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Medical students' experiences of online learning during the COVID-19 pandemic: A phenomenological study

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Abstract

Introduction The COVID-19 pandemic forced Philippine medical schools to adapt their curriculum design to fit an online setup. This study aimed to analyze and interpret the lived experiences of medical students who experienced online learning during the COVID-19 pandemic and to explore the adaptations to online learning.

Methods This is an interpretive phenomenological study using purposive sampling. Participants were 1st to 3rd year medical students enrolled for Academic Year 2020-2021. Participants were interviewed online by a psychologist who was not part of the research team using a 13-question guide. The interviews were recorded and transcribed. Interview data were analyzed and interpreted using interpretative phenomenological analysis (IPA).

Results Nine medical students were interviewed. The IPA identified six superordinate themes: 1) positive adaptations through positive reframing; 2) resulting mental health concerns; 3) intrinsic and extrinsic concerns encountered; 4) self-awareness as a first step towards adjustment; 5) dual role of family; and 6) perceptions on systemic response.

Conclusion Online medical education during the pandemic resulted in problems and mental health concerns among participants, and many developed self-awareness and positive adaptations specific to the online setup. Participants' families helped some adjust, while others posed an additional challenge. Both positive and negative perceptions of the systemic response of the school also arose.

Key words: COVID-19, online medical education, phenomenology, coping strategies, mental health, experience of online learning

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COVID-19 was declared as a global pandemic by the World Health Organization (WHO) on March 11, 2020. By March 17, 2020, the Philippines was placed under community quarantine to manage the spread of the disease, along with various preventive measures such as lockdowns and media campaigns.[1] Classes were interrupted late into the second semester of Academic Year (AY) 2019-2020 and medical schools only had several weeks to shift from a classroom setting to an online setup in order for students to finish the semester.[2] With the current quarantine measures to contain the spread of the virus, online

classes are expected to be the new normal in medical education until community quarantines are lifted and resumption of face-to-face classes is deemed safe for students and faculty alike. As a result, medical schools in the Philippines had to adapt their curriculum to an online platform to continue the education of medical students. With the shift to online learning, higher education institutions were given the freedom to implement innovative designs and alternative modes of learning.[3]

In the Philippines, previous studies using quantitative designs have focused specifically on the barriers and challenges faced by medical students in online learning, rather than on eliciting the lived experiences in a phenomenological study.[1,4] The study aimed to analyze and interpret the lived experiences of medical students in a private university who were on an online learning set-up during the COVID-19 pandemic, and explore their adaptations.

Methods

The interpretive phenomenological analysis (IPA), which specifically followed the ideals of Martin Heidegger's hermeneutical phenomenology was used to elicit, interpret, and analyze the participants' lived experiences.[5] This study was approved by the UERM Research Institute for Health Sciences Ethics Review Committee.

Purposive sampling was used to identify qualified participants. Included were first year to third year regular medical students, aged 18 years old and above, enrolled in a private medical school with online classes as the primary method of education delivery for AY 2020-2021. The researchers identified medical students who were qualified based on the inclusion criteria and an invitation to participate in the study was sent via Facebook Messenger. Individuals who gave their informed consent were given the Personal Information Sheet (PIS) via Google Forms. This obtained the participants' demographic information including their gender, age, residence, educational status, email, and contact number. After signing up, the researchers contacted them again via Facebook Messenger for the schedule of the interview.

Individual interviews were conducted via Google Meet. To ensure objectivity, an independently trained moderator who was not part of the research team was tasked to do the interviews, in view of the researchers being medical students in the same institution as the participants. The moderator was a licensed psychologist and psychology professor who taught qualitative research in graduate school to guidance and counseling majors and psychology majors. The research team created an interview guide consisting of 13 open-ended questions which allowed the participants to freely narrate their experiences. This was revised, validated, and was pilot tested with four students. The interviews started with an introduction of the study and the moderator, followed by questions to the participants about their lived experiences of online learning. The interview lasted for 45 to 60 minutes with audio and video recordings. Transcriptions were typed using Microsoft Word during the interview by transcribers and each participant was identified by a code containing P and their order in the interview (e.g., P1). This was to ensure the anonymity and confidentiality of the statements. Each transcription was emailed to the respective participant for them to give comments and corrections. No repeat interviews were done.

IPA was used for the analysis and interpretation of the interviews. At the beginning of the study, the researchers used the method of bracketing by creating a list and description of their own experiences with online learning to prevent interjecting their own lived experiences to those of the participants. After each interview, each researcher made an initial analysis and interpretation of each response and statement of the participants resulting in the formation of initial themes. The interpretations of all researchers were then compared to reconcile any differences if any emerged. The result of the analysis of each participant's interview was emailed to the participants to check the congruence of the researchers' working interpretations with the participants' own interpretations of their statements. After the analysis and interpretation of the statements of each participant, the researchers assessed whether additional interviews were needed to refine existing themes. All interpretations were then organized into subordinate and superordinate themes.

Results

Nine medical students were interviewed. Two of the participants provided minor corrections regarding the interpretations of the researchers. After the analysis of the ninth interview, the researchers were unable to develop new themes or refinements to existing themes, pointing to data saturation. After

the IPA, the investigators were able to develop six superordinate themes that provided an interpretation of the lived experiences of online learning of medical students during the COVID-19 pandemic: 1) positive adaptations through positive reframing; 2) resulting mental health concerns; 3) intrinsic and extrinsic concerns encountered; 4) self-awareness as a first step towards adjustment; 5) dual role of the family; and 6) perceptions on systemic response.

Superordinate Theme 1: Resulting Mental Health Concerns

As lockdown restrictions continued while online classes were being conducted, several mental health concerns arose, including a sense of decreased well-being and feelings of isolation. With an overwhelming workload and no means to destress, participants stated neglect of their physical and mental health, some ending up with anxiety symptoms that prompted consultation.

Subordinate theme 1: Sense of decreased well being

Due to the overwhelming amount of workload with no means to destress themselves, participants expressed feeling a sense of burnout. Most of the time and focus of the participants were channeled towards their lessons and academic work which sometimes resulted in neglecting their physical and mental health. This resulted in increased anxiety symptoms which led some participants to seek professional help. These were expressed in the following statements:

"Now it's easy to get bloated and to gain fat when you are stress eating."

"I am more concerned about my physical health because my headaches won't go away. Okay, I need to do something about it and have myself checked."

Subordinate theme 2: Feelings of isolation

Isolation was a recurring theme among several participants which was discussed heavily during the interviews. Isolation was felt due to less interaction with friends and classmates caused by the restrictions brought about by online classes.

"After class you have no one to talk to. It's difficult to know what's next because in face to face you're with your classmates. It's like you have the same pacing together. During online, it was also harder to make friends at first."

"Another is, I think is... not seeing my group mates and my friends. Personally, I like studying with other people so now it feels all alone."

Being confined within their homes and the lack of social connection due to difficulties in finding people to relate with regarding the experiences in medical school also deepened the feelings of isolation.

"I had a hard time because I cannot relate to their field, so during dinner they talk about different things because they are in the same field while I have a different one. It was difficult to share the struggle because they did not understand."

"It can be isolating po because they [family] are asleep and you're in your room studying."

Superordinate Theme 2: Intrinsic and Extrinsic Concerns Encountered

Intrinsic and extrinsic concerns were encountered by the participants during online classes. Intrinsic concerns were difficulties relating to personal factors such as time management, regrets over decisions, and concerns about the future. Extrinsic concerns were situations encountered by the participants that caused them difficulties such as adjustments to a new learning setup and limitations of online classes.

Subordinate theme 1: Intrinsic concerns

Time management was considered a problem since the online setup made it difficult to balance work, life, and school. Participants felt like their time was more constricted, hindering them from doing other activities.

"It's been hard obviously, it takes a lot of time and consideration especially for example when we had the comprehensive exams, I had to take a break on literally everything else from my life."

"You're really putting more time [studying], so it feels like sometimes, I am losing time for them [family]."

Other expressed their doubts and regrets regarding their school of choice and their decisions in continuing with online learning as expressed in the following statements:

"I entered [school] because they said it's a student friendly, it's a pro student school. So I had other options but I chose [name of school redacted] mainly because of that and because the school had

a good reputation but then the pandemic started I … I started to doubt it is how it really is."

"I do [have regrets]. Sometimes the thought crosses my mind. 'I should've gone to a different school, I should have waited, I should have just went to States, I should have chosen a different occupation.'"

Participants noted feeling guilty about relaxing, feeling the need to study more, and feeling like their effort did not match the grade that they got. Participants expressed how they did not feel confident about the skills that they learned and expressed how they felt ill-equipped to practice clinical skills. These were expressed in the following:

"I think if there was something really lacking for me it was really the skills", referring to her skills as a clinical clerk.

"I felt guilty about relaxing before, so I just keep studying but the more I study, the less I learn. Ironic."

"I try to stay up later but when, you know, the results… it doesn't match up with the efforts that you put in, those days tend to get harder."

Subordinate theme 2: Extrinsic concerns

The new learning environment at home was one of the adjustments participants had to make. Participants expressed the burden brought by school policy changes in the online academic setup. They particularly mentioned changes in the grading system. "At first, I wasn't comfortable studying at home. Because before, for me, because home is a rest from weekdays. But now it's already my work so now it's no longer a safe zone from all the stressors, and school."

The participants expressed the limitations and the insufficiency of online learning especially in terms of laboratory works and practicing clinical skills. First year students were not able to experience gross laboratory dissection in anatomy. History taking interviews with actual patients was also limited in online learning.

"I feel that I am lacking experiences when I was in first year because I imagined me and my classmate dissecting or live dissection of cadavers. It's just so fun to experience it I was just in first year, but work around is to have dissection picture instead."

"We had classes like in med when we have to interview patients and a lot of the times, the teacher would say it's a shame because like you would normally have a regular patient in front of you. And I feel that takes away from the learning experiences, especially since the patient now that we're interviewing is the doctor. For me it was rather difficult because I guess for me, especially for me, I came to med school thinking that it will be very hands-on learning."

A distinct extrinsic problem for students who were living in different countries, was the struggle with time zone differences.

"I guess the hardest part about the online learning, because I'm on the other side of the world, and time is different, it makes it hard to get proper sleep. It's hard to fall asleep before the sun comes up."

Superordinate Theme 3: Positive Adaptation through Positive Reframing

Positive adaptation was exemplified through four subordinate themes: 1) self-improvement, 2) seeing the good in online learning, 3) incorporating coping strategies, and 4) motivating factors.

Subordinate theme 1: Self-improvement

Self-improvement helped maximize the online learning experience by replacing old habits that were no longer beneficial. Participants who used to get easily agitated when disturbed became more patient and empathetic as this enabled them to communicate their needs better at home, hence promoting healthier social interactions and relationships. Some became more organized by using calendars and to-do-lists which they didn't do before. Others became more self-disciplined by rearranging their learning environment and keeping clear of any distractions. These were elaborated in the following statements:

"[I] think of a way to not look at my bed constantly and go into my bed. During my first semester I really [try] to keep my camera on even during class. My desk setup is really specific. I try to make sure that it's clear of any distractions."

Self-improvement also involved developing a healthier and positive mindset. For instance, participants who used to dwell on issues and rant about it learned to appreciate how each problem molds them into becoming a better doctor.

"Despite the pressure, I know that I keep getting better, a better student. I'll become a better doctor and a better person in general."

Subordinate theme 2: Seeing the good in online learning

The challenges encountered in online learning stressed the advantages of having certain personal qualities such as being hardworking and organized in completion of tasks. Others appreciated the advantages of having more opportunities to participate in classes and more personal time which can be used to rest, attend webinars, develop new skills and habits, exercise, and do chores. These were elaborated in the following statements:

"I think the positive thing is I'm more hardworking now."

"Being able to attend seminars on FB live, I think that's easier than before"

"Another advantage during the start of the pandemic, my friends and I started to develop this YouTube channel. We created [educational] videos."

"I was able to add more things to my routine, like doing exercise, doing household chores."

Subordinate theme 3: Incorporating coping strategies

Various coping strategies were incorporated by the participants to help adapt with online learning and this included strategic time management by knowing which tasks to prioritize, being consistent with the schedules, and keeping a routine. Coping strategies were also not limited to one's own experiences; one participant mentioned learning from others as well. These strategies were elaborated in the statements:

"I usually wake up very early because I can't sleep late like I can't stay too late like past 12 what not. What I do is, I sleep as early as 8 [PM] then I wake up at 2 [AM]."

Coping with anxiety and stress amidst the workload in online learning included lifestyle modification such as exercising and taking rests. Others started exploring non-academic activities while others started playing online games. Online shopping and connecting with people such as family and friends were also seen as beneficial. These were expressed in the following:

"Sometimes I play games, watch Netflix, hangout with my family, I check up on my friends, how they are."

"I noticed that every exam week, I really spend a lot more."

