxiety. Among those with IGD, all of them had anxiety, however, it was not conclusive (p-value > .05). This is in contrast with the results of the studies that showed a significant positive low correlation with anxiety with IGD.[9,14,29,30,31]

Despite the lack of significant association between IGD and anxiety, anxiety was very high among adolescent gamers, which manifested into health illness and symptoms such as body aches and headaches. This shows the importance of early and timely assessment of risk factors and implementation of effective ways of reducing the incidence and impact of IGD and anxiety among adolescents.

Association of IGD to Stress

This study found that the odds of stress among those who had IGD were higher as compared to those with no IGD, however, it was not statistically significant. This is is not aligned with the previous study that showed the association between IGD and stress.[32] However, this study demonstrated a higher prevalence of stress (46%) among adolescent gamers

Table 6. Multiple logistic regression of the association of IGD with depression and anxiety.

Factors	Adjusted OR	95% C.I.for aOR		p-value
		Lower	Upper	
Age	1.194	1.003	1.420	.046*
Gender				
Male	Ref			
Female	2.997	1.696	5.297	.001*
LGBTQ	2.815	.989	8.013	.053
Monthly household income				
Low income	Ref			
Middle income	.945	.507	1.761	.859
High income	1.319	.460	3.783	.607
Average weekly allowance				
PHP 0-100	Ref			
PHP 101-500	.856	.480	1.528	.599
≥PHP501	.967	.454	2.063	.932
Cost of internet gaming				
PHP 0-100	Ref			
PHP 101-500	1.924	.944	3.921	.071
≥PHP501	1.699	.771	3.742	.189
Access to gadget				
Cellphone	.693	.282	1.707	.426
Other gadgets	.777	.362	1.665	.516
Type of Games				
FPS	1.103	.616	1.977	.741
RTS	1.131	.806	1.588	.476
MMO	.911	.503	1.648	.757
MOBA	1.029	.895	1.182	.689
BRG	1.010	.896	1.139	.868
MUD	.857	.661	1.110	.241
Others type of game	1.045	.951	1.148	.360
≥2 times per day of gaming	.656	.383	1.123	.124
>2 hours gaming on weekdays	1.635	.886	3.019	.116
>2 hours gaming on weekends	1.050	.577	1.908	.874
Type of venue for internet gaming				
Home	.401	.056	2.861	.362
Other venues	.795	.338	1.874	.600
With IGD	1.027	.089	11.846	.983

Note. *p-value <0.05 is significant

as compared to previous studies with a range from 25-36.5%.[30,33,34] Further investigation is required to explore the risk factors associated with Internet Gaming Disorder (IGD) and stress among adolescents, as these factors can significantly impact their physical health and overall well-being.

Association of IGD to both Depression and Anxiety

Adolescents with IGD had higher odds of both depression and anxiety as compared to those with no IGD, though, not statistically significant. This is in contrast to previous studies that showed a significant association of anxiety, depression and IGD.[29,31] Despite the lack of significant association of IGD to both depression and anxiety, adolescent gamers were at high risk for multiple mental health burdens and thus needed interventions and further research to prevent its negative effects.

Limitations

One limitation of the study was the utilization of a cross-sectional study design, which did not provide sufficient evidence to establish causality and directionality in the associations between factors influencing Internet Gaming Disorder (IGD) and its impact on depression, anxiety, both depression and anxiety, and stress in adolescents. The use of a self-administered questionnaire may have resulted in reporting bias and underreporting of the prevalence of mental health disorders among teenagers.

However, despite the shortcomings of the study design, the DASS-21 and IGDDS9-SF questionnaires were acceptable, appropriate and reliable screening instruments for depression, anxiety, stress, and IGD.

Implications

Overall, this study added to the knowledge of the local prevalence of IGD using the new definition based on DSM-5-Text Revision of the American Psychiatric Association. In addition, this is the first local study among adolescent gamers from selected public high schools in Pasay City. Moreover, this study added to the knowledge of the association of IGD and depression, anxiety, and stress among adolescents. Furthermore, the data provided by the study would help the school administrators to be able to appropriately plan a course of action to prevent the negative effects of problematic internet gaming.

Conclusion

In conclusion, this study showed that adolescents in 2 high schools had a very low prevalence of Internet Gaming Disorder, moderate prevalence of depression, stress and both depression and anxiety, and a high prevalence of anxiety. Adolescent gamers who played 2 or more times per day were also at risk of IGD while those who played at home were also less likely to have IGD. Finally, the odds of depression, anxiety, stress and both depression and anxiety were higher among those with IGD as compared to those with no IGD. However, the association of IGD with depression, anxiety, stress, and both depression and anxiety were not statistically significant. Hence, the null hypothesis is not rejected.

In light of the conclusion, the researcher proposes the following recommendations for future studies:

1. Conduct further research with a larger sample size, enhanced geographical representation, and longitudinal studies to explore additional associated risk factors of Internet Gaming Disorder (IGD), depression, anxiety, and stress, aiming to establish causal relationships among these factors.

2. Improve the response rate by designing a personalized survey template that is both easily understandable and user-friendly. Additionally, seek assistance from school heads to encourage participation and consider providing incentives or tokens to respondents.

3. Reevaluate the criteria defining IGD in the local cultural and social context. Validate the content of the assessment tool by consulting local psychiatrists, psychologists, and pediatricians.

For school administrators, increasing awareness and early screening of the presence of IGD, depression, anxiety, stress, and both depression and anxiety among adolescents in public and private high schools are needed to prevent the negative effects.

For policy makers, creating programs and interventions for different ages and genders in schools and homes will provide targeted interventions to decrease the frequency of internet gaming and manage depression, anxiety, stress and IGD among adolescents.

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References

1. STATISTA (2021). Southeast Asia gamer numbers by country. Von Kameke. Retrieved from URL https://www.statista.com/statistics/503518/southeast-asia-number-gamers-by-country/
2. Sompinmake J. (2015, October 8) Key data you need to know about southeast asia's casual gamers. Retrieved from URL https://www.techinasia.com/talk/key-data-southeast-asias-casual-gamers
3. STATISTA (2022). Global Digital population as of April 2022. https://statista.com
4. Grinspoon P. (2020 December 22). The health effects of too much gaming. https://health.harvard.edu/blog/the-haelth-effects-of-too-much-gaming-2020122221645
5. Huard Pelletier V, Lessard A, Piché F, et al. Video games and their associations with physical health: a scoping review. BMJ Open Sport & Exercise Medicine 2020;0: e000832. doi:10.1136/bmjsem-2020-000832

6. The Hong Kong Polytechnic University (PolyU). (2013 September 5). PolyU expert studies the health effects of using portable electronic devices. https://www.asiaresearchnews.com/html/article.php/aid/7861/cid/2/research/medicine/the_hong_kong_polytechnic_university/polyu_expert_studies_the_health_effects_of_using_portable_electronic_devices.html
7. American Psychiatric Association (2022). Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision. Washington, DC, American Psychiatric Association.
8. Mentzoni RA, Brunborg GS, Molde H, et al. Problematic video game use: Estimated prevalence and associa-tions with mental and physical health. Cyberpsychol Behav Soc Netw 2011;14: 591–6.
9. Huang X, Shi H-x, Li H-q, Guo W-j, Luo D and Xu J-j. Differential effects of anxiety on internet gaming disorder: A large-scale cross-sectional survey. Front. Psychiatr 2022. 12:802513. https://doi.org/ 10.3389/fpsyt.2021.802513
10. Saunders JB, Hao W, Long J, et al. Gaming disorder: Its delineation as an important condition for diagnosis, management, and prevention. J Behav Addict 2017; 6(3): 271–9. https://doi.org/10.1556/2006.6.2017.039
11. Gentile DA, Bailey K, Bavelier D. Internet gaming disorder in children and adolescents. Pediatrics 2017; 140(Suppl 2), S81–S85. https://doi.org/10.1542/peds.2016-1758H
12. Rehbein F, Kliem S, Baier D, Mößle T & Petry NM. Prevalence of Internet gaming disorder in German adolescents: diagnostic contribution of the nine DSM-5 criteria in a state-wide representative sample. Addiction (Abingdon, England) 2015; 110(5): 842–51. https://doi.org/10.1111/add.12849
13. Király O, Griffiths MD, Urbán R, et al. Problematic internet use and problematic online gaming are not the same: findings from a large nationally representative adolescent sample. Cyberpsychol Behav Social Netw 2014; 17(12): 749–54. https://doi.org/10.1089/cyber.2014.0475
14. Wang Y, Liu B, Zhang L & Zhang P. Anxiety, depression, and stress are associated with internet gaming disorder during COVID-19: Fear of missing out as a mediator. Front Psychiatr 2022; 13: 827519. https://doi.org/10.3389/fpsyt.2022.827519
15. Kim NR, Hwang SS, Choi JS, et al. Characteristics and psychiatric symptoms of internet gaming disorder among adults using self-reported DSM-5 criteria. Psychiatr Invest 2016; 13(1): 58–66. https://doi.org/10.4306/pi.2016.13.1.58
16. Mejia M. Internet gaming disorder in Filipino male adolescents: Risk factors and gaming motives. Cardinal Santos Medical Center Research Abstract Compendium. San Juan, Philippines. 2020.
17. Labana RV, Hadjisaid JL, Imperial AR, Jumawid KE, Lupague M & Malicdem DC. Online fame addiction and the level of depression among adolescents in Manila, Philippines. Central Asian J Global Health 2020; 9(1): e369. https://doi.org/10.5195/cajgh.2020.369
18. Reyes M. Risk factors of Internet Gaming among Filipino students. Humanities & Social Sciences Reviews 2020; 8(4): 230-7, https://doi.org/10.18510/hssr.2020.8424
19. Rodriguez D, Shen N, Gouveia M, Yap M and Estrada M. Level of addiction to gaming and risk depression among 15–19-year-old gamers in Cavite, Philippines. J Health Adventist University of the Philippines 2021; 4.
20. Barbon W. Some factors associated with video game addiction of Filipinos found during the COVID-19 pandemic. DLSU Research Congress 2021. De La Salle University, Manila, Philippines. July 7 to 9, 2021. https://www.dlsu.edu.ph/wp-content/uploads/pdf/conferences/research-congress-proceedings/2021/SEP-13.pdf
21. Pontes HM, Macur M & Griffiths MD. Internet gaming disorder among Slovenian primary schoolchildren: Findings from a nationally representative sample of adolescents. J Behav Addict 2016; 5(2): 304–10. https://doi.org/10.1556/2006.5.2016.042
22. Monacis L, Palo V, Griffiths MD & Sinatra M. Validation of the Internet gaming disorder scale- Short-form (IGDS9-SF) in an Italian-speaking sample. J Behav Addict 2016; 5(4): 683–90. https://doi.org/10.1556/2006.5.2016.083
23. Evren C, Dalbudak E, Topcu M, Kutlu N, Evren B & Pontes HM. Psychometric validation of the Turkish nine-item Internet Gaming Disorder Scale-Short Form (IGDS9-SF). Psychiatr Res 2018; 265: 349–54. https://doi.org/10.1016/j.psychres.2018.05.002
24. Mordeno IG, Navarro RA & Generalao JG. Examining the DSM-5 internet gaming disorder criteria in Filipino gamers: A Factor- and Person-centered approach. Int J Ment Health Addiction 2022. https://doi.org/10.1007/s11469-022-00759-4
25. Poon LYJ, Tsang HWH, Chan TYJ, et al. Psychometric properties of the internet gaming disorder scale–short-form (IGDS9-SF): Syst Rev J Med Internet Res 2021; 23(10): e26821. https://doi.org. 10.2196/26821
26. Moya E, Larson L, Stewart R, Fisher J, Mwangi M, Phiri K. Reliabilityand validity of depression anxiety stress scale (DASS)-21 in screening for common mental diKarasorders among postpartum women in Malawi. BMC Psychiatr 2022; 22(1): 352. https://doi.org/10.1186/s12888-022-03994-0
27. Henry JD & Crawford JR. The short-form version of the Depression Anxiety Stress Scales (DASS-21): Construct validity and normative data in a large non-clinical sample. Br J Clin Psychol 2005; 44(2): 227–39. https://doi.org10.1348/014466505x29657
28. Wang CW, Chan CL, Mak KK, Ho SY, Wong PW & Ho RT. Prevalence and correlates of video and internet gaming addiction among Hong Kong adolescents: a pilot study. Sci World J 2014; 874648. https://doi.org/10.1155/2014/874648
29. Alhamoud MA, Alkhalifah AA, Althunyan AK, Mustafa T, Alqahtani HA, Al Awad FA. Internet gaming disorder: Its prevalence and associated gaming behavior, anxiety, and depression among high school male students, Dammam, Saudi Arabia. J Fam Comm Med 2022; 29(2): 93-110.1https://doi.org/ 10.4103/jfcm.jfcm_48_22

30. Fazeli S, Zeidi I, Lin C, Namdar P, Griffiths M, Ahorsu D, Pakpour A. Depression, anxiety, and stress mediate the associations between internet gaming disorder, insomnia, and quality of life during the COVID-19 outbreak. Addictive Behaviors Reports 2020; 12: 100307. https://doi.org/10.1016/j.abrep.2020.100307.
31. Burkauskas J, Griskova-Bulanova I, Doric A, et al. Association of internet gaming disorder symptoms with anxiety and depressive symptoms and substance use: an international cross-sectional study. Middle East Curr Psychiatry 2022; 29: 14. https://doi.org/10.1186/s43045-022-00180-6
32. Lin C, Potenza M, Broström A, Pakpour A. Internet gaming disorder, psychological distress, and insomnia in adolescent students and their siblings: An actor-partner interdependence model approach, Addictive Behaviors Reports 2021; 13. https://doi.org/10.1016/j.abrep.2020.100332.
33. Labrague L. Facebook use and adolescents' emotional states of depression, anxiety, and stress. Health Sci J 2014: 8(1).
34. Nochaiwong S, Ruengorn C, Thavorn K, Hutton B, Awiphan R, Phosuya C, Ruanta Y, Wongpakaran N & Wongpakaran T. Global prevalence of mental health issues among the general population during the coronavirus disease-2019 pandemic: a systematic review and meta-analysis. Sci Reports 2019; 11(1): 10173. https://doi.org/10.1038/s41598-021-89700-8

An analytical cross-sectional study on the association between animal companionship and anxiety among students of a private medical school in Quezon City

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Abstract

Introduction Constant stress predisposes medical students to anxiety. The study aimed to determine the association between animal companionship and anxiety among medical students at UERMMMCI.

Methods The study utilized an analytical cross-sectional design via an online form with the anxiety portion of the HADS questionnaire. Participants included first to third year medical students of a private medical school.

Results A total of 161 responses were recorded. Sex and year-level exhibited significant association with anxiety. Those with anxiety were 2.71 times more likely to be females ($p = 0.007$). Stratification showed that those with anxiety were 1.72 times less likely to be females with pets ($p = 0.37$) while, in contrast, those with anxiety were 3.64 times more likely ($p = 0.02$) to be males with pets. Those with anxiety were likely to belong to first and second-years ($p = 0.01$ and $p = 0.06$), respectively and pet owners, though, not statistically significant ($p = 0.357$).

Conclusion An association between sex and year-level with anxiety was noted. Those with anxiety were likely to be females, first-years, and males with animal companionship. Although they did not reach statistical significance.

Key words: Anxiety, companionship, animals, medical student, hospital anxiety and depression scale

Approximately 1 in 3 medical students worldwide suffer from anxiety.[1] This rate is significantly higher compared to that observed in the general population which is 3-4% of the total population as of 2017.[2] While there are numerous risk factors predisposing an individual to the development of anxiety, constant stress and increased academic workload may render medical students more vulnerable to anxiety.[3]

There were multiple health programs developed to mediate the effects of anxiety and stress like the utilization of animals such as trained therapy dogs to decrease anxiety levels among medical students.[4] Interaction with personal pets as opposed to trained animals as a way to mediate anxiety have not been thoroughly evaluated, particularly in the case of medical students. Animal companionship has shown

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positive impacts on both the physical and psychological well-being of humans. It has been observed that not only can animals help an individual navigate through trying times, they also reduce the levels of anxiety, depression, and loneliness, which has a similar effect as a relaxing activity (e.g., quiet reading) on a person's psychological well-being.[5,6] In addition to this, college students who grew up as pet owners had higher social support but also had greater internalizing symptoms (sadness, anxiety, and loneliness) throughout their college stay.[7] Mental health is currently a relevant topic among Filipinos. While multiple resources are available regarding the status of other mental health disorders such as depression, scarce data exist regarding the true prevalence of anxiety among Filipinos. In Asia, Filipinos are recognized to have the highest rate of pet ownership.[8] However, few published studies have assessed the possible significance of animal companionship with regards to the psychological well-being of Filipinos as most studies on the benefits of animals on human health are focused on college students and certain vulnerable groups such as children, elderly, and individuals with chronic illnesses and disabilities.

This study addressed that gap in information and provides insight into the current prevalence of anxiety among Filipino medical students. It aimed to determine the association between animal companionship and anxiety among medical students in a private medical school in the Philippines. Specifically, the researchers sought to determine and compare the prevalence of anxiety among medical students in terms of sex, year level, and type of pet.

Methods

An analytical cross-sectional study was conducted via online survey with first-, second-, and third-year medical students at a private medical school as the study participants. This research was approved by the UERMMMCI Ethics Review Committee. The sample size was determined using the sampling size formula of difference of two proportions, utilizing results from a cross-sectional study on the possible influence of pet ownership on the psychological well-being of Chinese people.[9] The final sample size was 161.

Participants were recruited via convenience sampling. The subjects included in this study were individuals who are either a first-, second-, or third-year medical student and were enrolled during the first semester of the academic year 2022-2023 in the College of Medicine.

The Hospital Anxiety and Depression Scale (HADS) questionnaire was used for the detection of anxiety and depression disorders. It is composed of 7 questions each for anxiety and depression by which participants were asked to rate its applicability based on their experiences through a 4-point Likert scale. Total score for HADS range from 0-42.. One study which assessed the validity of HADS among medical students concluded HADS was a good tool for identifying medical students that had depression or anxiety based on the area under the curve (AUC) value of 0.936 for the depression subscale and 0.948 for the anxiety subscale.[10] The scoring of HADS would be 0-7 as normal, 8-10 as borderline anxiety, while 11-21 would be considered a clear case of anxiety.[11] A cut-off score of 8 or higher had a 0.80 sensitivity and specificity for detecting the presence of anxiety and depression.[12] Therefore, in this study, participants identified as "borderline anxiety" or "abnormal" were considered as "with Anxiety".

Subjects who participated in the study were divided into two groups: with animal companion and without animal companion. Individuals with animal companions must spend at least 10 minutes per day with their pets to be classified as "with animal companion", as this was the minimum amount of time spent with pets identified to cause a decrease in the self-reported level of anxiety among university students.[13] Prevalence odds ratio (POR) was used to determine the association between animal companionship and the prevalence of anxiety. Chi-square test was used to determine statistical significance. To address the possible effects of confounding variables such as sex, year-level, and type of pet, association of these variables with anxiety were also determined using POR. For the bivariate analyses that showed significant association, logistic regression and stratified analysis was done to compute the adjusted ratio.

Results

A total of 161 participants answered the questionnaire and their baseline characteristics are shown in Table 1. There were more females (65.8%) than males and almost half were third year medical students (47.8%). Most had an animal companion (70.8%) with dogs as the most common type of pet (64.6%).