Subordinate theme 4: Intrinsic and extrinsic motivating factors

Motivating factors led to positive adaptation and fueled the participants' ambition and willingness to continue with online learning. Intrinsic motivating factors were driven by the participants' sense of passion and purpose such as their reason for pursuing medicine and a firm belief that the situation was being controlled by God. On the other hand, extrinsic motivating factors included friends and future patients. For instance, the bond between participants and their friends in medical school has strengthened their resolve to finish the school year despite it being in an online setup. These were elaborated in the following statements:

"I appreciate everyone who keeps on and doesn't give up. They push me to become better too. Seeing them motivates me as well."

"I just go back spiritually for me. If this is where God put me, that means I should go through it with a good attitude."

Superordinate Theme 4: Self-awareness as First Step Towards Adjustment

Among all nine participants, there was an increase in self-awareness, defined as recognition and acknowledgement of one's own strengths, weaknesses, stressors, and stress relievers.

Subordinate theme 1: Acceptance of their own limitations and need for self-care

Majority of the participants cited acceptance of their own limitations and need for self-care as an important realization during online learning.

"[I learned] not to force myself to keep up with others when it comes to academics. Little steps are still steps. Though the destination is far, I have also come far."

"What this setup has taught me was that there's no harm in trying. [What is most] important is to take care of myself."

Subordinate theme 2: Recognition of own strengths

Several participants gained a new recognition of their own strengths. Online learning brought about a

net decline in face-to-face social interaction, and two participants saw this as a boon to introverts.

"Online learning is good in terms of not pressuring myself to interact with other people."
"I'm more of a home buddy, I usually study alone so it wasn't that big of a problem for me."
Meanwhile, one discovered strength in resilience:
"I am resilient although I'm struggling. That is the major quality which I think I have."

Subordinate theme 3: Identifying stressors

Four participants were able to identify online learning-related stressors. Some stressors were specific to one participant only. These include school in general, Zoom calls for classes, and being forced to live at home as an eldest child.

"As much as we strive hard for success [in] this profession, we also have a lot of things to worry about."
"Since I'm the oldest, I feel responsible [for taking care of my younger sister]."
Two participants developed a cognizance of the plight of fellow Filipinos, which, when squared with their relative ease in acclimatizing to the pandemic's new normal, served as another stressor.

"With the pandemic, you also feel for the country, you also feel for your friends."
"I'm privileged enough to have a home, to have something to eat every day. My only problem is online classes, but other people's problem is what food they will be able to eat every day."

Superordinate Theme 5: Dual Role of Family During the Pandemic

Family served either as a support system, or became a detriment to well-being during the pandemic.

Subordinate theme 1: Family as support system

The families of the participants showed their support and understanding of the demands of the online learning setup in different ways. One participant stated that his family provided for his physical needs and supplies unprompted. There were also statements wherein the lack of time for family and other matters, emotions, and frustration were understood by their families. Another participant's

family helped in making decisions, another showed empathy, and gave emotional support. Under this subordinate theme, participants stated:

"As much as I like, I do want to spend time with them. They understand that this is a priority."
"They say most important is you're doing your best even if you're not feeling okay. The situation nowadays is really hard."

Subordinate theme 2: Family as a detriment to well-being

Four participants stated their families' poor understanding of the demands of medical school. Two stated that the family's concerns became a distraction and family responsibilities added to workload. The following were stated by the participants:

"Coming from a family that is not in a medical field, it's really hard for them to understand also my struggles."
"When somebody has a problem, they just ask me anytime they want. Feels like I don't have my own space to focus on my studies."

Superordinate Theme 6: Perceptions on Systemic Response

Systemic response is the overall response of the school administration with regards to the shift to online learning mainly addressing the students' concerns. Perceptions on systemic response were exemplified through two subordinate themes: 1) perceived positive systemic response and 2) perceived negative systemic response.

Subordinate theme 1: Perceived positive systemic response

Majority of the participants showed appreciation for the efforts made by the school administration to address the issues of online learning. This included empathizing with the school's struggles and appreciating policy improvements. Lecturers and the conduct of their lectures also received positive assessment from the participants as it mirrored the efforts of the lecturers in ensuring quality online education. These were elaborated in the following statements:

"Well, I can understand where the admin is coming from because they still want to provide the best education."

"Putting all the classes in one plenary for lectures so that the schedules aren't as hectic, it really helps."

Subordinate theme 2: Perceived negative systemic response

Perceived negative systemic responses included perceived lack of shared decision making between the school administration and the students which led to policy changes that brought stress to the students. These were elaborated in the following statements:

"Well for one, I think everybody can agree that it is a bit stressful, the cumulative exams that suddenly became 50%."

"They changed the grading system while the school was already ongoing. They already changed the grading system when I was still in 2nd year but it seemed like we can't do anything about it so we just have to adapt."

Others mentioned that there was a perceived apathy of administration and that there was no perceived support from school. They expressed their views as follows:

"I feel like they don't understand the struggles of their students especially they know that there is a pandemic right now and it's hard to adjust. And I don't think the administration understands its students, if they understood, they will not belittle the struggles of the students."

"For example, the main incident that I think about when I told you that they don't understand the struggle or they choose not to understand, I guess. Just like when we were asking for a one-week break. Study break after the typhoon happened where we posted "no students will be left behind" profile picture."

There is a perceived inadequate response of the administration to the mental health concerns of the students including the need for emotional support from the school administration as expressed by these statements:

"I needed professional help. I think my first hope that I will be able to get professional help is from [name of school redacted]. I tried to contact the counseling department, but I messaged them last April then they only replied this August. I don't think the department of [school] is that helpful when the students need it. Like it was a helpline that they just created so that there is a helpline."

"Looking back, I can't really exactly remember what kind of emotional or psychological support they give. Maybe they know as to the weight. The weight that the students are carrying but I guess on the emotional or psychological support side, I still find it insufficient. I really appreciate it when they check up on us like that. Even as simple as asking how we are, at least just to remind ourselves we are just students, we are just people who bear emotional weight."

Discussion

This study identified six superordinate themes: 1) positive adaptations through positive reframing; 2) resulting mental health concerns; 3) intrinsic and extrinsic concerns encountered; 4) self-awareness as a first step towards adjustment; 5) dual role of the family; and 6) perceptions on systemic response. These superordinate themes comprised and captured the lived experiences of online learning of the research participants during the COVID-19 pandemic as shown in Figure 1.
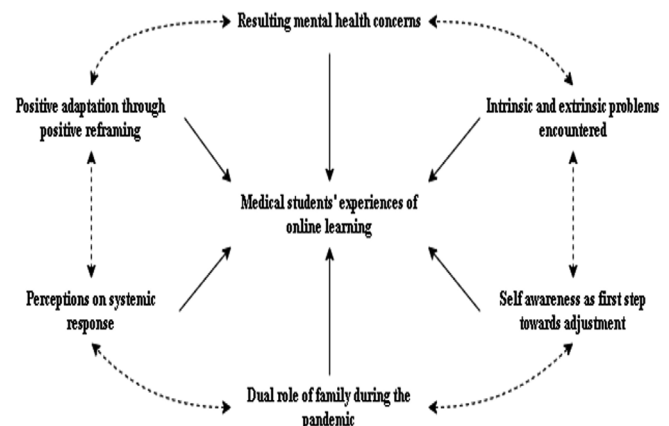
Figure 1. Superordinate themes of medical students' lived experiences of online learning.

Lived Experiences of Online Medical Students

Intrinsic and extrinsic concerns encountered

The online learning setup entailed time management skills. For instance, students were tasked to view pre-recorded lecture videos on their

own preferred time. This posed a challenge to participants who were unable to balance their time for work, studies, families, and themselves. This was similar to the result from a study which discussed that although online classes provided efficiency in time and cost, time management and learn-life balance were identified as negative aspects of online learning.[6] The students felt that online classes took too much of their time and it was difficult to do non-academic activities. This finding supports the claim that online learning requires more time than the traditional method.[6]

Regrets and doubts of entering the school and continuing medicine were experienced as the participants' expectations of the school and the online experience were not met. Certain expectations such that of a healthier environment for learning and the immediate return to the traditional set up were identified. As the participants perceived that they were not able to learn enough in the online learning setup, they felt discontented with their academic performance and developed guilt in wanting to rest.

Aside from intrinsic concerns, extrinsic concerns also emerged as a theme since the sudden shift to online education platforms caused challenges to medical students. One of the prominent challenges that surfaced in one study was attributed to setting a learning environment at home where distractions were present.[7] Structural changes such as making the student's bedroom as his classroom too, contributed to the difficulty.[8] Sufficiency of learning in the online setup was also questioned. In one study, medical students perceived that clinical practice was the inadequate part of online learning because the acquisition of clinical experiences and patient encounters was central in the discipline of medicine.[9] Lack of hospital training due to suspension of face-to-face activities made it impossible for students to have direct interactions with patients that could have enhanced their clinical assessment and physical examination skills.[10]

Dual role of family

The family played a dual role in the online learning setup. The families of the participants showed their support on the demands of the online classes. A study showed that family support positively affected intrinsic motivation which reflected the propensity to learn and assimilate.[11] However, the families also became a detriment to the well-being of the participants.

The results of this study are the families' poor understanding of the demands of medical school, and the family responsibilities as an additional workload are similar to the resulting themes of a previous study where the challenges faced by the students were the lack of understanding among family and misunderstandings of the requirements of school, and the family added more stress because additional responsibilities were expected which led to resentment and misunderstanding.[12]

Resulting mental health concerns

Participants experienced a sense of decreased wellbeing, feelings of isolation, and developing negative self-perceptions. This correlated with the findings of various studies on mental health and the impact of the COVID-19 pandemic. Medical students expressed that quarantine caused them to feel emotionally detached from family, fellows, and friends, and decreased their overall work performance and study period.[13] The findings from this study also highly suggested a relationship between prolonged quarantine due to the COVID-19 pandemic and the worsening of mental well-being among students. There was an urgent need to develop strategies to improve and ensure mental health service access, and intentionally reach out to students with special circumstances.[14]

It was found that fear and worry about the student's personal heath and their loved ones was a factor in increased levels of stress, anxiety, and depressive thoughts, which was parallel to the experience of some of this study's participants. The limited mobility of the students due to the restrictions to control the spread of COVID-19, sentiments of feeling trapped, being unable to escape the stressors in their life, and inability to perform usual coping mechanisms were aired. The learning environment was the most significant tribulation that students needed to overcome, including the limitations in learning space and facilities.[7]

Perceptions on systemic response

Perceptions on systemic response emerged as a superordinate theme since each participant shared either positive or negative experiences with regards to the school administration during the online learning setup. The challenges were not limited to

the student body only; that was why acknowledging administration efforts was an important realization. The results showed that the students have learned to empathize with the school's struggles and appreciated the policy improvements. The results showed that the students preferred pre-recorded lectures supplemented with an integration during synchronous classes. These findings were similar to a previous study where all students participating in the survey indicated that the pre-recorded modules and class exercises helped enhance their learning, and that the hybrid course design effectively combined active and passive learning methods.[15] Perceived lack of shared decision making with the school administration also emerged. Policy changes in the grading system brought stress to the students which was supported by a study that showed that the grading system affected the decision of students about how much effort to exert.[16] Feeling emotionally unsupported when attending university was a key predictor of psychological distress and burnout while feeling supported reduced this risk.[17]

Adaptations developed during online learning in the time of COVID-19

Self-awareness as first step for adaptation

An increase in self-awareness among the participants—whether pertaining to their own strengths and limitations, or the aspects of their lives as medical students that act as stressors and stress-relievers—may be seen as a positive step towards adapting to the "new normal" of online medical education. Under the lens of objective self-awareness, a person may "experience either positive or negative affect, depending on whether attention is directed toward a positive or negative discrepancy" between one's expectations and reality.[18] If online medical students selectively focus their attention on the positive aspects of their lives during the pandemic—such as greater control over their schedule and increased time to pursue other interests—then a positive internal outlook may be achieved despite the gloomy external prospects brought about by living through a pandemic.

Positive adaptations through positive reframing

Echoes of self-awareness as the springboard for adjustment were observed. As a result of their awareness of their strengths, limitations, stressors, and

stress-relievers, many of the participants have been able to adopt strategies to cope with the pandemic's numerous challenges. The study identified four different strategies to overcome the new challenges brought by online learning: self-improvement, seeing the good in online learning, incorporating different coping mechanisms, and having various motivational sources.