Table 1. Sociodemographic characteristics of the participants (n=161).

Characteristics	n (%)
Sex	
Male	55 (34.2)
Female	106 (65.8)
Year-Level	
1st	42 (26.1)
2nd	42 (26.1)
3rd	77 (47.8)
Animal Companion	
With Animal Companion	114 (70.8)
Without Animal Companion	47 (29.2)
Type of Pet	
Dog	104 (64.6)
Cat	25 (15.5)
Fish	7 (4.3)
Others (Bird, Guinea Pig, Turtle)	5 (3.1)
Overall Prevalence	
Normal	53 (32.9)
With Anxiety	108 (67.1)
Borderline Abnormal	48 (29.8)
Abnormal	60 (37.3)

Table 2 shows that among the factors included, only sex and year-level were found to be significantly associated with anxiety. Among those with anxiety, they were 2.97 times more likely to be females (p = 0.002, 95% CI 1.49, 5.91) and were more likely to be first years and second years (POR= 3.36, p = 0.01, 95% CI 1.38, 8.20 and POR=2.23)respectively. These findings however did not reach statistical significance. Lastly, those with anxiety were 1.82 times most likely those with animal companions, however, this association was not significant (p = 0.095, 95% CI 0.90, 3.68).

The adjusted ratios of these three factors all showed a positive association with anxiety, but only sex and year-level were found to be significantly associated. These were being females, being second and third years and with animal companions.

Stratified analysis on the effect of gender on animal companionship and anxiety is shown in Table 3. Among those who were anxious, they were less likely to be females, but, were likely to be males.

As shown in Table 4, the type of pet also did not yield a significant association with anxiety. Compared to those with "other" types of pets, which included birds, guinea pigs, and turtles, those with anxiety were more likely to be dog owners, cat owners and fish owners.

Table 2. Factors associated with anxiety.

	With Anxiety (n = 108)	Without Anxiety (n = 53)	POR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
Animal Companion						
With Animal Companion	81 (71.1)	33 (28.9)	1.82 (0.90, 3.68)	0.095	1.43 (0.67, 3.05)	0.357
Without Animal Companion	27 (57.4)	20 (42.6)				
Sex						
Female	80 (75.5)	26 (24.5)	2.97 (1.49, 5.91)	0.002	2.71 (1.31, 5.59)	0.007
Male	28 (50.9)	27 (49.1)				
Year-Level						
First	34 (81)	8 (19)	3.36 (1.38, 8.20)	0.01	3.2 (1.28, 8.02)	0.01
Second	31 (73.8)	11 (26.2)	2.23 (0.98, 5.07)	0.06	2.26 (0.97, 5.29)	0.06
Third	43 (55.8)	34 (44.2)	1.00 (ref)		1.00 (ref)	

Table 3. Stratified analysis on the effect of gender on animal companionship and anxiety.

		With Anxiety (n = 80)	Without Anxiety (n = 26)	OR (95% CI)	p-value
Female	With Animal Companion	61 (73.5)	22 (26.5)	0.58 (0.18, 1.91)	0.37
	Without Animal Companion	19 (82.6)	4 (17.4)		
		With Anxiety (n = 28)	Without Anxiety (n = 27)	OR (95% CI)	p-value
Male	With Animal Companion	20 (64.5)	11 (35.5)	3.64 (1.18, 11.18)	0.02
	Without Animal Companion	8 (33.3)	16 (66.7)		

Table 4. Logistic regression for type of pets.

Type of Pets	With Anxiety (n = 101)	Without Anxiety (n = 40)	POR (95% CI)	p-value
Dog	73 (70.2)	31 (29.8)	1.57 (0.25, 9.86)	0.63
Cat	19 (76)	6 (24)	2.11 (0.28, 15.77)	0.46
Fish	6 (85.7)	1 (14.3)	4 (0.25, 63.95)	0.33
Others	3 (60)	2 (40)	1.00 (ref)	

Discussion

The study showed that presence of anxiety is 1.43 times more likely to be experienced by medical students with animal companions than those without, although, this was not statistically significant. Studies in the past have shown the positive effects of animal companionship on reducing anxiety, but recent studies are emerging that show that the effects of pet ownership on mental health are much more varied. Studies suggest that the relationship between pet ownership and mental health is complicated and at times negative.[14,15] The belief that pets are good for mental health may cause pet owners to rely more on their pets rather than human support, and dependence on pets has been linked to higher mental health burdens due to decreased comfort in depending on or trusting people and a greater anxiety of being rejected or unloved by other people.[15,16] One study found that pet owners had poorer mental health and were more anxious compared to non-pet owners, but when confounders were considered, they found that there were no significant associations between pet ownership and mental health.[17]

Examining the association between types of pets and anxiety revealed that the probability of anxiety was 4 times higher in fish owners than owners of "other" pets. The probability of anxiety among cat owners and dog owners over "other" pet owners were 2.11 times greater and 1.57 times greater, respectively. However, these results were not significant, which may be attributed to a small sample size or limited respondents from fish owners and "other" pet owners. Additionally, they discovered that among the two groups, dog owners reported higher levels of perceived social support, companionship, and unconditional love from their pets, whereas cat owners reported greater interaction and lower associated costs with their pets.[18]

Another study found that while pet owners, dog owners specifically, were able to receive great support and companionship from their pets, they were also more likely to have poorer mental health. They were unsure if poorer mental health prompted people to acquire dogs or if taking care of dogs resulted in poorer mental health. However, they theorized that

anticipatory grief over loss of a dog and concern regarding the burden of responsibility and being unable to meet their dog's needs may participate in the development of depression and anxiety in dog owners.[19] This may explain why dog owners have an increased probability of anxiety over "other pets" despite the greater social support and interaction they receive from their dogs, and may possibly explain why cat owners, who also receive great social support and interaction from their cats, have an increased probability of anxiety over "other pets."

In a study that induced anxiety in students through a public speaking task, some students (experimental group) were presented with interventions in the form of a dog, fish, or plant, while no intervention was provided to other students (control group). After 5 minutes, anxiety measures were collected, revealing reduced anxiety levels in all experimental groups. However, there was no statistical difference observed among the experimental groups, suggesting that the type of pet may not significantly impact the prevalence of anxiety in students.[20] An examination on the association between sex and anxiety revealed that there was an association between female sex and anxiety. This is consistent with other studies that also reported that there is a significant difference on the prevalence of anxiety across sex or gender, with females exhibiting higher scores on the Generalized Anxiety Disorder 7 (GAD-7) Questionnaire as well as higher rates of anxiety, depression, and high stress levels compared to males.[21,22,23,24] One study attributed this to a number of factors such as biological influences, behavioral and cognitive factors, as well as environmental factors.[25]

A stratified analysis was done to examine the association of animal companionship among females and males and anxiety. Results demonstrated that for females, there was an inverse relationship between anxiety and animal companionship, which could point to the possibility that animal companionship was beneficial in lowering the prevalence of anxiety among the group. As for the males results showed positive relationship to anxiety. It may be inferred that the relationship is not beneficial in that having an animal companion poses a higher risk of anxiety for males.

With regards to year-level, other studies showed conflicting results, with one reporting no significant difference in the prevalence of anxiety across year-levels while another found that the prevalence of anxiety was highest among second year medical students, followed by first years and lastly, third years.[1,26]

One of the limitations of this current study is that participants with pre-existing anxiety were not excluded, potentially impacting the study results. For future research, it is recommended to identify factors that could contribute to anxiety so as not to affect the results.

In conclusion, more than half of the participants of this study screened positive for anxiety. This study found a significant positive association between sex and anxiety, with female medical students more likely to have anxiety than males. Upon stratified analysis, a significant positive association was found between males with animal companions and anxiety. For females, a negative association was observed between animal companionship and anxiety, but this was not significant. A significant positive association was also observed between year-levels and anxiety, with first year medical students more likely to have anxiety compared to those in the upper years. On the other hand, a positive association with anxiety was observed for both animal companionship and type of pet, but these associations were not statistically significant.

References

1. Quek TT, Tam WW, Tran BX, et al. The global prevalence of anxiety among medical students: A meta-analysis. Int J Environ Res Public Health 2019 Jul 31;16(15):2735. doi: 10.3390/ijerph16152735
2. World Health Organization. Depression and Other Common Mental Disorders Global Health Estimates [Internet]. World Health Organization; 2017 [cited 2021 Oct 5]. Available from: https://apps.who.int/iris/bitstream/handle/10665/254610/WHO-MSD-MER-2017.2-eng.pdf
3. Zhang C, Wang T, Zeng P, et al. Reliability, validity, and measurement invariance of the general anxiety disorder scale among Chinese Medical University Students. Front Psychiatr 2021; 12:648755. doi: 10.3389/fpsyt.2021.648755
4. Brisson S, Purkey S, Brisson M. Medical students' attitudes regarding the impact of a therapy dog program on anxiety levels: A pilot study. J Psychiatr Depress Anxiety 2017; 25; (3): 010. doi: 10.24966/PDA-0150/100010
5. Wells D. The effects of animals on human health and well-being. J Soc Issues 2009 Nov 3;65(3):523-43. doi: 10.1111/j.1540-4560.2009.01612.x
6. Wilson CC. The pet as an anxiolytic intervention. J Nerv Mental Disease 1991;179(8):482–9.

7. Barker SB, Schubert CM, Barker RT, Kuo SI, Kendler KS, Dick DM. The relationship between pet ownership, social support, and internalizing symptoms in students from the first to fourth year of college. Appl Dev Sci 2020; 24(3): 279-93. doi: 10.1080/10888691.2018.1476148. Epub 2018 Jul 24.
8. Rakuten Insight. Pet Ownership in Asia [Internet]. Rakuten Insight; 2021 [cited 2021 Oct 5]. Available from: https://insight.rakuten.com/pet-ownership-in-asia/
9. Xin X, Cheng L, Li S, Feng L, Xin Y, Wang S. Improvement to the subjective well-being of pet ownership may have positive psychological influence during COVID-19 epidemic. Animal Sci J 30 August 2021; 92(1). doi: 10.1111/asj.13624
10. Marfell NR. Measuring depression and anxiety in medical students: Is HADS an appropriate tool? [Thesis]. Cardiff [UK]: Cardiff University; 2019.
11. Mehta SP, Crochet Z, O'Dell N, Stevenson A. Hospital anxiety and depression scale. Crit Rev Phys Rehab Med 2018; 30(2):101–3.
12. Bjelland I, Dahl AA, Haug TT, Neckelmann D. The validity of the hospital anxiety and depression scale. An updated literature review. J Psychosom Res 2002 Feb;52(2):69-77. doi: 10.1016/s0022-3999(01)00296-3.
13. Pendry P, Carr AM, Gee NR, Vandagriff JL. Randomized trial examining effects of animal assisted intervention and stress related symptoms on college students' learning and study skills [Internet]. Int J Envir Res Public Health MDPI; 2020 [cited 2021Nov14]. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/
14. Picard MJ. Study of the effects of dogs on college students' mood and anxiety [Thesis]. Orono (ME): The University of Maine; 2015.
15. Kogan LR, Currin-McCulloch J, Bussolari C, Packman W, Erdman P. The psychosocial influence of companion animals on positive and negative affect during the COVID-19 pandemic. Animals 2021Jul13;11(7):2084.
16. Scoresby KJ, Strand EB, Ng Z, Brown KC, Stilz CR, Strobel K, et al. Pet ownership and quality of life: A systematic review of the literature. Vet Sci 2021 Dec 16; 8(12).
17. Denis-Robichaud J, Aenishaenslin C, Richard L, Desmarchelier M, Carabin H. Association between pet ownership and mental health and well-being of Canadians assessed in a cross-sectional study during the COVID-19 pandemic. Int J Environm Res Public Health 2022 Feb16; 19(4): 2215.
18. González-Ramírez MT, Landero-Hernández R. Pet–human relationships: Dogs versus cats. Animals 2021 Sep 20; 11(9): 2745.
19. Merkouri A, Graham TM, O'Haire ME, Purewal R, Westgarth C. Dogs and the good life: A cross-sectional study of the association between the dog–owner relationship and owner mental wellbeing. Front Psychol 2022 July 18; 13: 903647. doi: 10.3389/fpsyg.2022.903647
20. Buttelmann D & Römpke K. Anxiety-reducing rffect: Dog, fish and plant in direct comparison. Anthrozoös 2015 May 01: 27; 267-77. doi: 10.2752/175303714X13903827487647
21. Halperin S, Henderson S, Prenner S, Grauer J. Prevalence of anxiety and depression among medical students during the COVID-19 pandemic: A cross-sectional study. Sage J 2021 February 15; 8. doi: 10.1177/2382120521991150
22. Mayer F, Santos I, Silveira P, et al. Factors associated to depression and anxiety in medical students: a multicenter study. BMC Med Educ 2016; 16: 282. doi: 10.1186/s12909-016-0791-1
23. Lee C, Juarez M, Rae G, et al. Anxiety, PTSD, and stressors in medical students during the initial peak of the COVID-19 pandemic. PLoS ONE 2021 July 29; 16(7): e0255013. doi: 10.1371/journal.pone.0255013
24. Prilutskaya M, Mendualieva T & Corazza O. Emotional reactions and coping strategies of medical students during the COVID-19 pandemic: An online cross-sectional study. Science & Healthcare 2020; 22. DOI: https://doi.org/10.34689
25. Mancevska, S, Gligoroska, J, & Velickovska, L. Levels of anxiety and depression in second year medical students during COVID-19 pandemic spring lockdown in Skopje, North Macedonia. Research in Physical Education, Sport and Health 2020; 9(2), 85–92. https://doi.org/10.46733/pesh20920085
26. Inam SNB, Saqib A, Alam E. Prevalence of Anxiety and Depression among Medical Students of Private University. J Pak Med Assoc 2003 Feb; 53(2):44-7.

Association of online screen media exposure and burnout among adolescent senior high school students enrolled in different online curricula in Metro Manila: An analytic cross-sectional study

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Abstract

Introduction Due to COVID-19 pandemic, it became imperative for the education sector to shift to online curriculum and eventually hybrid education. However, this policy posed challenges to educators and students, such as increased workload, prolonged screen time, and burnout. This study determined the association of online screen media exposure and burnout among adolescent senior high school students enrolled in different online curricula in Metro Manila.

Methods This analytic cross-sectional study identified adolescent senior high school students in Metro Manila who were recruited via non-probability convenience sampling. Online screen media exposure was assessed based on the cut off value of four (4) or more hours of device usage related to online schooling, and participants answered the Copenhagen Burnout Inventory (CBI) to ascertain presence or absence of said condition. Data analysis included cross-tabulation for prevalence rate ratio (PRR), and Chi-square test for statistical significance.

Results Of the 117 respondents, most had significant online screen media exposure (75.21%). For the CBI, 51 study subjects garnered a score of 50 and above, suggesting that 43.59% of the adolescents might be suffering from burnout. In addition, PRR was calculated to be 3.9 (p-value of .002).

Conclusion Among adolescent senior high school students with significant online screen media exposure of four hours or more, there was 3.9 higher risk of exhibiting burnout symptoms, and this was statistically significant.

Key words: adolescents, online curriculum, screen media exposure, burnout

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Beginning March 2020, the COVID-19 pandemic had significantly impacted many sectors of the country, and the operations of the Philippine Department of Education (DepEd) were inadvertently affected by the stringent public health protocols set by the Department of Health (DOH). This eventually led to the complete shift of the educational system to adopt online resources and implement full online academic curricula for students under the K-12 education program. This relatively new distance learning introduced many limitations and challenges to the country's educational sector.[1]

The online curriculum involved both synchronous or asynchronous teaching-learning activities, using various internet-enabled devices, such as laptop /desktop computers, computer tablets, mobile phones, and other hand-held devices.[2,3] Across all academic year levels, students coped with this change in the educational curriculum, while some had to simultaneously attend to personal and family matters at home while online classes were ongoing.

Some students alleged that online learning made their academic load more difficult.[4] It came into play with the perception that lecturers merely handed out modules as part of self-directed learning for students and their family members, which consequently diminished the interactions between students and faculty members, thereby limiting the effectiveness of learning outcomes. Some students felt that teachers deliberately gave heavier workloads and academic requirements because students were believed to have more free time in their schedules since commuting to school was already eliminated given the full online curriculum. With the advent of online classes, tight class schedules, and a greater number of assignments and practice sessions, prolonged screen media time for internet-enabled devices eventually became a growing concern. Screen media time would refer to the duration of hours spent on diverse activities using a digital device.[5,6] For instance, screen media time encompassed unregulated hours using digital devices for educational / work purposes, leisure, and entertainment. The DepEd mandated screen time for students enrolled in online-based learning to be limited to one to four (1-4) hours per day.[6] With the introduction of online modules, students were burdened with self-paced studying, precipitating an increased risk of burnout. Burnout would be defined as a state of combined factors of exhaustion conceptualized as resulting from chronic workplace stress that had not been successfully managed.[6] One study showed that students who experienced burnout felt emotional exhaustion, which manifested as feeling irritable, worried, sad, and even depressed. If burnout was not successfully managed, it could negatively affect students' learning outcomes.[7]

Nevertheless, studies exploring burnout in association with increased screen media exposure were lacking. Thus, this study examined the association between online screen media exposure and burnout in adolescent senior high school students after the shift to online learning, by looking at the demographic profile, the proportion of students with significant online screen media exposure, the proportion of students with symptoms of burnout, and the prevalence rate ratio of online media exposure and burnout among the study subjects.

Methods

This study utilized an analytic cross-sectional design and recruited adolescent students currently enrolled in different online curricula in selected high schools in Metro Manila. This study was duly approved by the Ethics Research Committee of the UERMMMCI Research Institute for Health Sciences. Sample size for hypothesis testing for single population proportion was computed manually, and the minimum sample size required for a hypothesized proportion of 46.4% using an alpha of 0.05 in a one-tailed hypothesis was 4274. Study subjects were recruited through non-probability convenience sampling.

Included in the study were Filipino adolescents aged 13 to 19 years old, duly enrolled in selected high schools in the National Capital Region (i.e., Metro Manila) for Academic Year 2022 to 2023, which utilized blended learning (i.e., online sessions and limited face-to-face classes). In addition, these study participants should have also experienced online schooling for the previous Academic Year 2021 to 2022. Excluded were those students with existing or previously diagnosed with medical comorbidities, such as, but not limited to: (1) anxiety and other mental health conditions; (2) physical disabilities; and (3) with visual impairment or those classified to be legally blind. In addition, working students, whether part-time or full time, at the time of the study implementation were also not eligible to participate in this epidemiologic investigation.

The data collection period was from September 2022 to October 2022. Information on demographic factors and online media exposure were obtained through an online questionnaire via Google Forms. This study measured the proportion of subjects who presented with symptoms suggestive of burnout using the Copenhagen Burnout Inventory (CBI), a previously validated tool. The data were tallied, scored, and coded accordingly using Google Sheets. Prevalence risk ratio (PRR) of the variables was determined. The Chi-square test was used for statistical analysis.

Sociodemographic and online media exposure information were obtained including age, sex, their current year level, working status, type of institution they were enrolled in, hours of device usage for online classes and whether they had their own device for online schooling. Presence of online screen media exposure was accounted for if their screen time for online classes was more than four (4) hours.