Self-improvement can be influenced by positive emotions by leading individuals to engage in positive behaviors.[19] This involves developing patience and empathy to better communicate their needs. The learning environment at home turned out to be the greatest challenge in online learning mainly because of the distractions at home (e.g., noise) and limitations in learning spaces beyond their homes.[7] The value placed on good communication within household members suggested its importance in addressing home learning environment concerns.[7] Others used their own individual qualities (e.g., being an introvert) and preferences to further maximize their online learning experiences. This seems to be linked with a previous study saying introvert students were able to be more participative as they were allowed to find their own voice online.[20] Students being in their comfort zones eased their anxieties which further improved their performance.[9] Positive views had a great impact in the adaptations of the participants. Positive thinking in the face of struggles had an effect on their actions towards these challenges. These actions included perseverance through the challenge despite the difficulties faced.[21]

Adjustments to online learning included time management strategies (e.g., sticking to routine, making to-do lists, organizing tasks according to difficulty), seeking advice from peers, and knowing the importance of de-stressing. Planning tasks and seeking emotional support from peers were recognized as active coping strategies.[22] In a local study, students who were more active in combining active coping strategies were more likely to be better adjusted in their academic, social, and mental health.[23] Gaming was a strategy also used to deal with academic stress. This had been explored in one study which showed an increase in gaming activities during times of examination-related stress, and how helpful it was in managing the stress felt.[24]

Motivating factors influenced the decision to continue online education. Students struggled with being less motivated during online learning due

to less collaboration and interaction with teachers and classmates—the lack of which can cause medical students to feel discouraged, lose interest, and abandon their studies as affected by feelings of resignation.[25,26] This study identified two types of motivating factors: the intrinsic and extrinsic. The intrinsic motivating factors were driven by the participants' internal reasons such as their sense of passion and purpose, eagerness for self-improvement, reason for pursuing medicine, and spiritual beliefs. This paralleled previous findings which showed that the motivation of medical students toward the changes and challenges in the time of the COVID-19 pandemic were intrinsically affected by their sense of purpose or duty and altruism.[27] Extrinsic motivating factors were driven by the outcome of the actions of the participants towards their friends and future patients, and how their performance would impact the relationship and management of their future patients. Peers and organizational support contributed to lower dropout rates of adult online learners.[28]

Conclusion

In conclusion, the phenomenon of online medical education during the pandemic resulted in problems and mental health concerns among participants, and many developed self-awareness and positive adaptations specific to the online setup. Participants' families helped some adjust, while living with loved ones posed an additional challenge to others. Both positive and negative perceptions of systemic response of the school administration also arose.

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Outcome of babies at 8-12 months old who tested positive for COVID-19 at birth in two tertiary medical centers

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Abstract

Introduction Scant information remains regarding the outcome of babies who tested positive for COVID-19 at birth beyond two months of age. This study determined the outcome of infants at 8-12 months old who tested positive for COVID-19 at birth.

Methods This is a non-concurrent cohort study. A review of medical records at birth and at wellness check at 8-12 months was done. The weight, Z-scores, episodes of upper respiratory tract infection and number of non-routine consults were compared between the babies who tested positive at birth with those whose test was negative for COVID-19. Asymptotic 2-tailed p value = 0.05 determined significance of differences of variables.

Results From August to October 2020, 31 newborns tested positive for COVID-19; 31 tested negative, and all had an unremarkable outcome at birth. Nine (p = 0.001) mothers tested positive for COVID-19. COVID-19 babies weighed statistically significantly less than the non-COVID-19 babies (8.5 ± 0.87 vs 9.7 ± 0.89 kg, p = 0.010) at 8-12 months. There was no statistically significant difference when the z-scores were considered (p = 0.313). As of last wellness check, babies who tested positive at birth had more episodes of upper respiratory tract infections (19.6% vs none, p= 0.010) and non-routine consultations.

Conclusion Twenty nine percent of newborns tested positive if mothers tested positive for COVID-19. At 8-12 months old, babies who tested positive for COVID-19 at birth had more episodes of upper respiratory tract infections.

Key words: Outcome, newborns, COVID-19

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2020 marked the start of the pandemic caused by SARS-CoV-2 or COVID-19, effectively requiring those involved in the care of pregnant women and their newborns to constantly review guidelines to minimize mortality and morbidity in this vulnerable population. The need to recognize that these infants remain at risk can be ascertained from a multinational cohort study of 2130 pregnant women in 18 countries that showed women with COVID-19 were at increased risk of a composite maternal morbidity and mortality index. Newborns of women with COVID-19 had significantly higher severe neonatal morbidity index and severe

perinatal morbidity and mortality index compared with newborns of women without COVID-19.[1]

Since COVID-19 is highly transmissible, concern whether current practices of keeping the baby with the mother as much as possible would be advisable as concerns regarding morbidity and mortality remain. Blumberg stated the while these patients appear to have acquired infection either by intrauterine or intrapartum transmission, establishing clear definitions for such transmission is warranted.[2] Huntley pointed at that early in the pandemic, there has been reassuring data on low rates of maternal and neonatal mortality and vertical transmission with SARS-CoV-2.[3]

Tran stated while that there is insufficient evidence to suggest vertical transmission between mothers and their newborn infants, transmission may happen after birth from mothers or other caregivers.[4] Prolonged skin-to-skin contact and early and exclusive breastfeeding remain the best strategies to reduce the risks of morbidity and mortality for both the mother with COVID-19 and her baby.[4] Ronchi provided evidence on the management of mother-infant dyads with maternal COVID-19 infection and suggested that rooming-in and breastfeeding can be practiced in women who are able to care for their infants.[5] Although the American Academy of Pediatrics promoted rooming-in and breastfeeding with precautions, social adversity may play a role given that the COVID-19 pandemic has disproportionately affected racial/ethnic minority populations. In addition, it was observed that the specific pathways by which social disadvantage might affect mother-to-child transmission of SARS-CoV-2 include differential access to care and clinician bias.[6]

A year later into the pandemic, there is now considerable information accumulated and shared about the effects of SARS-CoV-2 on pregnant women and their newborns. In contrast, there remains a paucity of information regarding the outcome of babies at eight weeks or older who tested positive for SARS-CoV-2 at birth.[1] Flaherman observed that maternal viral infection in pregnancy and the peripartum and postpartum periods can adversely affect infant outcomes. While studies have reported that maternal SARS-CoV-2 infection increases the risk of preterm birth and can be vertically transmitted, overall risks for infants born to mothers with SARS-CoV-2 are not yet well-described. Current national and international guidelines for the management of infants born to mothers with SARS-CoV-2 are based on limited data without outcomes reported past the neonatal period.[7]

This study determined the outcome at 8-12 months old of infants who tested positive at birth for SARS-CoV-2 and specifically 1) identified the demographics of the mothers and their infants born from August to October 2020; 2) compared the demographics of mothers who tested positive with those who tested negative, with the outcome of their infants at birth and at 8-12 months old as to body weight and gross developmental outcome; and 3) compared the rate of illnesses and non-routine consultations of babies who tested positive for SARS-CoV-2 at birth with those who tested negative.

Methods

This is a non-concurrent cohort study of COVID-19 positive and COVID-19 negative babies born from August to October 2020 in two hospitals who were followed up at 8-12 months. One hospital was a tertiary government medical center and the other was a private tertiary hospital located in the same vicinity. Both hospitals were referral centers for COVID-19 patients. The study was approved by the ethics committees of both hospitals, respectively. Informed consent was obtained from the parents of babies included in the study.

The babies were identified from the census of the Department of Pediatrics of the two hospitals and their records were retrieved. The following data were extracted from the records: maternal data (age, gravida status, parity, manner of delivery); newborn data (birthweight, Ballard score, APGAR scores, Z-score); results of SARS-CoV-2 swab of mothers and their newborns at birth; wellness check by telemedicine at 8-12 months (inquiries if there were illnesses, reminders on breastfeeding and immunization schedule, recording of weight during immunization at local health center and gross developmental milestones), episodes of upper respiratory tract infection (URTI) and number of non-routine consultations. The wellness check by telemedicine is considered standard of care to follow up infants born due to limitations brought upon by the pandemic (such as lack of public transportation, surges of COVID-19 admissions in institutions, among others). Only asymptomatic or well infants were included for "Well-Baby OPD" or wellness check by telemedicine.

Chi-square and t-test were used to determine significant differences between the COVID-19 positive and COVID-19 negative babies at $\alpha = 0.05$ for categorical and continuous variables, respectively. The data were analyzed using SPSS.

Results

The records of 62 newborns were reviewed for this study. There was an equal number of COVID-19 positive and COVID-19 negative babies. As shown in Table 1, the mothers of the two groups were comparable in terms of age, number of pregnancies and parity. Around 30% of mothers of COVID-19 babies tested positive by rt-PCR (p = 0.001). A third of the mothers of COVID-19 positive babies underwent cesarean section (p < 0.001). Table 2 shows that the sex distribution, birth weights, Z-scores and Ballard scores were similar for the COVID-19 and the non-COVID-19 babies. The APGAR score of the COVID-19 babies was higher at one minute; this was statistically (p = 0.027) but not clinically significant. Of the COVID-19 newborns, 22 had cough and colds but had good suck. Based on their medical records, all the newborns in this study received exclusive breastfeeding during the first six months of life, received their primary series of immunizations on time at the nearest or local health center or facility, and except for a baby with Down syndrome, all were able to achieve their expected gross developmental milestones on time.

As shown in Table 3, the COVID-19 babies weighed statistically significantly less than the non-COVID-19 babies (8.5 ± 0.87 vs 9.7 ± 0.89 kg, p = 0.010) at 8-12 months. There was no statistically significant difference when the z-scores were considered (p = 0.313). A fifth of the COVID-19 babies had episodes of URTI compared with none in among the non-COVID-19 babies (p = 0.010). The common symptoms were cough and colds; none had fever. This led to non-routine consultations in 3 of the 31 COVID-19 babies.

Discussion

Adherence to best practices in managing pregnant women and their newborns is critical in ensuring good outcome: healthy infants. Since the start of

Table 1. Demographic and clinical characteristics of mothers whose babies tested positive for COVID-19 and mothers of babies who tested negative for COVID-19.

Characteristic n (%)	COVID-19 positive babies n = 31	COVID-19 negative babies n = 31	p-value*
Age (years) (mean $\pm$ SD)	28.2 $\pm$ 7.3	27.2 $\pm$ 6.6	0.564
Gravida			
1st pregnancy	9 (29.0%)	15 (48.4%)	
2-4 pregnancies	16 (51.6%)	15 (48.4%)	0.078
> 4 pregnancies	6 (19.4%)	1 (5.2%)	
Parity			
1st parity	9 (29.0%)	16 (51.6%)	0.086
2-4th parity	17 (54.8%)	14 (45.2%)	
> 4 parity	5 (16.1%)	1 (3.1%)	
Manner of delivery			
NSD	20 (64.5%)	31 (100.0%)	< 0.001
CS	11 (35.5%)	0 (0.0%)	
COVID-19 RT-PCR results			
Positive	9 (29.0%)	0 (0.0%)	0.001
Negative	22 (71.0%)	31 (100.0%)	

*Chi-square/t-test
NSD – normal spontaneous delivery; CS – cesarian section

Table 2. Demographic and clinical characteristics of babies who tested positive for COVID-19 and babies who tested negative for COVID-19 at birth.

Characteristic n (%)	COVID-19 positive n = 31	COVID-19 negative n = 31	p-value*
Birth weight (kg) (mean ± SD)	2.82 ± 0.56	2.9 ± 0.41	0.530
SGA	6 (19.4%)	4 (12.9%)	
AGA	24 (77.4%)	24 (77.4%)	
LGA	1 (3.2%)	3 (9.7%)	0.497
Z-score			
Above 2	1 (3.2%)	0 (0%)	
Below -2	4 (12.9%)	3 (9.7%)	0.327
Below -3	2 (6.5%)	0 (0%)	
Median	24 (77.4%)	28 (90.3%)	
Ballard score (weeks)	38.52	38.52	1.000
APGAR (Mean)			
1 minute	8.77	8.48	0.027
5 minutes	9	9	
Sex			
Male	16	15	0.799
Female	15	16	

* Chi-square/t-test
SGA – small for gestational age; AGA – appropriate for gestational age; LGA – large for gestational age

Table 3. Demographic and clinical characteristics of babies who tested positive for COVID-19 and babies who tested negative for COVID-19 at birth on wellness check at 8-12 months old.

Characteristic n (%)	COVID-19 positive n = 31	COVID-19 negative n = 31	p-value*
Age (months) at wellness check			
8-9 months	8 (25.8%)	0 (0.0%)	
10- 11 months	10 (32.3%)	15 (48.4%)	
> 11 months	13 (41.9%)	16 (51.6%)	0.010
Weight (kg)	8.5 ± 0.87	9.7 ± 0.89	< 0.001
Z-score			
Below -2	1 (3.2%)	0 (0.0%)	0.313
Median	30 (96.8%)	31 (100.0%)	
Illness (URTI)			
None	25 (80.6%)	31(100.0%)	0.010
URTI	6 (19.6%)	0 (0.0%)	
Non- routine consultations			
No	28 (90.3%)	31 (100.0%)	0.076
Yes	3 (9.7%)	0 (0.0%)	

* Chi-square/t-test
URTI – upper respiratory tract infection

the pandemic, guidelines have become the lifeline of daily clinical practice, including that of a mother previously identified as COVID-19 positive or under investigation for COVID-19 is asymptomatic or paucisymptomatic at delivery, rooming-in is feasible, and direct breastfeeding is advisable under strict measures of infection control.[2,5]

In this study, mothers who tested positive for COVID-19 at birth posed a significantly higher risk for their newborns to test positive to COVID-19. Potential mechanisms of maternal transfer of SARS CoV-2 to the infant have been proposed: 1) intrauterine transmission through transplacental hematogenous spread or viral particles in amniotic fluid that are ingested or inhaled by the fetus; 2) intrapartum transmission after exposure to maternal infected secretions or feces around the time of birth; and 3) postpartum transmission from an infected mother, family member, or health care worker (probably the most likely mode of pre-vaccine transmission). Transmission from an infected mother is more likely from respiratory secretions and less likely from breast milk. Among the three mechanisms, intrauterine transmission is the least likely.[8]

Hence it made sense to keep newborns together with their mothers as much as possible even if mothers tested positive for COVID-19. It was likewise in the best interest of mothers and their newborns, regardless of the mothers' results for COVID-19 test, to adhere to the WHO recommendation to keep mothers and infants together, and allow direct breastfeeding with careful breast hygiene.[9] That breastfeeding remains the best option for newborns is the presence of antibodies to COVID-19 found in infants born to mothers with COVID-19 and in the breast milk of mothers with COVID-19.[4,8] The normal weight of babies included in this study as of last wellness check based on Z-score may be due to the practice of rooming in and early breastfeeding as soon as feasible, and exclusive breastfeeding up to six months old.

Upon discharge from the hospital, the mothers were instructed to avail of the telemedicine services of the Department of Pediatrics since all the infants were considered high-risk regardless of the results of RT-PCR for COVID-19. Since there were several restrictions brought on by the pandemic, wellness check by telemedicine was among the most feasible ways to remind the mothers to sustain exclusive breastfeeding at least for the first six months of life, to go to the nearest health facility/center for immunizations, as well as to check on the general well-being of the babies.

Evidence of abnormal brain MRI findings was noted in neonates with COVID-19, though there were no signs of abnormal growth development among them.[10] At present, it cannot be concluded that the abnormal brain MRI findings were caused by SARS-CoV-2; therefore, the neonates born to mothers with COVID-19 may be followed-up as per routine health care schedule but their routine neurodevelopmental surveillance should be evaluated by further study.[10] This is the main reason why the neurodevelopmental outcome of these babies remains a concern. While babies in this study did not undergo cranial MRI and thus there is no information on the status of their brains, all had normal gross developmental milestones or outcomes as of their last wellness check. There was one baby who tested positive for COVID-19 at birth and was diagnosed to have Down syndrome. COVID-19 infection has not been considered a risk factor for Down Syndrome.

Early in the pandemic, there has been reassuring data on low rates of maternal and neonatal mortality and vertical transmission of SARS-CoV-2. The preterm birth rate of 20% and the cesarean delivery rate exceeding 80% seems related to geographic practice patterns not related to SARS-CoV-2.[3] This is reflected in current data showing that although a significant number of mothers who tested positive for COVID-19 underwent cesarean section (p < 0.001), the rate of cesarean section done in both institutions did not increase compared to previous years (< 35%).

Recognizing that SARS-CoV-2 is highly transmissible, questions persisted on whether current practices of keeping the baby with the mother as much as possible would be advisable as concerns regarding morbidity and mortality remain. Flaherman stated that infant outcomes after maternal SARS-CoV-2 infection are not well-described. In a prospective US registry of 263 infants, maternal SARS-CoV-2 status was not associated with low birthweight, difficulty of breathing, apnea, or upper or lower respiratory infection through 8 weeks of age.[7] Beyond 8 weeks old, there is a lack of data regarding the outcome of babies born during the pandemic and more data is needed especially on babies who tested positive for COVID-19 at birth.

As of last wellness check, a significant finding among the babies in this study is that those who tested positive for COVID-19 at birth had more

episodes of URTI as compared to those who tested negative. Babies who tested positive for COVID-19 at birth likewise, had more non-routine consultations although the difference was not statistically significant when compared to those who tested negative at birth, consistent with the findings of Angelidou.[6] The findings emphasize the importance of both biological and social factors in perinatal SARS-CoV-2 infection outcomes. Newborns exposed to SARS-CoV-2 were at risk for both direct and indirect adverse health outcomes, supporting efforts of ongoing surveillance of the virus and long-term follow-up.[6]

Twenty nine percent of newborns tested positive for COVID-19 if mothers tested positive compared to none among the COVID-19 negative mothers. At 8-12 months old, babies who tested positive on RT-PCR at birth had more episodes of URTI (19.6%). It is recommended that close follow-up of neonates who tested positive to COVID-19 be done up to one year and even beyond to monitor their growth and development, enhance sustained breastfeeding, ensure timely immunizations as well as to facilitate their prompt access to health care.

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The Filipino family in a pandemic: A cross-sectional study on the state of the household environment of COVID-19 patients in the Philippines

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Abstract

Introduction Under COVID-19 guidelines, families are spending extended hours together within a limited physical space, giving rise to a living situation that can bring families closer together and/or lead to conflicts. This study aimed to determine the current state of household cohesion and conflict among families with confirmed COVID-19 cases in the Philippines.

Methods This was a cross-sectional study using the COVID-19 Household Environment Scale (CHES) as a self-administered questionnaire among adult persons who belonged to households with at least one family member previously diagnosed or currently with COVID-19 in August and September 2021. Participants were recruited online using convenience and snowball sampling. The CHES is a 30-item tool which measures conflict and cohesion through the Conflict and Togetherness Subscales, respectively.

Results The composite median values of 386 participants surveyed reveal scores that were clustered to the left for the Conflict Subscale and neutrality for the Togetherness Subscale.

Conclusion There is a general increase in household conflict and a non-significant change in togetherness among the surveyed families. The composite median values, if taken compoundly, imply the existence of more conflict and less togetherness.

Key words: COVID-19, family household, CHES

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COVID-19, as defined by the World Health Organization (WHO), is caused by a beta coronavirus called Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV2). The virus was described to be "highly contagious, can spread quickly, and must be considered capable of causing enormous health, economic, and societal impacts in any setting."[1] The current health crisis has caused widespread social and economic disruption with grave consequences affecting individuals and sectors of society including families whose day-to-day living has been disrupted. With the panic and uncertainty surrounding coronavirus

and the institution of lockdowns, families are left with no choice but to stay within the confines of their homes, with day-to-day activities that were previously conducted outside, such as school and work, being done at home. This situation coupled with the struggle to cope with the effects of the pandemic holds the potential to give rise to both family cohesion, as household members are given frequent opportunities to spend time and overcome struggles together, and family conflict, as they are collectively facing a stressful situation in an environment devoid of opportunities to spend time outside the home.[2] While there are a number of currently available tools aiming to measure the quality of family life such as the Family Environment Scale and the Family Life Questionnaire, most if not all fail to capture how quarantine and social distancing measures affect the unique household experiences of families in the COVID-19 pandemic.[3,4]

The general objective of this study was to determine the current state of household cohesion/togetherness and conflict among families with confirmed COVID-19 cases in the Philippines. The specific objectives were to: 1) determine the median values of household cohesion/togetherness and conflict among families with confirmed COVID-19 cases; 2) determine the median value of each item in each subscale; 3) classify the subscale items into the familial domains of Parenting, Work-Family Balance, Caregiving, Finances, Communication and Mutuality, Religion and Spirituality, Recreation, and Family Meals; and 4) highlight possible factors explaining the median values of the items in each familial domain.

Methods
This research employed a descriptive, cross-sectional design using a self-administered questionnaire describing the household environment of families of COVID-19 patients in the Philippine setting. All data were gathered between August and September of 2021. The study was approved by the UERMMMCI Ethics Review Committee.

Eligible participants included males and females aged 18-59 years old who belonged to families with at least one member who had tested positive for COVID-19, were residents of the Philippines, and were living in the same house as the patient who tested positive for COVID-19. Only one member from each qualified family, regardless of his or her familial role, represented the collective sentiments of all members

to avoid skewing and redundancy of data. Those who had another family member already approved as a participant were excluded from the study.

The sampling population was selected through a combination of convenience and snowball sampling. Convenience sampling was done through posting of online advertisements or posters in established COVID-19-related social media groups as well as through the researchers' personal social media profiles. The survey forms also included a closing statement encouraging the participants to send the survey to other qualified individuals outside of their household. Both symptomatic and asymptomatic cases were included in the study to reduce the risk of making exclusions that may lead to inaccurate notions about the severity of cases. There were no restrictions in terms of gender, occupation and socioeconomic status in the inclusion and exclusion criteria to ensure the representativeness of the sample. The computation of the sample size was done through OpenEpi using the formula for proportion and descriptive studies. The sample size was computed to be 384 with a 95% confidence interval, referenced with the total number of recorded COVID-19 cases in the Philippines at the time of writing the proposal.

The COVID-19 Household Environment Scale (CHES) is a tool to assess the effect of social distancing within families on household conflict and household togetherness.[2] The CHES is divided into two sections, with Section 1 consisting of 25 descriptive items aiming to describe individual characteristics (age and gender), household characteristics (number of people in the home), and household exposure to COVID-19 (whether any member of the family tested positive for COVID-19 and job loss due to the pandemic). Section 2 measures family conflict and cohesion/togetherness using the Household Conflict and Household Togetherness Subscales, each with 15 items. Questions aimed to describe the state of conflict and togetherness in terms of varied household activities before and during social distancing. For each statement indicating a specific household activity, the participants were instructed to describe the extent of conflict or togetherness relative to pre-pandemic times through the options "much less than before", "a little less than before", "the same as before", "a little more than before", and "much more than before". Participants were also asked to indicate if a statement did not apply to their household or if they preferred not to answer it. The two subscales test

for household conflict (α = 0.847) and household cohesion (α = 0.847). Confirmatory factor analysis showed the following values: root mean square error of approximation (RMSEA) = 0.057, comparative fit index (CFI) = 0.729, Tucker-Lewis Index (TLI) = 0.708, and standardized root mean squared residual (SRMR) = 0.098.

The researchers utilized *Google Forms* as the medium for dissemination of the self-administered questionnaire. The duration of participation in the study was only the time the participants were answering the questionnaire and no further engagement was initiated beyond this. Messaging applications were also used to explain the details of the study to interested participants who needed further clarification. Before answering the virtual questionnaire, the participants were asked to sign an informed consent form consisting of a single page with information on the research and the request for authorization to use data.

The scores for each item in the Togetherness Scale were coded into numerical values of 1 to 5 (1 for "much less than before" and 5 for "much more than before") while items in the Conflict Scale were reverse coded. The median values of the composite scores of each subscale and the composite scores of the items in each subscale were obtained. In analyzing the data, the score of 3 which implies neutrality was set as the reference point against which the median values were compared, such that a score below 3 would indicate more conflict and less togetherness and a score above 3 would suggest more togetherness and less conflict

relative to before the COVID-19 diagnosis in the household.

Results

CHES was administered to 386 participants, of which 222 (57.5%) belonged to the 18-24 year-old group, 101 (26%) to the 25-31 year-old age group, with the rest distributed among the other age groups. Two hundred eighty (72.5%) respondents were female, 99 (25.6%) male, and 7 (1.8%) non-binary. Among them, 275 (71.2%) were college graduates, 54 (13.9%) high school graduates, and 57 (14.7%) post-graduates. Fifty-three families (13.7%) did not own their home. As seen in Table 1, 57 (14.8%) families had at least one adult member who required caregiving, 19 (4.9%) families had at least one child with a disability or special healthcare need, 110 (28.5%) families had at least one member who required hospitalization when he/she had COVID-19, and 125 (32.4%) families had at least one member who stopped working because of COVID-19. Sixty-nine (17.9%) families have had a member pass away from COVID-19 and/or its related complications, 106 (27.5%) families had a member working in healthcare with direct patient contact currently residing in the home, and 205 (53.1%) families had a member working in a job considered to be at a high risk of contracting COVID-19.

Table 2 shows the composite medians and percentage of each answer. Around 90% answered "same as before" and "a little more than before" in the

Table 1. Descriptive statistics of household background.

Characteristics	Mean ± SD	Range of scores (min, max)
No. of people living in the home	5.5 ± 3.00	1, 42
No. of bedrooms in the home	3.6 ± 1.69	0, 12
Time practicing social distancing	2.6 ± 1.10	1, 4
No. of family members who tested positive for COVID-19	2.3 ± 1.66	1, 12
No. of COVID-19 (+) family members with symptoms	2.0 ± 1.55	0, 12
No. of people who are not members of the family	0.5 ± 1.10	0, 7
No. of adults ≥ 65 y/o	0.5 ± 0.78	0, 5
No. of adults requiring caregiving	0.2 ± 0.50	0, 3
No. of children < 5y/o	0.2 ± 0.51	0, 3
No. of children 5-11 y/o	0.2 ± 0.55	0, 3
No. of children 12-18 y/o	0.4 ± 0.69	0, 4
No. of children with special healthcare needs	0.1 ± 0.23	0, 2
No. of members who required hospitalization	0.4 ± 0.64	0, 4
No. of adults working from home	1.4 ± 1.32	0, 10
No. of adults who stopped working due to COVID-19	0.5 ± 0.89	0, 5

Conflict Subscale and 80% answered "same as before" and "a little more than before" in the Togetherness Subscale. The composite median for the Conflict Subscale is clustered to the left of the reference score of 3 while the composite median for the Togetherness Subscale indicated neutrality. The percentages of answers for each subscale denote a rough estimate. Table 3 shows the composite median scores for each item on the Conflict and Togetherness Subscales. Most answers to items in the Conflict Subscale showed scores that were clustered to the left, except for a few items indicating neutrality. On the other hand, the Togetherness Subscale shows a neutral tendency for most items while the others leaned towards the positive side except for "involvement in children's education".