The CBI was used to determine whether the study participants were experiencing burnout. This scale measured burnout level by averaging the scores of responses of the individual regarding the questions indicated in the CBI through a Likert scale. Total score on the scale was the average of the scores on the items.[8] Internal consistency of CBI was very high, estimated by Cronbach's alpha (α=0.957).[9] The scale had four aspects: personal burnout, school / work-related burnout, and classmate / colleague-related burnout, and teacher-related burnout.

To protect the adolescent age group, which was a vulnerable population, an assent form was provided to explain the study and ask the permission of possible minor-respondents. For anxiety, distress or other negative responses, participants were advised to inform / consult with their parents or guardian, and then inform the researchers or access the mental health / psychological first-aid establishments given in the informed consent form.

Lastly, as this research investigated the presence of burnout which had been associated with psychological exhaustion and mental distress, respondents who scored 50 or more in the CBI were notified of their result and were referred to a clinical psychologist for possible counseling and intervention.

Results

Out of the 161 respondents, 137 met the study criteria. However, only a total of 117 continued, including those for whom parents provided consent. Their demographic information could be seen in Table 1.

Majority were female (75, 64.10%), and the median age of the participants was 17 years old (64, 54.70%)

Table 1. Socio-demographic profile and online media exposure of participants.

Data	Count (n=117)	Frequency
Age		
16 years old	7	5.98%
17 years old	64	54.70%
18 years old	30	25.64%
19 years old	16	13.68%
Sex		
Male	42	35.90%
Female	75	64.10%
Type of School Enrolled In		
Public	12	10.26%
Private	105	89.74%
Year Level		
Grade 11	15	12.82%
Grade 12	102	87.18%
Track / Strand		
BAM	14	11.97%
HESS	72	61.54%
STEM	24	20.51%
Sports and Arts	7	5.98%
Tech-Voc	0	-
Online Screen Media Exposure Per Day		
4 hours or less	29	24.79%
more than 4 hours	88	75.21%
Device Ownership for Online Schooling		
Personal	108	92.31%
Shared	9	7.69%

with nearly all enrolled in a private institution (105, 89.74%). Most of the participants were in the year level 12 (102, 87.18%) pursuing the academic track / strand of Humanities / Education / Social Sciences or HESS (72, 61.54%), followed by Science / Technology / Engineering / Mathematics or STEM (24, 20.51%), Business / Accountancy / Management or BAM (14, 11.97%), Sports and Arts (7, 5.98%), and none from the Technical / Vocational / Livelihood track.

Of the 117 respondents, many of them had more than four (4) hours of online screen media exposure per day (88, 75.21%) and owned their own personal devices (108, 92.31%). In relation to the CBI, the majority had scored less than 50 (66, 56.41%) which comprised those without burnout (Table 2).

Cross-tabulation yielded a PRR of 3.9 (Table 3), with a p-value of 0.002.

Discussion

The findings of the study showed a relatively high proportion of participants (43.59%) with symptoms suggestive of burnout among the 117 adolescent senior high school students enrolled in different online curricula in Metro Manila. This value appeared quite close to a previous epidemiologic study which documented burnout at 46.4% among students enrolled in distance learning.[4]

Based on the PRR, students who had significant, prolonged screen media exposure were four times more likely to experience burnout. The results suggested that there was a positive association between online screen media exposure and burnout among the surveyed adolescent senior high school students enrolled in different online curricula in Metro Manila, and that this was statistically significant (α=0.05, p=0.002). Such observation could be seen as well in a previous distance learning related study wherein it was found that students who were exposed to online learning for a longer period per day were more prone to higher burnout scores 10.

Exposure to computer and smartphone screens was associated with stress-related symptoms.[11] Increased screen time influenced mental health negatively which could cause lack of productivity and anxiety, leading to burnout.[12] People could be burned out just by doing anything for too long. Digital burnout referred to the feelings of exhaustion, anxiety, depression, or loss of interest in work due to the excessive use of digital devices.[13]

Online classes required an accelerated shift on the students' coping mechanism for school-related activities. Too much reliance on smart devices also yielded to several negative effects, such as dependence and burnout-related health strains.[6] Among the

Table 2. Copenhagen burnout inventory scores.

CBI Score	Count (n=117)	Frequency (%)
less than 50	66	56.41%
50 or more	51	43.59%

Table 3. Cross-tabulation to compute for prevalence rate ratio.

(n=117)	With Burnout	Without Burnout	PRR (95% confidence interval)	p-value
With Significant Online Media Exposure	47	41	3.9	0.002
Without Significant Online Media Exposure	4	25		

youth, there were findings of increased psychological concerns due to irregular sleep cycles associated with excessive exposure to devices.[5] Sleep disturbance was an important risk factor during adolescence.

The presence of burnout could negatively affect the students' academic performance.[6] One study reported that some teachers lacked the training for proper online education and were somewhat unacquainted with technologies.[6] Educators should strategize, weigh in and consider innovative learning techniques to foster a favorable learning atmosphere for students, potentially minimizing the risk of burnout, or any other similar mental health condition among adolescents.

Limitations of the Study

There might be issues regarding the generalizability of the results of this study to the entire Filipino adolescent population since the computed sample size was not achieved. During the data collection, hesitancy from the school administrative staff and the students were encountered. This was further aggravated with the timing of the academic calendar of the chosen high schools, which made subject recruitment challenging from June 2022 to August 2022. Nonetheless, internal validity of the results remained intact.

Conclusion

Among adolescent senior high school students with significant online screen media exposure of four hours or more, there was 3.9 higher risk of exhibiting burnout symptoms, and this was statistically significant.

References

1. Tria JZ. The COVID-19 pandemic through the lens of education in the Philippines: The new normal. Int J Ped Devel Lifelong Learning 2020 [cited 2022 Oct 24];1(1). Available from: https://www.researchgate.net/publication/341981898 The COVID-19 Pandemic Through the Lens of Education in the Philippines The New Normal
2. Zhu X and Liu J. Education in and after COVID-19: Immediate responses and long-term visions. Post-digital science and education. 2020 [cited 2022 Oct 24] ;2(3):695–9. Available from: https://link.springer.com/article/10.1007/s42438-020-00126-3
3. Dewart G, Corcoran L, Thirsk L, and Petrovic K. Nursing education in a pandemic: Academic challenges in response to COVID-19. Nurse Educ Today 2020 [cited 2022 Oct 25] Sep;92:104471. doi: 10.1016/j.nedt.2020.104471. Epub 2020 May 28. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/
4. Rohmani N and Andriani R. Correlation between academic self-efficacy and burnout originating from distance learning among nursing students in Indonesia during the Coronavirus Disease 2019 pandemic. J Educ Eval Health Prof [Internet] 2021 May [cited 2021 Nov 14]; 18(9). Available from: https://www.ncbi.nlm.nih.gov/pmc/articles
5. Pandya A and Lodha P. Social Connectedness, excessive screen time during COVID-19 and mental health: A review of current evidence [Internet] Frontiers. Frontiers; 1AD [cited 2021Nov14]. Available from: https://doi.org/10.3389/fhumd.2021.684137
6. Mheidly N, Fares MY, and Fares J. Coping with stress and burnout associated with telecommunication and online learning. Front Public Health 2020 [cited 2022 Oct 25] ;8. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7686031/
7. Khairani Y and Ifdil I. Konsep burnout pada mahasiswa bimbingan dan konseling [Burnout concept in student guidance and counseling] Konselor 2015 [cited 2022 Oct 24];4:208–14. doi: 10.24036/02015446474-0-00. Available from: http://ejournal.unp.ac.id/index.php/konselor/article/view/6474
8. Borrtiz M and Kristensen T. Copenhagen Burnout Inventory: Normative data from a representative Danish population on personal burnout and results from the PUMA study. National Institute of Occupational Health [Internet] 2001 Jan [cited 2021 Nov 14]. Available from: http://www.psicopolis.com/burnout/copenhbu.pdf
9. Campos J, Carlotto M, and Maroco J. Copenhagen Burnout Inventory - Student Version: Adaptation and transcultural validation for Portugal and Brazil. Psicologia: Reflexao e Critica [Internet] 2012 Dec [cited 2021 Nov 14]; 26. Available from: https://www.researchgate.net/publication/262473002_Copenhagen Burnout Inventory_Student Version Adaptation and Transcultural Validation for Portugal and Brazil
10. Durmus, Serpil Çelik, et al. Determining digital burnout in nursing students: A descriptive research study. Nurse Education Today 2022; 111. [cited 2022 Oct 25], p. 105300. Available from: https://doi.org/10.1016/j.nedt.2022.105300.
11. Lemola S, Perkinson-Gloor N, Brand S, Dewald-Kaufmann JF, and Grob A. Adolescents' electronic media use at night, sleep disturbance, and depressive symptoms in the smartphone age. J Youth Adolesc 2015 [cited 2022 Oct 24] 44: 405–18. 10.1007/s10964-014-0176-x. Available from: https://pubmed.ncbi.nlm.nih.gov/25204836/
12. Chen Q, Dai W, Li G, and Ma N. The impact of screen time changes on anxiety during the COVID-19 pandemic: Sleep and physical activity as mediators - Sleep and biological rhythms [Internet]. SpringerLink. Springer Nature Singapore; 2022 [cited 2022 Oct 24]. Available from: https://link.springer.com/article/10.1007/s41105-022-00398-1
13. Power Down: 5 Ways To Fight Digital Burnout [Internet]. Digital Burnout and Mental Health | McLean Hospital. 2022 [cited 2022 Oct 25]. Available from: https://www.mcleanhospital.org/essential/digital-burnout

An analytical cross-sectional study on the association between weight changes and stress levels among first to fourth year medical students of a private medical school from A.Y. 2023-2024

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Abstract

Introduction The demanding nature of medical school causes students to experience stress, anxiety, and depressive episodes that may cause students to gain or lose weight. This study aimed to determine the association of weight changes and stress levels among a private medical school students.