Discussion

The analysis of data reveals a general increase in household conflict among families with at least one member who was diagnosed with COVID-19 in terms of the activities described in the Conflict Subscale. On the other hand, a generally neutral response is observed for the items in the Togetherness Subscale, reflecting a non-significant change in togetherness relative to the described activities in the said subscale. The medians of both datasets, if taken as a composite value, are clustered in the lower end of the scale, implying the existence of more conflict and less togetherness among the household members of the surveyed participants.

A plausible explanation for these findings would be the characteristics of the sample such as having adult family members requiring caregiving, members with disabilities or a special healthcare need, members requiring hospitalization due to COVID-19, and family members who stopped working because of the pandemic. Furthermore, the results reveal that some families had already lost a family member due to COVID-19 and/or its related complications,

Table 2. Descriptive statistics of subscale composite medians.

Scale	Median	Answers (%)				
		5/1	4/2	3/3	2/4	1/5
Conflict*	2	6.8	-	55	36	2.6
Togetherness**	3	1.8	8.6	46.1	38.9	4.6

* 5 - much less than before; 4 - a little less than before; 3 - the same as before; 2 - a little more than before; 1 - much more than before

** 1 - much less than before; 2 - a little less than before; 3 - the same as before; 4 - a little more than before; 5 - much more than before

Table 3. Comparison of median scores of items under the Conflict and Togetherness Subscales.

Conflict		Togetherness	
Spending leisure time together	3.00	Spending leisure time together	3.00
Parenting or childcare	1.00	Engaging in conversation	3.00
Children's schoolwork	1.00	Involvement in children's education	3.50
Decisions about health	1.00	Doing fitness activities together	2.00
Decisions about going out	3.00	Facing challenges together	4.00
Decisions about visitors	3.00	Helping each other	4.00
Home maintenance	2.00	Sharing household tasks	3.00
Personal hygiene	1.00	Running errands together	3.00
Food	2.00	Eating together	4.00
Work or employment	2.50	Showing concern/support	3.00
Finances	2.00	Showing affection	0.00
Privacy or personal space	3.00	Physical intimacy	3.00
News or social media	2.00	Sharing religious/spiritual activities	3.00
Alcohol, tobacco, drug use	0.00	Sharing material resources	3.00
Politics	2.00	Helping others together	3.00

were living with family members working in healthcare or working in jobs that are at high-risk for contracting COVID-19. All such factors, in the context of stringent social distancing and quarantine measures, may be considered as potential sources of social disharmony as these may undeniably lead to disruption of life and financial difficulties, and predispose family members to feelings of anxiety, depression, and fear.[2,5] Under the prescribed health protocols, family members are required to stay within the limited physical space of their home for extended periods of time, inevitably leading to more frequent interactions. Certainly, however, frequent interactions do not necessarily equate to an increased quality of familial relations as this would be defined by the nature of interactions they have. While family members have more opportunities to spend time with each other, they are also highly susceptible to conflict as they are together for longer periods of time while facing a stressful event.[2]

Although the previously mentioned generalities are important in grasping the overall nature of the responses, it was deemed necessary by the researchers to explore certain domains covered by the items in the data collection questionnaire to gain a deeper understanding of the results. Hence, the succeeding paragraphs will expound on the familial domains specified in the specific objectives: Parenting, Work-Family Balance, Caregiving, Finances, and sources of family support in stressful life circumstances including Communication and Mutuality, Religion and Spirituality, Recreation, and Family Meals. For discussion purposes, the items in each subscale were classified by the researchers into these familial domains, as shown in Table 4, in accordance with the study's specific objectives. The survey items "alcohol, tobacco and drug use" from the Conflict Subscale, and "physical intimacy" from the Togetherness Subscale were excluded as majority of the participants answered either "does not apply to my household" or "I prefer not to answer" to these questions.

Parenting

The rapid spread of COVID-19 prompted measures such as community quarantine and school closures to prevent the further transmission of the virus, resulting in an increase in parenting stress associated with financial strain and lack of educational services.[6,7] The results are aligned with sociological

perspectives in parenting which point to a double burden of work, childcare duties, and daily routines for other family members that resulted from the closure of schools during lockdowns. The parents, especially the mothers, were compelled to manage the demands of their work along with additional responsibilities in relation to children's schoolwork and welfare, and other household routines amid the quarantine and recovery period. Thus, the parents were likely to experience scarcity of time, most likely affecting other aspects of parenting especially the children's school work.[8,9]

The stay-at-home restrictions and isolation in health facilities caused a sudden change in the routine of both the parents and their children including the limitation on social contacts and leisure activities outdoors, thus, causing a conflict in restructuring daily life. The significant reduction in the social interaction among children also exacerbated loneliness. This resulted in a shift to digital recreation, increasing the risk of gaming addiction, reduction in family interaction, change in behavior, and poor school performance among children if parental supervision failed. The data present no change in conflict and togetherness in the aspect of "spending leisure time together" suggesting that parents were able to adapt, understand, and utilize the shift to digital leisure and communication which possibly strengthened family relationships, parent-child interactions, and understanding of their children's interests.[8,10,11] This interpretation is supported by an increase in togetherness in the aspect of "showing concern/support" and "facing challenges together".

Work-Family Balance

The COVID-19 pandemic caused alterations in the daily living of families that changed their family dynamics within the household environment.[6] The findings suggest that the COVID-19 pandemic caused an increase in conflict in relation to "home maintenance", and "work or employment", while there was no change in conflict in relation to "spending leisure time together" under the domain of Work-Family Balance.

The increasing demands from both family and work responsibilities amid the pandemic posed a significant familial conflict following possible contentions of the different roles of the family members. This is consistent with comparable literature which argues

Table 4. Relation of items in the Conflict and Togetherness Subscales with specific domains.

Domain	Conflict Subscale	Togetherness Subscale
Parenting	Spending leisure time together Parenting or childcare Children's schoolwork Work or employment Finances	Spending leisure time together Doing fitness activities together Involvement in children's education Facing challenges together Helping each other Eating together Showing concern/support, Showing affection Physical intimacy
Work-family balance	Spending leisure time together Home maintenance Work or employment Finances	Spending leisure time together Doing fitness activities together Involvement in children's education Facing challenges together Sharing household tasks Running errands together Eating together Physical intimacy Helping others together
Caregiving	Parenting or childcare Decisions about health Personal hygiene Finances	Involvement in children's education Helping each other Showing concern/support, Showing affection Helping others together
Finances	Home maintenance Personal hygiene Food Work or employment Finances Alcohol, tobacco & drug use	Sharing material resources
Communication and mutuality	Decisions about health Decisions about going out Decisions about visitors Finances Privacy or personal space News or social media Politics	Engaging in conversation Eating together Showing concern or support Showing affection Physical intimacy Sharing material resources Helping others together
Religion and spirituality	---	Sharing religious or spiritual activities
Recreation	Spending leisure time together Decisions about going out Decisions about visitors Finances News or social media Alcohol, tobacco, and drug use	Spending leisure time together Doing fitness activities together Running errands together Eating together
Family meals	Food Finances	Eating together

that the growing expectations required of them contribute to role conflict.[12] As the interplay between the two took place within the household especially during the lockdown period, it made separation of the roles difficult, with no clear boundaries between work and personal life, thus further increasing stress and enhancing proliferation of role conflict. Additionally, families who are economically disadvantaged because their current work or employment was affected by pandemic-related work dismissals were more likely to present with increasing stress levels and inter-role issues. Recent research has also shown that mothers continue to struggle with juggling work and family responsibilities while they are working from home.[13,14]

Family togetherness in general may promote rediscovery of basic family values, reconciliation, and bring about improvement in the emotional and psychological states of families.[15] However, given the drastic changes that families went through during the pandemic such as financial insecurity, unemployment, suboptimal work/home environment, and family responsibilities, a sense of familial charity was eroded. On the opposite subscale, the data show that there was decreasing togetherness in relation to "involvement in children's education" while there was no change in relation to "running errands together" and "helping others together" under the work-family balance domain.

The findings of the study are consistent with similar research that parents consider juggling both their workload and parental tasks of home-school supervision frustrating.[15] Moreover, parents and adolescents are faced with more daily hassles in school and work and additional tasks such as homeschooling which may contribute to the likelihood of parental disengagement from supervising children's education. Spouses may also have no sufficient time together during the pandemic as they were constantly attending to work demands and parental roles. The impact of the pandemic also complicated marital relationships, giving way to intensified parental vulnerabilities, making it more difficult to effectively maintain relationship satisfaction. Couples may have reduced physical contact and intimacy following the changes of their work schedules, especially among frontline workers who are expected to practice social distancing at home.[16]

Caregiving

The COVID-19 pandemic has transformed the ways people interact with one another. Two groups that are significantly affected by this are those needing care and those providing the care needed.[17] This study suggests that the COVID-19 crisis has caused an increase in conflict regarding "parenting/childcare", "decisions about health", and "personal hygiene" under the caregiving domain. On the opposite subscale, there is less togetherness in relation to "involvement in children's education" but more togetherness in "helping each other" and "showing concern/support".

With the closure of schools, children were forced to stay at home and parents had to adjust their daily routines to incorporate childcare and homeschooling. This may have compromised their time to tend to their own well-being to meet the caregiving demands of their children.[18] Parenting stress during the pandemic could reduce the quality of parent-child relationship which may heighten emotional and behavioral problems in children. For those laid off from work, their ability to provide for the needs of their children was affected and was associated with depressive symptoms, stress, and negative interaction with their children.[19,20] Furthermore, transitioning from the traditional face-to-face learning to online learning has been difficult not only for the educators and students but for the parents as well. Homeschooling requires that parents support and guide their child in the learning process. However, this is challenging for those parents who are working and are unable to cater to such needs.[21]

Aside from parenting stress brought about by balancing work and childcare, families also had to think of ways to protect themselves from the virus. Without an effective treatment available for COVID-19, one of the best things to do to prevent the spread of the virus is through handwashing. People are becoming more conscious about their health, and this is evident in one study wherein the frequency of handwashing during the COVID-19 pandemic has significantly increased compared to the pre-pandemic years as well as the circumstances when hand washing is done.[22] Aside from handwashing, staying at home is the best option to protect health. However, such limitations are associated with negative psychological effects, poor physical activity, disrupted sleeping patterns, and unhealthy eating behaviors.[23,24]

Finances

The COVID 19 pandemic caused a depression in the global and local economy with unprecedented

unemployment.[16] About 32.4% of the participants had at least one family member who stopped working because of COVID-19. Combining unemployment with the stringent government protocols and lockdowns, labor income loss and family business shutdowns being on an all-time high had a direct impact on the financial domain of Filipino households.[25] In economically vulnerable households, having a COVID-19 positive member caused higher levels of stress to the parents and a decrease in optimism.[19] The stress brought by the pandemic-induced financial constraint increased the risk that parents would lose their temper and yell at their children. This may indirectly cause the children to be behaviorally non-compliant thereby provoking more conflict in the household environment.[19] The challenge of a loss or decrease in family income was heavily manifested by the lack of food security which was worsened by community quarantine and lockdown protocols. Household food insecurity increased conflicts in the household. The scarcity and low quality of food may cause the breadwinner to develop stress, anxiety and depression.[26] In a pandemic, the priority for the budget is directed to the food supply with little to no allocation for personal hygiene, home maintenance, and vices. The sudden loss of financial support for these items may cause a sudden change in the usual activity and routine of members. The unprecedented nature of these losses may potentially disrupt the family dynamic and perpetrate conflict. Future studies can look further into the contribution of these items to the increase in conflict in household environments during a crisis.

In addition, the data analysis shows that the pandemic-induced financial turmoil may cause the general decrease in togetherness in the household environment. This imposed risks on the different types of familial relationships breaching the cohesion in the household environment under the domain of sharing material resources. Financial stress is known to cause a compromise in a breadwinner's mental health care, which is strongly exhibited by mothers in low-income households.[27] In addition, crises such as pandemics may aggravate pre-existing marital problems or create new ones due to the stress of losing a source of income.[28] Adverse family situations such as financial stress may cause poor sibling relationships from elevated aggression and poor anger management.[29] In addition, for the demographics where there are appointed caregivers in the family, there is evidence that the economic constraint brings distress to the caregiver.[30]

Communication and mutuality

Effective communication is necessary to form a harmonious relationships among family members and is crucial in fostering interpersonal commitment and trust.[31,32] It is undeniable, however, that the various changes brought about by the pandemic have led to potential changes in familial interaction. The reported findings denote an increased conflict in "decisions about health", "news or social media", and "politics", whereas neutral responses were noted for "decisions about going out", "decisions about visitors", and "privacy or personal space". Data from the opposite subscale, on the other hand, revealed a general increase in togetherness with respect to "facing challenges together", "helping each other", "sharing household tasks'', and "showing concern or support" while there was no change in "engaging in conversation", "eating together", "showing affection", "sharing material resources", and "helping others together".