Methods Data were collected two times with an interval of 30 days through on-site measurement of the students' anthropometrics using a stadiometer and utilization of online survey questionnaires accessed via QR code. Demographics and disease states were identified in the first round of data collection while the Perceived Stress Scale-10 (PSS-10) and identification of stressors was integrated in the second round of data collection.

Results Among the 212 individuals, 69.8% were categorized into having perceived moderate stress levels, 22.2% with high stress, and 8% with low stress. Of the 212 cases, 86 gained weight, 91 lost weight, and 35 had no change in weight. Fear of failure, poor motivation, and difficulty understanding lectures are among the top overall stressors. The study noted that there is a moderate association between stress and weight changes but it is not enough to reach statistical significance (0.161), as the sample size was not reached. The study revealed that the prevailing diseases were Polycystic Ovarian Syndrome, Hypothyroidism, and Hypertension, which have varying degrees of impact on weight change.

Conclusion There is an association between weight changes and stress levels among first to fourth year medical students of a private medical school from A.Y. 2023-2024.

Key words: Weight gain, weight loss, stress levels, medical students

When pressure surpasses one's apparent capacity to cope, the end-result is stress. Stress is the body's response to a change that necessitates an adjustment or response on mental, physical, or emotional level. The depth and complexity of the topics that must be learned, as well as the on-going demands on students' time, have been cited as reasons why studying medicine is perceived to be stressful. Given the demanding nature of the curriculum in medical school, medical students have been found to have higher levels of stress, anxiety, and depressive episodes. The prevalence of stress among medical students is estimated to be around 28.5%–78%, with an overall prevalence rate of 31.7%, with varying degrees per year level as each level's demands vary.[1]

It has been demonstrated that stress causes medical students to have more negative consequences in both

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personal and professional levels. In fact, numerous studies have discovered a significant correlation between high levels of stress and anxiety, and a decline in class performance, student interactions, clinical practice, and overall poor academic performance.[2] In general, a person's eating habits may change as a result of extreme stress, which may then change how they react to stress by affecting their weight. Depending on a person's body mass index or level of stress, the results may vary. Under stressful conditions, some students may gain weight as a result of these factors, while others may lose weight due to the same factors.[3]

The present study was carried out to determine the association of stress levels and weight changes among private medical school students, specifically, (a) categorized the stress levels of first to fourth year Medical Students enrolled in a private medical school for the academic year 2023-2024 according to the Perceived Stress Scale, (b) compared the baseline weight from their current weight, which is measured 30 days after (c) determined which academic year level in medical school experienced the most stress and (d) determined the top stressors that medical students experienced.

Methods

Study Design

The researchers utilized an analytical-cross sectional study design. This study ran for a duration of 10 months with data collection spanning 3 months. This study was approved by the UERMMMCI RIHS Ethics Review Committee with RIHS ERC Code: 1458/C/2023/030.

First to fourth year medical students of a private medical school enrolled for A.Y. 2023-202 were selected through convenience sampling. However, irregular students, as well as students who worked part-time or full-time and, thus, were experiencing varying levels of stress, were excluded from the study. Their heights and weights were measured and they were given survey questionnaires composed of their socio-demographic profile, anthropometrics, questions from the Perceived Stress Scale, and identification of their stressors. The data collected were then analyzed and the procedures were followed.

The sample size needed for the study was calculated using the formula for stratified random samplingwith the maximum tolerable error set at 5%.[1]. The calculated minimum number of needed participants was 233 individuals with the additional 20% number of participants as a buffer. The total calculated sample size was 283 participants.

Anthropometrics of the students were obtained using a stadiometer and online survey questionnaires was used. The researchers conducted on-site measurements of the anthropometric data, specifically of the weight and height to ensure that they were accurate and based on a uniform scale using Indoplas Dial Type Weighing Scale.

The study involved a second round of data collection (30 days after first collection) to assess the link between stress levels and weight change. Subsequently, the Perceived Stress Scale-10 (PSS-10), a 10-item questionnaire was used to gauge the stress levels of the participants by rating each item (0) Never, (1) Almost Never, (2) Sometimes, (3) Fairly Often, or (4) Very Often. The internal consistency of the PSS-10, has been found to be mostly good, with Cronbach's alpha values ranging from 0.82 to 0.89 as calculated in a study.[4] Following the PSS-10 assessment, participants were asked to mark their stressors such as academic factors, psychosocial factors, and teaching-related factors, allowing them to select as many stressors as they felt applied to them.[1]

Descriptive and inferential statistics were done, while Chi-square, Likelihood ratio, Linear-by-linear association and Prevalence Odds Ratio were utilized to test for the association and likelihood between stress levels and weight changes.

Confounding variables were identified that may affect the study, specifically, the existing disease states of the participants as certain diseases may cause one to unintentionally gain or lose weight. The existence of such conditions may have an impact on the study's findings since the researchers would be unsure whether the weight change was caused by stress or by the underlying ailment. Although such individuals could have been removed from the study, the researchers chose to include them because there are many diseases that could impact one's weight. Other issues that could not be accounted for were the undiagnosed ones.

Results

The primary aim was to explore the relationships between stress levels and various variables, such as

emotional reactions, academic demands, and health issues, specifically among medical students.

There were 212 participants, where 152 were females (71.7%) and 60 males (28.3%).

The prevalence of academic stressors, which was identified by 210 participants, is exhibited in Figure 1. Fear of failure (83.8%), heavy workload (78.1%) and tight schedule (72.9%) were identified as the top 3 academic stressors.

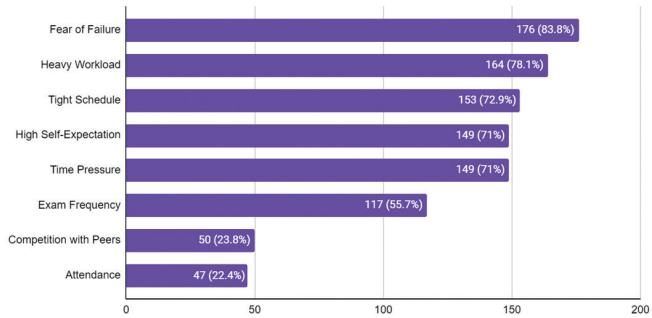

Figure 1. Prevalence of academic stressors.

The prevalence of psychosocial stressors found among 196 respondents, as found in Figure 2, shows poor motivation (68.9%) as the top source of psychosocial stress followed by loneliness (52%). Lack of family support (7.7%) was the least identified psychosocial stressor.

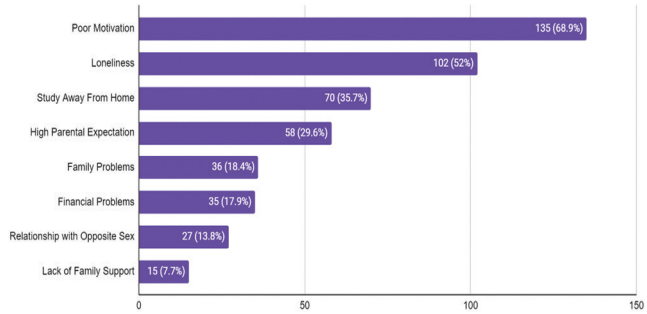

Figure 2. Prevalence of psychosocial stressors.

Teaching-related stressors were identified by the 169 participants as presented in Figure 3. Among these, difficulty understanding lectures (85.8%) was the highest. This is followed by poor teaching skills (32.5%) and poor teacher support (30.8%).

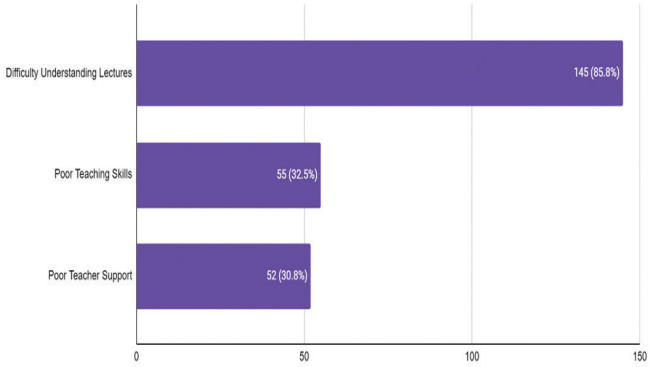

Figure 3. Prevalence of teaching-related stressors.

An in-depth exploration of the relationship between perceived stress levels and various emotional states among the 212 medical students is seen in Table 1. The study scrutinized ten different aspects of stress, ranging from feelings of being upset to challenges in coping with overwhelming situations.

A consistent pattern of reported stress levels was observed across all year levels, with the majority (69.8%) experiencing moderate stress, followed by high stress (22.2%) and low stress (8%) as presented in Table 2.

The perceived stress scores of each year level are presented in Table 3. It shows that first year medical students have the highest stress levels, while second, third and fourth-year medical students have slightly lower stress levels.

Table 4 categorizes BMI distribution across the year levels. Only 37.26% had a normal BMI, with the remaining 25.47% categorized as obese I, 16.04% as overweight, 11.32% as obese II, and 9.91% as underweight.

The relationship between perceived stress levels and weight changes among the student population is seen in Table 5. Majority of the students have moderate stress levels while the minority have either high or low levels of stress.

Table 6 shows that with a POR of 0.99 or close to 1, there was almost no difference in the weight gain between medical students with high stress levels compared to those with moderate stress levels.

Table 7 indicates that medical students who gained weight are two times less likely to be the ones who were experiencing moderate stress levels compared to those with low stress levels.

Table 1. Description of the sample characteristics stratified by the Perceived Stress Scale-10 (PSS-10)

Perceived Stress	Never		Almost Never		Sometimes		Fairly Often		Very Often		Chi-Square [a]	
	N	%	N	%	N	%	N	%	N	%	X^2	p-value
1. In the last month, how often have you been upset because of something that happened unexpectedly?	1	0.5	16	7.5	73	34.4	80	37.7	42	19.8	**0**	1
2. In the last month, how often have you felt that you were unable to control the important things in your life?	8	3.8	29	13.7	64	30.2	77	36.3	34	16	**0**	1
3. In the last month, how often have you felt nervous and stressed?	0	0	9	4.2	27	12.7	89	42	87	41	**0**	1
4. In the last month, how often have you felt confident about your ability to handle your personal problems?	21	9.9	0	0	76	35.8	93	43.9	22	10.4	**0**	1
5. In the last month, how often have you felt that things were going your way?	17	8	68	32.1	94	44.3	31	14.6	2	0.9	**0**	1
6. In the last month, how often have you found that you could not cope with all the things that you had to do?	8	3.8	47	22.2	69	32.5	72	34	16	7.5	**0**	1
7. In the last month, how often have you been able to control irritations in your life?	21	9.9	77	36.3	80	37.7	30	14.2	4	1.9	**0**	1
8. In the last month, how often have you felt that you were on top of things?	7	3.3	46	21.7	108	50.9	44	20.8	7	3.3	**0**	1
9. In the last month, how often have you been angered because of things that happened that were outside of your control?	16	7.5	49	23.1	63	29.7	65	30.7	19	9	**0**	1
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	9	4.2	33	15.6	57	26.9	87	41	26	12.3	**0**	1

[a] *The Pearson Chi-square revealed that there is no statistically significant difference in these emotional responses across different levels of perceived stress.*

Table 2. Distribution of students according to year level and their corresponding perceived stress level.

Parameters	Year Level								Total	
Stress Level	First Year		Second Year		Third Year		Fourth Year			
	N	%	N	%	N	%	N	%	**N**	**%**
High (27-40)	18	25	6	16.7	13	22.4	10	21.7	**47**	**22.2**
Moderate (14-26)	50	69.4	30	83.3	37	63.8	31	67.4	**148**	**69.8**
Low (0-13)	4	5.6	0	0	8	13.8	5	10.9	**17**	**8**
Total	**72**	**100**	**36**	**100**	**58**	**100**	**46**	**100**	**212**	**100**

Table 3. Perceived stress scores of each year level.

Year Level	Median Perceived Stress Score
First Year	23
Second Year	22
Third Year	22.5
Fourth Year	22

Table 4. Distribution of students according to year level and their BMI.

Parameters	Year Level								Total	
BMI	First Year		Second Year		Third Year		Fourth Year			
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Obese II	7	9.72	5	13.89	6	10.34	6	13.04	**24**	**11.32**
Obese I	20	27.78	9	25	16	27.59	9	19.57	**54**	**25.47**
Overweight	9	12.5	5	13.89	11	18.97	9	19.57	**34**	**16.04**
Normal	24	33.33	14	38.89	21	36.21	20	43.48	**79**	**37.26**
Underweight	12	16.67	3	8.33	4	6.9	2	4.35	**21**	**9.91**
Total	**72**	**100**	**36**	**100**	**58**	**100**	**46**	**100**	**212**	**100**

Table 5. Cross tabulation analysis between the stress levels and weight changes.

Stress Level		(+), (-), (0) Weight Changes			Total
		(+) Weight Gain	(-) Weight Loss	(0) No Change	
PSS VALUES	High	17	19	11	47
	Moderate	61	68	19	148
	Low	8	4	5	17
Total		86	91	35	212

Table 6. Prevalence odds ratio for high and moderate stress levels and weight changes.

	(+) Weight Gain	(-) Weight Loss	Total
(3) High Stress Level	17	19	36
(2) Moderate Stress Level	61	68	129
Total	78	87	165
Prevalence Odds Ratio	**0.997411562**		

Table 7. Prevalence odds ratio for moderate and low stress levels and weight changes.

	(+) Weight Gain	(-) Weight Loss	Total
(2) Moderate Stress Level	61	68	129
(1) Low Stress Level	8	4	12
Total	69	72	141
Prevalence Odds Ratio	**0.448529412**		
1/POR	**2.229508196**		

Table 8 indicates that medical students who gained weight are two times less likely the ones who were experiencing high stress levels compared to those with low stress levels.

As displayed in Table 9, there is a moderate relationship between stress levels and weight changes among medical students, but the association is not statistically significant.

The identified disease states among participants are detailed in Table 10. Out of the 212 participants, 49 reported being diagnosed with various disease states. The 12 identified disease states were as follows: Polycystic Ovarian Syndrome (PCOS) was the most common, reported by 35 participants, followed by hypothyroidism with 8 participants, and 3 participants each with bronchial asthma and hypertension. Irritable Bowel Syndrome (IBS) was reported by 2 participants, and the remaining diseases had single participants each.

Table 8. Prevalence odds ratio for high and low stress levels and weight changes.

	(+) Weight Gain	(-) Weight Loss	Total
(3) High Stress Level	17	19	36
(1) Low Stress Level	8	4	12
Total	25	23	48
Prevalence Odds Ratio	**0.447368421**		
1/POR	**2.235294118**		

Table 9. Cross tabulation test of association between the stress levels and weight changes among the participants.

Test of Association	Value	df	Asymptotic Significance (2-sided)	Level of Association	Decision	Conclusion
Pearson Chi-Square	6.565[a]	4	0.161	Moderate	Not Significant	There is no Significant Association
Likelihood Ratio	**6.472**	**4**	**0.167**	**Moderate**	**Not Significant**	
Linear-by-Linear Association	0.578	1	0.447	Weak	Not Significant	
N of Valid Cases	212					

a. 1 cell (11.1%) has expected count less than 5. The minimum expected count is 2.81, which means that the assumption has been violated. Therefore, the likelihood ratio will be respected and used to tell the level of significant relationship between the weight changes and perceived stress level at 0.05 level of significance.

Table 10. Disease states of participants and weight changes.

	Weight Loss		No Change		Weight Gain		Total
Disease State	**N**	**%**	**N**	**%**	**N**	**%**	
Hypothyroidism	2	25	2	25	4	50	8
Bronchial Asthma	0	0	0	0	3	100	3
Atopic Dermatitis	0	0	0	0	1	100	1
Polycystic Ovarian Syndrome (PCOS)	17	48.57	6	17.14	12	34.3	35
G6PD deficiency	0	0	0	0	1	100	1
Irritable Bowel Syndrome (IBS)	1	50	0	0	1	50	2
Type 2 Diabetes Mellitus	0	0	1	100	0	0	1
Depression	0	0	0	0	1	100	1
Psoriasis	1	100	0	0	0	0	1
Anemia	0	0	0	0	1	100	1
Hyperacidity	0	0	0	0	1	100	1
Hypertension	2	66.67	0	0	1	33.3	3

Discussion

Medical Students and Stress

Medical students encounter an increased amount of stress during their studies due to various factors. A survey was conducted to assess sources of stress among medical students and categorized these into three: academic factors, psychosocial factors, and teaching-related factors.[1] They were broken down into specific stressors. The participants in this study were likewise asked to identify the stressors that affect them.

As shown in the study, the top three academic stressors identified were fear of failure, heavy workload, and a tight schedule. A study in Germany similar to these results has reported as stressor such as fear of failure among medical students because this may result in expulsion from the medical school as well as not having time to studying.[5]

Among the psychosocial stressors, the following were the most prevalent among medical students: poor motivation, loneliness, and studying away from home. As shown in a study, family ties were perceived as an important support system against permanent stress, hence loneliness and studying away from home entailed participants to encounter personal challenges from transitioning to living with family to living alone.[5]

Among the top teaching-related stressors, majority of the medical students rated difficulty comprehending lectures as their top stressor. This could be ascribed to heightened difficulty in the subject matter and the increased number of topics that need to be mastered within a given time.

Perceived Stress

The data revealed that across all year levels, students experienced varying degrees of stress. The first-year students were found to have the highest level of stress. The sudden shift in complexity of topics from their undergraduate studies may have caused a high increase in stress. Similar findings can be seen in a study conducted among medical students in Ethiopia.[6] A decline in high stress level is seen as the year progresses (exception for the second year students) which is reflected in similar studies with medical students.[2,7] Although the obtained stress levels in the other year levels were only slightly lower.

Relationship between Stress and Weight

Only 37% of the participants fell under the category of a normal BMI. Majority have abnormal BMI: Overweight, Obese I, and Obese II, and underweight with a percentage of 16.04%, 25.47%, 11.32%, and 9.91%, respectively.

Table 5 presents a comprehensive analysis of the relationship between stress levels and weight changes among students. The data are organized into three stress levels (High, Moderate, and Low) and three weight change categories (Weight Gain, Weight Loss, and No Change). The values provided highlight the different responses of students to stress levels, with varying weight changes.[3]

It was shown that medical students who gained weight were two times less likely to have high stress level. Those who gained weight were likely those who were moderately stressed. This implied that people who experience high levels of stress are not likely to have major changes in comparison to others who experience moderate levels of stress.

This suggests that stress does not completely shield individuals from weight changes but may have a protective effect against weight loss.

Medical students with moderate stress levels are two times less likely to experience weight gain compared to those with low stress levels. This finding implies that moderate stress levels may provide some level of protection against weight gain as compared to low stress levels. A moderate level of stress in comparison to a low level of stress, may account for why those with low levels of stress are more likely to gain weight. This is explored in past research where higher levels of stress may cause one to develop unconscious habits such as foot tapping or finger clicking that result in unanticipated weight loss bccause these tics can actually burn calories.[10] In times of stress, the body enters the "fight or flight" mode, also referred to as the "acute stress response." It is also possible that because of the stress, the body releases adrenaline which can also reduce the appetite. The lower likelihood of weight gain among students with high stress may be influenced by various factors such as stress-induced changes in eating habits, metabolism, or other lifestyle factors.