In the advent of this pandemic, there is a collision of family, work, and survival demands leading to changes in relational interdependence.[33] Recent studies have cited the occurrence of relational disruptions and uncertainties amid the ambiguities of the COVID-19 pandemic.[34,35] One study revealed that increased time spent together during the lockdown increased the likelihood of partner interference which subsequently caused individuals to view their relationships as turbulent.[36] Such experiences have the potential to bring about negative emotional and cognitive experiences which would inevitably affect how families communicate their frustrations, needs, and worries.[37]

It is interesting to note that responses in majority of the items leaned towards generally positive and neutral responses in terms of communication and mutuality despite numerous factors that have the potential to generate conflict. It can be surmised that the opportunities presented by the pandemic for families to spend time and overcome challenges together sets forth a household situation conducive for the creation of closer relationships.[2]

Religion and spirituality

The effects of the COVID-19 pandemic seem to aggravate mental health issues such as anxiety and

fear.[38] Strengthening religious and spiritual beliefs may reduce the negative effects of prolonged lockdowns. The findings suggest that the effect of the pandemic did not change togetherness in relation to "sharing religious/spiritual activities" under the religion and spirituality domain. Filipinos are known for their strong religious faith and even in the middle of a pandemic, their faith remains steadfast.[38] Even during a pandemic, Christian Filipino families found ways to practice their faith by adapting to and utilizing other means to express their spirituality such as attending online masses and church services conducted via the different social media platforms, reading daily devotionals which can easily be downloaded through mobile devices, and praying together as a family, now more than ever, especially for COVID-stricken families. These only imply that with or without the pandemic, the Filipino faith has proven to be consistent in transcending limitations and spiritual challenges to make sure that their religion and spirituality are always recognized and practiced in whatever circumstance they are in. These, in effect, give meaning, purpose, and constitute overall supportive family relationships.

Recreation

The COVID-19 pandemic necessitated guidelines and restrictions on daily and recreational activities alike. The opportunity to engage in recreational activities has been limited since the beginning of the series of lockdowns in March 2020. The limitations created opportunities to produce new ways of engaging in recreational activities while still observing the safety protocols and guidelines. For the conflict subscale, the change in recreation was measured through the items "spending leisure time together," "decisions about going out," "decisions about visitors," and "news and social media." Results show that there were no significant changes in the items except "news and social media" which had an increase in conflict. On the other hand, there was no significant change in any of the items in the recreation domain under the togetherness subscale.

Many families were quarantined together in one household, so they had more opportunity to share meals together. A previous study has found that more importance is now put on family involvement during mealtimes compared to ease of preparation.[39] The pandemic also highlighted the importance of

a healthy lifestyle and physical well-being. Despite the work-from-home and distance learning set-up, students, as well as parents, were encouraged to still engage in physical activity.[40] Despite the guidelines and restrictions, families have been able to maintain activities they would do together pre-pandemic. Conversely, the shift of most activities to being virtual has resulted in increased screen time, which not only caused eye strain and fatigue but may further decrease physical activity of a family.[34] Prolonged hours of social media use have been associated with feelings of loneliness and stress, which can potentially cause conflict within a family.[41]

Spending time together as a family has its advantages and disadvantages. The shift to a work-from-home setting allows parents more time with their children to do more activities together. Stressors associated with quarantine, isolation, and the pandemic can negatively affect parents' mental health and their capabilities to take care and support their families. A parent's own fears and anxieties can affect a child's mental health, which may bring about conflict and disruption of family dynamics.[42] Conflict may also stem from different situations such as making decisions about going out and accepting visitors. When deciding, families consider the risk for exposure to COVID-19. Families consider the time spent in a certain place, the distance they are from potential sources of the virus, and the concentration of the virus in an area.[43]

Family meals

With the imposed lockdown restrictions, families spent more time together within confined spaces most especially among COVID-stricken families who could not afford to provide themselves with ideal isolation environments and were forced to stay together within the available confined space. The findings suggest that there was no change in togetherness in relation to "eating together" under the family meals domain. Family mealtimes seem to provide a means for members of the family to stay intact amidst the pandemic as this is an opportunity for members of the family to check in with one another while enjoying each other's company. Additionally, household activities such as family meals contribute to maintaining the same feeling of normalcy. During these times, members of the family can adapt to the

feeling of connectedness, unity, and security.[28] On the other hand, maintaining the routine of family mealtimes especially in COVID-19-stricken families was difficult.

Conclusion

The findings reveal a general increase in household conflict and a non-significant change in togetherness among the surveyed families. Discussion of possible factors is made regarding the findings derived from all survey items which were classified into the relational domains of parenting, work-family balance, caregiving, finances, communication and mutuality, religion and spirituality, recreation, and family meals. The composite median values imply the existence of more conflict and less togetherness in terms of the activities described under both Conflict and Togetherness Subscales.

Limitations, implications, and areas for future research

The findings of this study may serve as a guide in assessing the influence of the COVID-19 pandemic on the family household environment. However, this research is largely descriptive and utilizes a cross-sectional design, and hence, will not be useful for hypothesis testing due to confounding variables that may not be accurately measured and accounted for. A limitation of this study is the inherent implication of confounding factors such as socio-economic distinction among participants, recency of diagnosis, and difference in symptom severity. The socioeconomic standing of the participants may have been a significant factor affecting the levels of stress among families, and thus, a substantial distinction in terms of socioeconomic standing may affect the consistency of results. On the other hand, the recency of diagnosis could have predisposed some families to higher levels of stress given the assumption that the more recent stressful events are, the more likely they are to be recalled and elicit negative emotions. The participants were advised that they had the freedom to withdraw should any such situations arise. A difference in the severity of symptomatology among participants may have also brought about a disparity in terms of the overall impact of the disease. The presence of these factors in the study might have resulted in less favorable responses. Due to practical constraints, however, the participants were recruited through both snowball and convenience sampling which made it difficult to control these confounders.

Finally, this paper only captures a descriptive overview of the results gathered from the utilized questionnaire and may not be able to provide an in-depth understanding of how families come to understand and act on their current situation in the context of the COVID-19 pandemic. Nevertheless, the research findings have the potential to serve as a relevant springboard for future researchers who would decide to pursue studies examining similar or closely-related variables.

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COVID-19 Vaccination: The Greater Manila Experience 2021

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Abstract

Introduction Almost half of adult Filipinos were unwilling to receive the COVID-19 vaccination in early 2021. This study aimed to describe the COVID-19 vaccination experience in the Greater Manila Area.
Methods An analytical cross-sectional study design was done where Filipinos aged 18-60 years old residing in the Greater Manila Area answered an online survey. Fisher's exact test was used to compute p-values for the association between participants' willingness or refusal to get vaccinated and their sociodemographic and clinical characteristics.
Results Among 1,248 respondents, 97.92% were willing to get vaccinated against COVID-19. The majority who refused strongly agreed that the vaccine could cause serious side effects (46.2%). Being a college graduate (OR = 3.03, p = 0.006) and high income (OR = 5.06, p = 0.003) had a statistically significant positive association with willingness to get vaccinated.
Conclusion There are more individuals willing to get vaccinated and there is a statistically significant association between educational attainment and monthly income with vaccine willingness or refusal.

Key words: COVID-19 vaccination, vaccine refusal, vaccine willingness

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The World Health Organization declared COVID-19 a pandemic on March 11, 2020.[1] To protect the public from severe disease, the WHO promoted the use of COVID-19 vaccines worldwide. Vaccine confidence became an issue in the Philippines when it dropped between 2015-2018, triggered by the Dengvaxia scare.[2] Poor immunization coverage led to vaccine-preventable outbreaks of measles and polio in 2019.[3] OCTA Research reported that almost half of the adult Filipino population in January-February 2021 were not willing to receive the COVID-19 vaccine due to safety concerns.[4] In March 2021, healthcare

workers also refused and protested about inoculation of a specific COVID-19 vaccine due to concerns on its efficacy compared to other vaccines.[5]

The Philippine government's target to achieve herd immunity was to have 90% of the country's over 105 million population vaccinated due to the spread of the delta variant.[6] Willingness to receive the vaccine became a factor in achieving the government's vaccination target. To increase rates of vaccination, the Department of Health initiated "ResBakuna", a campaign to combat misinformation and to reach and encourage more Filipinos to get fully vaccinated against COVID-19.[7] With the current status of the vaccination program and the numerous factors affecting the people's willingness or refusal to receive the COVID-19 vaccine, a more in-depth understanding of their reasons for willingness or refusal to receive the COVID-19 vaccine is necessary to combat this pandemic and achieve herd immunity.[4]

This study aimed to describe the COVID-19 vaccination experience in the Greater Manila Area. This was done by identifying the sociodemographic and clinical characteristics of Filipinos aged 18-60 years old residing in the Greater Manila Area (Metro Manila, Bulacan, Cavite, Laguna and Rizal) in 2021, determining the proportion who were willing or who refused to get vaccinated, identifying the reasons for willingness and for refusal to be vaccinated, describing the knowledge of COVID-19 vaccination, and determining the association between sociodemographic and clinical characteristics, and willingness or refusal to get vaccinated against COVID-19.

Methods

Using an analytical cross-sectional study design, Filipinos aged 18-60 years old living in the Greater Manila Area were surveyed online on their position regarding COVID-19 vaccination between August and September 2021. The study focused on sociodemographic and clinical characteristics as the independent variable and the respondent's willingness or refusal to get vaccinated against COVID-19 as the dependent variable. Researchers used online methods such as Facebook and Instagram as supplementary tools to recruit the participants from different cities and provinces within the Greater Manila Area. An online platform (Google Forms) was utilized to make the questionnaire convenient and accessible

for all participants. This study was approved by the UERMMMCI Research Institute for Health Sciences Ethics Review Committee. A sample size of 361 was computed by using a sample size calculation module (OpenEpi) with an assumed 62.5% anticipated percent frequency and a 95% confidence level. Filipinos aged 18-60 years old, residing in the Greater Manila Area, with a device that could connect to the internet and had access to the internet were recruited using convenience sampling.

Willingness to get vaccinated against COVID-19 was defined as participants who had received the vaccine regardless of whether it was their first or second dose and/or those "willing" to get the vaccine but were currently waiting for a slot for vaccination. Refusal to get vaccinated against COVID-19 was defined as participants who did not intend to get any dose of the vaccine, even if they were eligible to get vaccinated.

Eligible participants were provided access to a validated four-part questionnaire via a link and QR code provided in the publication materials posted on social media. The questionnaire was adapted from an Indian study published in English.[8] Considering the target population of this research, the authors modified the questions which were then translated to Filipino with certification granted by the Komisyon sa Wikang Filipino. Participants were initially asked their sociodemographic and clinical characteristics in Section A of the questionnaire before proceeding to Section B which was on vaccine acceptance, willingness, or refusal. Knowledge of COVID-19 vaccination was elicited in Section C.

IBM SPSS® (Statistical Package for the Social Sciences) version 25.0 and MedCalc® were utilized for statistical analysis. Descriptive statistics were used and the data for the sociodemographic and clinical characteristics (sex, highest educational attainment, monthly income, presence of chronic conditions and history of COVID-19 infection in the family) along with those for questions regarding vaccine willingness, refusal and knowledge were presented in both frequencies and percentages. Fisher's exact test was used to compute the significance of the association between the willingness to get vaccinated and the multiple sociodemographic and clinical characteristics. The relative risk (RR) and 95% confidence intervals were also computed. A two-tailed p-value of < 0.05 was used as the significance threshold in all statistical tests.

Results

A total of 1,248 complete survey responses were received. The sample had a predominance of females (76.1%), college graduates (71.6%), those with a monthly income of PHP 10,000.00 or less (60.8%), absence of comorbidities (74.7%), and a family history of COVID-19 (82.5%) as shown in Table 1. Four out of five of the 98% willing to get vaccinated had already received at least one dose.

As shown in Table 2, the 4 to 5 out of 10 participants willing to get vaccinated strongly agreed that the COVID-19 vaccines/getting vaccinated: caused no harm (43.4%); provided protection against COVID-19 infection (48.3%); were available without cost (55.3%); recommended by healthcare professionals/doctors (36.6%); outweighed the risk of harm (47.5%); was a social responsibility (47.9%); would help in eradicating COVID-19 infection (46.3%); and, were already taken by the participants' role models/political leaders/senior doctors/scientists (36.9%). Other reasons such as work-related or travel purposes, peer/societal pressures, avoidance of severe infection, living with a healthcare worker/senior citizens and avoidance of hospital admission and expenses were reported as the most common reasons for the participants to get the vaccine.

Table 1. Sociodemographic and clinical characteristics of survey respondents aged 18-60 years old residing in Greater Manila Area.

		n (%)
Sex	Female	950 (76.1)
	Male	298 (23.9)
Educational attainment	College	894 (71.6)
	High school	354 (28.4)
Monthly income	≤ PHP10,000.00	759 (60.8)
	≥ PHP10,000.00	489 (39.2)
Comorbidities	Without	932 (74.7)
	With	316 (25.3)
Family history of COVID-19	Without	1029 (82.5)
	With	219 (17.5)

Table 2. Frequency distribution of reasons for willingness to get vaccinated against COVID-19 among survey respondents.

	Frequency of responses by participants [(n (%)]			
	Strongly disagree	Disagree	Agree	Strongly agree
I think there is no harm in taking COVID-19 vaccine.	206 (16.9)	72 (5.9)	414 (33.9)	530 (43.4)
I believe COVID-19 vaccine will be useful in protecting me from the COVID-19 infection.	210 (17.2)	53 (4.3)	369 (30.2)	590 (48.3)
COVID-19 vaccine is available free of cost.	212 (17.3)	48 (3.9)	311 (25.5)	651 (55.3)
My healthcare professional/ doctor has recommended me.	196 (16.0)	165 (13.5)	414 (33.9)	447 (36.6)
I feel the benefits of taking the COVID-19 vaccine outweighs the risks involved.	200 (16.4)	73 (6.0)	369 (30.2)	580 (47.5)
I believe that taking the COVID-19 vaccine is a societal responsibility.	205 (16.8)	83 (6.8)	349 (28.6)	585 (47.9)
There is sufficient data regarding the vaccine's safety and efficacy released by the government	194 (15.9)	150 (23.6)	454 (37.2)	424 (34.7)
Many people are taking the COVID-19 vaccine.	196 (16.0)	124 (10.1)	475 (38.9)	427 (34.9)
I think it will help in eradicating COVID-19 infection.	209 (17.1)	72 (5.9)	375 (30.7)	566 (46.3)
My role models/ political/ leaders/ senior doctors/ scientists have taken COVID-19 vaccine.	212 (17.3)	139 (11.4)	420 (34.4)	451 (36.9)
Other reasons for getting the COVID-19 vaccine	• Work-related or travel purposes • Peer/ family/ societal pressure • Avoiding severe sequelae of the virus infection • He/ she is living with a healthcare worker or with senior citizens • Avoidance of hospital admission or hospital-related expenses			

Participants who refused to be vaccinated strongly agreed that the vaccine might cause immediate serious side effects (46.2%) and/or unforeseen side effects in the future (34.6%). They also strongly disagreed that vaccines might not be easily available to them (42.3%). The majority also disagreed that the vaccines were being promoted for the commercial gains of the pharmaceutical companies. A third of respondents (34.6%) agreed that COVID-19 vaccines might be faulty or fake. Other reasons for the refusal to get vaccinated were pregnancy/breastfeeding, strong immune system, not going out of the house and

presence of comorbidities and/or allergies as seen in Table 3.

More than half (54.2%) answered correctly when asked if there was a legal mandate to take the COVID-19 vaccine. At least 50% of the respondents were able to correctly categorize 4 out of 8 groups of people as to their eligibility to get vaccinated. Half of the respondents incorrectly categorized children and adolescents < 18 years of age as eligible to receive the COVID-19 vaccine at the time the survey was conducted. These findings are shown in Table 4. More than 80% of participants answered correctly

Table 3. Frequency distribution of reasons for refusal to get vaccinated against COVID-19 among survey respondents.

	Frequency of responses by participants [(n (%)]			
	Strongly disagree	Disagree	Agree	Strongly agree
COVID-19 vaccine might not be easily available to me	11 (42.3)	3 (11.5)	9 (34.6)	3 (11.5)
I might have immediate serious side effects after taking COVID-19 vaccine.	5 (19.2)	3 (11.5)	6 (23.1)	12 (46.2)
COVID-19 vaccine may be faulty or fake.	7 (26.9)	4 (15.4)	9 (34.6)	6 (23.1)
COVID-19 vaccine was rapidly developed and approved.	7 (26.9)	7 (26.9)	7 (26.9)	5 (19.2)
I might have some unforeseen future effects of the COVID-19 vaccine.	5 (19.2)	4 (15.4)	8 (30.8)	9 (34.6)
COVID-19 vaccine is being promoted for commercial gains of pharmaceutical companies	5 (19.2)	9 (34.6)	6 (23.1)	6 (23.1)
Other reasons for not getting the COVID-19 vaccine:	• Breastfeeding/Pregnant • Patient believes they have strong immune system • He/she is not going out of the house • Presence of comorbidities and/or allergies			

Table 4. Knowledge of respondents on eligibility for COVID-19 vaccine.

	Frequency (%)		
	Correct	Incorrect	Don't know
Infants < 1 year of age	945 (75.7)	141 (11.3)	162 (13.0)
Children and adolescents < 18 years	503 (40.3)	631 (50.6)	114 (9.1)
Pregnant and lactating mothers	637 (51)	416 (33.3)	195 (15.6)
Patients with chronic diseases like diabetes, hypertension, and heart diseases	838 (67.1)	271 (21.7)	139 (11.1)
Persons having active COVID-19 infection	543 (43.5)	483 (38.7)	222 (17.8)
Persons recovered from COVID-19 infection	1068 (85.6)	90 (7.2)	90 (7.2)
Persons allergic to food items/drugs	581 (46.6)	437 (35)	230 (18.4)
Immunocompromised patients (e.g., AIDS, cancer patient undergoing chemotherapy)	622 (49.8)	359 (28.8)	267 (21.4)

by disagreeing that they do not need to follow preventive measures, such as wearing a mask and social distancing, anymore after getting vaccinated.

Majority of the participants claimed that healthcare providers (67.0%), news from national TV/radio (58.8%), government agencies (53.9%), social media (54.5%), and discussion among friends and family (50.1%) had a very significant effect in influencing their opinion regarding the COVID-19 vaccine as seen in Table 5. The most preferred vaccine was CoronaVac (Sinovac), while the least preferred vaccine was the Bharat BioTech (Table 6). Level of education and income had a significant positive association with willingness to get vaccinated. Those who are willing were three times more likely to be a college graduate (OR = 3.03, p = 0.006), and five times more likely to have an income of more than PHP 10,000 (OR = 5.06, p = 0.003) as seen in Table 7.

Discussion

The study revealed that more people were willing to get vaccinated (97.92%) than those who refused. Among those who were willing, 79.21% had been vaccinated with at least one dose. This contrasted with the results of a survey conducted by Pulse Asia between November 23 to December 2, 2020, which revealed that out of 2,400 responses, 47% refused the vaccine due to safety concerns.[9] The findings of this study may reflect a change in attitude among the people.[10]

Most of the reasons that were attributed towards the COVID-19 vaccines were heavily influenced by the participants' perceptions about the safety, effectiveness, and the availability of the vaccines. Awareness may also have affected the decision to be vaccinated. The lack of sufficient credible information drove people to question the benefits of the vaccine.[11] Personal beliefs such as the possibility of immediate and serious

Table 5. Impact of sources of information that influenced that participant's willingness or refusal to take the COVID-19 vaccine.

	Responses of participants (n (%))		
	Insignificant effect	Somewhat significant effect	Very significant effect
6.1 News from National TV/Radio	149 (11.9)	365 (29.2)	734 (58.8)
6.2 Government agencies	166 (13.3)	409 (32.8)	673 (53.9)
6.3 Social media (Facebook, Instagram, Twitter, Viber, WhatsApp, and/or others)	164 (13.1)	404 (32.4)	688 (54.5)
6.4 Discussion among friends and family	158 (12.7)	465 (37.3)	625 (50.1)
6.5 Healthcare provider	118 (9.5)	294 (23.6)	836 (67.0)
6.6 If there is any other source of information: Please specify: _____	• Most common: • Research/Clinical article • Billboards • Magazines		

Table 6. Frequency distribution of vaccine preference among survey respondents.

	Frequency
Pfizer-BioNTech	353
Oxford-AstraZeneca	368
CoronaVac (Sinovac)	612
Gamaleya Sputnik V	64
Johnson & Johnson/ Janssen	225
Bharat BioTech	35
Moderna	256
Novavax	49

Table 7. Association between sociodemographic and clinical characteristics with willingness or refusal to get vaccinated among survey respondents.

Characteristic	Willing	Refused	OR (95% CI)	p-value
Gender				
Male	293	5	1.33	0.816
Female	929	21	(0.50, 3.25)	
Education				
College	882	12	3.03	0.007
High school	340	14	(1.39, 6.58)	
Income (PHP)				
≥ 10,000	486	3	5.06	0.004
≤ 10,000	736	23	(1.51, 16.09)	
Comorbidities				
With	312	4	1.89	0.361
Without	910	22	(0.70, 5.11)	
Family history of COVID-19				
With	218	1	5.43	0.069
Without	1004	25	(0.73, 56.39)	

effects negatively influenced the willingness to get the COVID-19 vaccine.

In contrast, most participants who were willing to accept the vaccines agreed that these vaccines could protect them from the possible effects of COVID-19. Participants also believed that it was their social responsibility to be vaccinated not just to protect themselves but also the vulnerable people surrounding them. Travel needs also influenced the attitude of participants to get the vaccine after the opening of many countries to fully vaccinated individuals.[12] Also, businesses were slowly starting to open which likely encouraged people to get vaccinated. This is due to the prerogative of the private sector to mandate the vaccination of all employees to protect not just themselves but also to protect their clients/costumers.[13] Role models, political leaders and health care workers were able to encourage people to participate in the vaccination program for COVID-19. Enhancing public trust through the examples of authorities in high positions in advocating the benefits and effectiveness of the COVID-19 vaccines is critical in enhancing the trust of the public.[14] This is because the government and those people with great influence over the public can effectively communicate the principles and benefits of vaccination. The enhanced, coherent and proactive releasing of information regarding vaccination strategies likely influence, and eventually encourage the public to take the initiative to be vaccinated.

Fear about the immediate side effects and the unforeseen effects of the vaccine were the main reasons for refusing the COVID-19 vaccine. Thus, enhancing vaccination campaigns and strategies will not just influence the public to get vaccinated but also to correct the misconceptions that the general public has.[15] The majority of the participants who refused also strongly agreed (34.6%) that the COVID-19 vaccine might be fake or faulty. This may be attributed to reports of vaccine malpractices or that the COVID-19 vaccine is being promoted for commercial gains of the pharmaceutical companies.[16] However, even with the concerns regarding the vaccine itself, many still believed that the benefits of taking COVID-19 vaccine outweighed the risks as evidenced by the responses of 47.5% of participants. Most participants agreed that getting the vaccine would also help eradicate COVID-19, which further supports that participants believed in the effectiveness of the vaccines against COVID-19.

The knowledge of the participants regarding the COVID-19 vaccination was assessed by the researchers. Based on the results, most of the participants correctly answered that receiving COVID-19 vaccine is not legally mandated by the Philippine government. This

is supported by the Department of Health (DOH) wherein they stated that vaccination is not mandatory, but it is highly encouraged by the government to be protected against vaccine-preventable diseases.[17] Majority of the participants believed that certain groups of people such as children and adolescents < 18 years of age; adults greater than or equal to 18 years of age; pregnant and lactating mothers; patients with chronic diseases like diabetes, hypertension, and heart diseases; people recovered from COVID-19 infection; persons allergic to food items/drug; and immunocompromised patients are eligible to receive the COVID-19 vaccine while infants < 1 year of age and persons having active COVID-19 infection are not eligible to get vaccinated. The majority had categorized the groups of people correctly except for the group of children and adolescents < 18 years of age wherein most of the participants answered that they are eligible to receive the COVID-19 vaccine, which was incorrect. The latter finding is because during the time of the roll out of the survey, children and adolescents < 18 years of age were not eligible to receive the COVID-19 vaccine. Recently, the DOH recommended that adolescents 12-17 years old be vaccinated against COVID-19. Likewise, pregnancy has never been a contraindication against COVID-19 vaccination; the Philippine Obstetrical and Gynecological Society (POGS) has recommended that pregnant women be vaccinated.[18] The vaccination guidelines and practices of the DOH may have contributed to the respondents' knowledge regarding COVID-19 vaccination. Overall, 87% of the participants correctly answered that they still needed to follow preventive measures such as wearing a mask, sanitation, and social distancing even after getting vaccinated. This means that proper hygiene campaigns of the DOH may be effective.

The researchers also asked the participants what brand of vaccine they were given or were willing to receive. The vaccine that garnered the highest number of "yes" responses was CoronaVac (Sinovac). As of October 10, 2021, 21.04% of the total Philippine population had been fully vaccinated and many had received Sinovac.[19] Dissemination of valid and reliable information is very crucial especially during this pandemic. Many of the participants claimed that sources of information such as national TV/radio news, government agencies, social media, discussion among friends and family, and healthcare providers had a significant influence on their opinions (i.e., their willingness or refusal) regarding COVID-19

vaccination. This finding emphasizes the importance of getting information from reliable sources only and the need for public health communication strategies to avoid false information.