Higher levels of stress can also cause one to gain weight as a result of the stress hormone cortisol which is known to decrease metabolism and has a direct relationship with stress-induced eating and binge eating.[8] However it is also important to note that while stress at a moderate level appears to be linked to weight gain, various other factors could contribute to this relationship.

In simpler terms, this means that students with moderate stress levels are significantly more likely to lose weight when compared to their counterparts with low stress. This finding indicates a strong association between moderate stress and weight loss among students. Higher stress levels were found to be significantly associated with meal skipping, which may

contribute to weight loss.[9] However it is essential to recognize that while stress at a moderate level appears to be linked to weight loss, various other factors may influence this relationship.

In this study, there was no significant difference in the likelihood of weight gain and no change in weight between those with high and low stress levels. These stress categories did not significantly influence weight gain or maintenance. This finding implies that other factors beyond stress levels may be at play in determining weight changes among students. While stress management remains crucial for overall well-being, this particular study indicates that stress levels alone may not be a decisive factor in predicting weight changes among students.

Impact of Stress and Weight on Health

The present study determined the association between stress levels and weight changes among first to fourth year medical students of a private medical school enrolled for the A.Y 2023-2024. The data revealed interesting patterns in weight fluctuations within different medical states. For example, those with Hypothyroidism showed varying results, with 50% reported weight gain, while others either lost weight or maintained their weight. On the contrary, individuals diagnosed with Bronchial Asthma and Atopic Dermatitis consistently gained weight in all recorded cases. In one study, they found a correlation between an increase in asthma severity and changes in gastrointestinal function brought on by weight gain.[10]

Among individuals with various diseases, such as Polycystic Ovarian Syndrome (PCOS), a noteworthy number reported experiencing weight loss, indicating a potential correlation between PCOS and weight reduction. Similarly, individuals with Hypertension demonstrated weight loss, suggesting a potential association between managing hypertension and losing weight. In the early stages of life, there is an observable relationship between blood pressure and weight, with the correlation coefficient rising to approximately 0.4 in young people and subsequently declining in older age groups.[11] Other disease states were identified, including Type 2 diabetes mellitus, where one medical student maintained his weight, and psoriasis, which resulted in weight loss. These outcomes may be attributed to efforts aimed at improving overall health and alleviating disease symptoms.[12,13] Additionally, diseases like depression, anemia, and hyperacidity have been associated with weight gain due to various physiological factors, as indicated in previous studies.[14,15]

Conclusion

In conclusion, it is worth noting that there is an association between stress levels and weight changes among first to fourth year medical students of a private medical school. The year level that is categorized as having the highest stress level are the first year, but the difference between year levels was not too marked. The majority of the medical students experienced having moderate stress and have shown to gain and lose weight almost equally. Fear of failure, heavy workload, and tight schedules were the top academic stressors identified by the majority of medical students across all academic levels. Poor motivation and loneliness were the most prevalent psychosocial stressors, while difficulty understanding lectures was the leading teaching-related stressor.

Limitations and Recommendations

In this study, the following were considered to be some of the limiting factors: (1) weight changes were only measured within a month, which may present with minimal differences as the PSS-10 scale utilized is only valid in measuring perceived stress over the preceding month; (2) medical students' environment has drastically changed since the first measurement compared to the second, which may greatly affect their stress levels; (3) due to conflict of schedule, some students were not exactly measured after the same number of days (e.g. 30 days), as well as some being difficult to contact after the first data collection; (4) the use of analog stadiometers limited the measurement of weight to increments of 500 grams, thus preventing a more accurate measurement of changes in weight. Though the researchers attempted to minimize its effects, non-response bias was identified in the study, thus sample size was not reached and presented as a limitation of this study.

Moreover, for future similar studies, it is recommended to have a longer period of data collection as 30 days may not be enough to accurately depict weight change. A questionnaire that is more apt for measuring long-term stress may be used in this circumstance. It is also recommended that there be a minimum value for the change in weight for it to

be considered as actual weight change as weight can fluctuate daily due to a variety of reasons (e.g. food and beverage intake, bowel movements, hydration levels, weather). In relation to this, it would be better to follow a stricter data collection schedule so that such confounding variables may be accounted for. Having a specified data collection schedule would likewise make all data comparable and standardized. Future studies may also adopt a more systematic and strategic planning on data collection by arranging medical students per year level and section for a more efficient data collection.

Another recommendation is to employ a higher-quality and more portable stadiometer, preferably one that doesn't require frequent re-calibrations, to minimize errors in data collection. Due to scheduling differences between participants and researchers, the data collection location varied for the sake of participant convenience, emphasizing the importance of instrument portability. Additionally, it is advisable to include more specific individuals within the target population, such as students residing in dormitories near the school or those commuting between their homes and the school, as they may experience different stressors. Using a more detailed questionnaire to explore participants' coping mechanisms is recommended to understand the observed changes in weight. For future studies, a more comprehensive examination of disease states affecting stress and weight, integration of lifestyle factors, social interactions, stress management techniques, and manifestations of stress can contribute to a deeper understanding of the interactions among these factors and stress.

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References

1. Ragab EA, Dafallah MA, Salih MH, Osman WN, Osman M, Miskeen E, et al. Stress and its correlates among medical students in six medical colleges: An attempt to understand the current situation. Middle East Curr Psychiatr 2021;28(1). doi: 10.1186/s43045-021-00158-w
2. Abdulghani HM, AlKanhal AA, Mahmoud ES, Ponnamperuma GG, Alfaris EA. Stress and its effects on medical students: A cross-sectional study at a College of Medicine in Saudi Arabia. J Health Pop Nutr [Internet] 2011 Nov 13 [cited 2022 Oct 14];29(5). doi: 10.3329/jhpn.v29i5.8906
3. Goswami B. Prevalence of stress and its association with body weight among the medical students of Jorhat Medical College and Hospital, Jorhat. Int J Stud 2017;4(11):1-3. doi: 10.17354/ijss/2017/36
4. Lee, EH. Review of the psychometric evidence of the perceived stress scale. Asian Nurs Res 2012 Dec;6(4):121-7. doi:10.1016/j.anr.2012.08.004
5. Bergmann C, Muth T, Loerbroks A. Medical students' perceptions of stress due to academic studies and its interrelationships with other domains of life: a qualitative study. Med Educ Online 2019 Dec;24(1):1603526. doi: 10.1080/10872981.2019.1603526.
6. Melaku L, Mossie A & Negash A. (2015a, December 2). Stress among medical students and its association with substance use and academic performance. Journal of Biomedical Education. https://www.hindawi.com/journals/jbe/2015/149509/#discussion
7. Guthire E, Black D, Bagalkote H, Shaw C, Campbell M, Creed F. Psychological stress burnout in medical students: a five-year prospective longitudinal study. J R Soc Med 1998;91:237–43.
8. Chao AM, Jastreboff AM, White MA, Grilo CM, Sinha R. Stress, cortisol, and other appetite-related hormones: Prospective prediction of 6-month changes in food cravings and weight. Obesity 2017Mar28;25(4):713–20. doi: 10.1002/oby.21790
9. Geiker NR, Astrup A, Hjorth MF, Sjödin A, Pijls L, Markus CR. Does stress influence sleep patterns, food intake, weight gain, abdominal obesity and weight loss interventions and vice versa? Obes Rev 2017 Aug 28;19(1):81–97. doi: 10.1111/obr.12603
10. Parenti C, Murphy AM, Lad N, McTernan PG, Nelson CP, Sharpe GR, et al. Investigating the effect of obesity on gut damage, systemic inflammation, enhanced asthma severity due to gut derived bacteria, endotoxin. In: Endocrine Abstracts [Internet]. Bioscientifica; 2022 [cited 2023 Oct 31]. Available from: https://www.endocrine-abstracts.org/ea/0086/ea0086p211
11. Havlik, Richard MD, et al. Weight and hypertension. Ann Int Med 2008; 98(5): 855-9. https://doi.org/10.7326/0003-4819-98-5-855. Accessed 1 Nov. 2023
12. Feldman AL, Griffin SJ, Ahern AL, et al. Impact of weight maintenance and loss on diabetes risk and burden: a population-based study in 33,184 participants. BMC Public Health 2017; 17: 170. https://doi.org/10.1186/s12889-017-4081-6
13. Alotaibi HA. Effects of weight loss on psoriasis: A review of clinical trials. Cureus 2018 Oct 24;10(10):e3491. doi: 10.7759/cureus.3491.
14. Sutin AR, Zonderman AB. Depressive symptoms are associated with weight gain among women. Psychol Med 2012 Nov;42(11):2351-60. doi: 10.1017/S0033291712000566. Epub 2012 Apr 5.
15. Yoshikawa I, Nagato M, Yamasaki M, Kume K, Otsuki M. Long-term treatment with proton pump inhibitor is associated with undesired weight gain. World J Gastroenterol 2009 Oct 14;15(38):4794-8. doi: 10.3748/wjg.15.4794.

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Krugman S, Overby LR, Mushahwar IK, et al. Viral hepatitis type B: studies on the natural history and prevention reexamined. N Engl J Med 1979; 300: 101-6.

Nyland LJ, Grimmer KA. Is undergraduate physiotherapy study a risk factor for low back pain? A prevalence study of LBP in physiotherapy students. Retrieved from: http://www.Biomed-central.com/1471-2474/4/22. 2003. [Accessed August 27, 2011].

Rankin J, Tennant PW, Stothard KJ, et al. Maternal body mass index and congenital anomaly risk: A cohort study. Int J Obes 2010; 34(9): 1371-80. Available from: http://ncbi.nlm.nih.gov/pubmed/20368710. [Accessed August 27, 2011].

Books and other monographs

Personal authors

Adams RD, Victor M. Principles of Neurology. New York: McGraw-Hill; 1981.

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