Finally, the analysis revealed that there is a statistically significant association between educational attainment and monthly income with vaccine willingness or refusal. College graduates and Filipinos with a monthly income above PHP 10,000 showed greater willingness as compared to their counterparts (i.e., high school graduates and monthly income of PHP 10,000 or less, respectively). A global survey and a similar study in Japan reported parallel results wherein people from low-income levels were less likely willing to get vaccinated.[20,21] In terms of chronic conditions, those with comorbidities were more likely to get vaccinated, and this could be partially attributed to the fact that Filipinos with comorbidities are categorized under the A3 priority group as per DOH's COVID-19 Vaccine Prioritization Framework.[22] Lastly, the researchers found out that those with a positive family history of COVID-19 were more likely to be vaccinated. The CDC urges the public to get their vaccine shots despite having a previous COVID-19 infection as vaccination still offers a higher degree of protection.[23]

The findings of the study reveal that there are more individuals willing to get vaccinated due to the vaccines' safety. In general, more than the majority were able to correctly answer items on the autonomy of people to take the vaccine, knowing who the eligible individuals are, and the need to follow preventive measures after getting vaccinated. The findings of the study also revealed a significant statistical association between educational attainment and monthly income with vaccine willingness or refusal.

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Moderating effect of the impact of COVID-19 on the relationship of stigma and depression: A public mental health concern

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Abstract

Introduction The COVID-19 pandemic has led to rising depression rates worldwide. In the Philippines, people with mental disease are highly stigmatized. Students are one of the most vulnerable populations for depression and stigmatization. This study examines the relationship between the effect of the pandemic and depression rate as well as the role of self-stigma among students.

Methods A correlational research design was utilized using the online-platform Questback. College students were recruited and answered a questionnaire assessing their depression level, self-stigma towards depression using the Depression Anxiety and Stress Scale and Self-Stigma of Depression Scale, respectively, and how negatively they were affected by the pandemic. Multiple and hierarchal linear regression analyses were done to determine the relationship between impact of the pandemic and self-stigma on depression.

Results Of 349 respondents included in the analysis, 60% had moderate to extremely severe depression. Pandemic impact (ß = 0.40) and self-stigma of depression (ß = 0.32) were both positively associated with depression. A moderating effect of Social Inadequacy, a dimension of self-stigma of depression was found. The effect of pandemic impact on depression was stronger on students with higher levels of social inadequacy.

Conclusion Students who are less likely to feel socially inadequate when having depression seem to be more resilient against developing depression when coping with distress brought about by the pandemic.

Key words: COVID-19, depression, stigma

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The COVID-19 pandemic brought the world into a state of shock with rising numbers of fatalities and fears of contracting the dangerous disease. The pandemic impacted life on many different levels, leading to economic recession, higher unemployment, social distancing and isolation. All these factors and general insecurity took a heavy toll on mental wellbeing, resulting in rising psychological distress and mental diseases. Around 6 million Filipinos are estimated to live with depression and/or anxiety, with the country ranking third in Asia.[1]

Mental health problems like depression have been on the rise in the Philippines even before the onset of the pandemic. In 2017, the WHO reported a

prevalence of 3.3 %.[1] This may be an underestimation since data on mental health in the Philippines is scarce and a national survey from 2013 found a 9% prevalence for moderate to strong depression among young adults below 24 years.[2] Depression was also identified as the 8th largest cause of disability in the country. College students are more vulnerable to develop mental disorders than the general population. A World Mental Health Survey of 21 countries in 2016 found that 20.3% of all college students had a mental disorder based on DSM-IV criteria.[3]

Suicide is considered to be the second most frequent cause of death among students.[4] In the Philippines, the suicide rate rose to 26% in 2020 compared to 2019, with 58% of all cases being below 30 years old.[5] While depression in the Philippines is on the rise, the national health system has not been able to provide adequate treatment and support options. There is a lack of mental health specialists like psychologists and services are mostly concentrated in large urban centers like Manila. The pandemic caused additional burdens for the provision of mental health services as face-to-face sessions had to be cancelled and economic hardship prevented many people from seeking professional help.[6] The rising burden of mental illness also challenged the existing system of mental health services, which has been pushed to the limit already before the COVID-19 pandemic. The evolution of the pandemic has become a greater challenge to public health in combating both medical and mental health needs.

Apart from the challenges of mental health issues in the Philippines, there is also a strong cultural tendency to stigmatize people suffering from depression, anxiety or other mental health conditions.[7,8] In the study, the researchers explore self-stigma where it becomes a subjective and personal definition of one's bias against depression. Stigmatization spreads across cultures and even to the family.[9] A study showed empirical evidence for the belief that stigma towards mental diseases is common in Philippine culture. Stigma can also manifest itself in the form of stereotypes, humor and even through a negative portrayal of people suffering from mental disease by the media.[10] Stigma was found to be a barrier for many Filipinos from seeking professional help.[8] Likewise, apart from the negative impact of suffering from depression, studies also identified a widespread stigmatization towards mental diseases in the Philippines.[7,8] Stigma may be public or self-stigma.[11] Public stigma refers

to the negative attitudes arising from societal judgments while self-stigma can be understood as an internalization of perceived social discrimination and stigmatization.[12] One of the main sources for stigma towards people with mental health problems is the notion that they exhibit behavior that may be harmful to themselves and others.[13] The self-stigma leads to a negative stereotype belief about oneself which evolves into more personal prejudices. The internalization brought by the experience and subjectivity may lead to negative emotional reactions which come with a price: internalized stigma with mental illness causes more harm.[12] This supports the idea that self-stigma increases depression. Additionally, self-stigmatization diminishes feelings of self-worth, leading to poor health outcomes and quality of life.[14] Self-stigma may also lead to low self-esteem and poor self-efficacy.[15] On March 16, 2020, the entire Luzon island was placed under enhanced community quarantine (ECQ).[16] Establishments like businesses, schools and other activities were suspended. COVID-19 infections were constantly rising and ECQ forced people to stay at home.[17] Studies revealed that the uncertainty and fear caused by rising numbers of infections and mortality was also expressed as a significant rise in anxiety, depression, and insomnia.[18,19,20] The implementation of lockdowns also led to boredom, anxiety and isolation. Even though quarantine measures lead to more safety and limited the spread of the virus, long term confinement may have impacted mental health. Sundarasen labeled the COVID-19 virus a killer that gives a prolonged feeling of threat and uncertainty.[21] The threat that anyone can be infected, even with safety protocols being implemented, highlights the risk. The uncertainty of how the pandemic will play out and the anxiety connected with this threat also increased the risk for mental health problems.

The United Nations Educational, Scientific, and Cultural Organization (UNESCO) revealed that the COVID-19 pandemic caused significant disruption in learning. An estimated one billion students in 129 countries could not resume their regular studies. Many students suffered from lack of face to face learning exposure when institutions shifted to online learning systems. Several studies conducted during the earlier lockdowns found increased rates of anxiety, depression and stress among younger individuals (18-35 years) who suffered greatly because of the reorganization of their studies to a work from home set up.[22-24] Schools and universities shifted to online classes and

lectures.[25] Those abrupt changes had a strong negative psychological impact on students and made them more vulnerable to depression.[26,27] In Bangladesh, two thirds of students in higher academic learning experienced mild to moderate depression and anxiety, due to online studies and lockdown measures.[28] Studies in China and Malaysia showed a significant effect on students' psychological well-being, with a high level of anxiety caused by lockdowns.[21,29] Students who experienced hard lockdowns were more vulnerable to depression, affecting their daily functioning and social relationships. The challenges to navigate modules, online platforms, connection issues were among their concerns. The more inconvenience they felt about this new normal, the more susceptible they became to develop depression.

The present research study was anchored in the two theoretical models: the Beck Depression Model and the Stigma Model.[13,30] According to Beck, a person experiencing depression also generates negative thoughts. The stronger the depressive episode, the more dominant negative automatic thinking processes become, later impairing a person's ability to think logically. The way a person perceives his world and other people may become more pessimistic and lead to depressive symptoms. A thought thus has the power to affect emotion, which can lead to emotional instability. The more negative thoughts one experiences, the more depressed one becomes. Beck emphasizes that negative thoughts are influenced by how a person processes and interprets events around him. These dysfunctional belief systems can be understood as schemas which are embedded in one's psyche. The more the person experiences negative thinking the greater the depressive episode. Therefore, if a person perceives the pandemic negatively, this perception may lead to depression.

A person may be aware that he has a condition or characteristic which is judged as undesirable by society or significant others. According to the self-stigma model by Corrigan & Rao, if the person applies the stigma to him/herself and internally agrees with the negative public stereotype, he/she is experiencing self-stigma.[13] This may lead to harm and to a significant decrease in self-esteem and self-efficacy. The negative internal thinking process that may lead to depression, as described in Beck's depression model, may be enhanced by experiencing stigma.[30] A recent study found that discrimination towards people suffering from mental diseases is widespread in the Philippines and is associated with strong adverse effects for the persons concerned.[7] Furthermore, mental health problems are commonly considered as family problems which may result in shame for the whole family, thus increasing the pressure on a person with mental health problems even further. Stigma is closely associated with depression.[31] Both variables are associated with symptoms like feeling depressed, guilt, self-blame and low self-esteem.[32] Apart from the directly affected individuals, stigma also affects those socially close to them, who become more vulnerable to depression and other mental illnesses as well. Previous studies found an association between stigma and depression. Both variables are associated with symptoms like feeling depressed, guilt, self-blame and low self-esteem.[32] Aside from the given association between the variables, the impact of COVID-19 pandemic and those who experienced COVID-19 or know someone who did will also experience the stigma and become vulnerable to depression and other mental illness. Using the linear moderation model, this study aimed to establish the interaction on the different path models using the three variables. The study also looked at the general impact of this in the public health perspective. The present study thus examined the relationship between the effect of the pandemic and depression rates among Filipino college students and the role of self-stigma in this context. Given the disruption caused by the pandemic and its major adjustment challenges for students, it can be expected that this is also connected to a strong increase of mental illness within the student population and constitutes a general public health concern.

Methods

This was a correlational study which determined the relationship of the impact of the pandemic with depression and self-stigma. It utilized the Depression Anxiety Stress Scale, Self-Stigma of Depression Scale and a question on the impact of the pandemic through an online survey using Questback. G*Power was used to calculate the sample size for multiple linear regression with four predictors to test the hypothesis with a mean small effect of $f^2 = 0.085$, a power of $1-\beta = 0.95$ and an error probability of $\alpha = 0.05$. The computed sample size was 254 respondents.

The Depression Anxiety Stress Scale (DASS-21) was used to measure psychological distress within the previous week and consists of three subscales:

Depression, Anxiety and Stress.[33] It consists of 21 items with a four-level Likert scale in a self-reported answer format: 0 - "did not apply to me at all" until 3 - "applied to me very much, or most of the time". The instrument allowed the interpretation of the full scale, as well as the interpretation of the subscales individually. Depression, the relevant subscale for this research, assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest/ involvement, anhedonia, and inertia. Seven of the 21 items are assigned to one of the three subscales. Depression is measured with items 3, 5, 10, 13, 16, 17, 21. The item scores are added and multiplied by 2 for the subscale or full scale score. The range of the scores for interpreting the severity of depression are: normal (0-9), mild (10-12), moderate (13-20), severe (21-27) and extremely severe (28-42). Psychometric data for the DASS-21 scale were reported to be reliable and valid.

The Self-Stigma of Depression Scale (SSDS) assesses the extent to which people hold stigmatizing attitudes towards themselves in relation to having depression.[34] It consists of a 16-item scale with four subscales: Shame, Self-Blame, Social Inadequacy, and Help-Seeking Inhibition. Responses are measured on a five-point Likert scale, ranging from 1 "strongly agree" to 5 "strongly disagree". Items are coded so that a higher score indicates greater self-stigma. The scale was validated with student samples and had good psychometric properties. Items 1-4 are for Shame, 5-8 for Self-Blame, 9-12 for Social Inadequacy and 13-16 for Help-Seeking Inhibition. The score for each participant in the total scale and subscales is the accumulated score of all items. A higher score indicates a stronger self-stigmatization towards depression in general and for the different dimensions of self-stigma, separately.

Participants were asked to rate to what degree the current COVID-19 pandemic negatively affected their personal life using a five-point Likert scale ranging from 1 - "not at all" to 5 - "extremely". The item allowed a graded measurement of pandemic impact which was related to the variables depression level and self-stigma.

Using non-random sampling, the participants were recruited through various social media platforms, including several Facebook groups and channels where the researchers posted information about the study. The information posted included direct links to the informed consent form and the online questionnaire.

The items of each measurement were encoded in the online survey platform Questback to create a questionnaire.

SPSS version 20 was used for all analyses, including descriptive statistics and moderation regression analysis. Descriptive data included the demographics and the different scores generated from the responses of the participants including percentages, means and standard deviations. Multiple hierarchical regression analyses were done to determine the influence of the impact of the pandemic and self-stigma on depression. For a more differentiated understanding of the influence of self-stigma, the four SSDS subscales were included as independent variables as well. In order to guarantee robust estimates, all regression analyses used the bootstrapping procedure with 5000 samples.[37]

Results

Five hundred five respondents completed the informed consent and finished the online survey. During data cleaning, 156 datasets were excluded for missing values in the variables "seriousness of participation", "agreement on data usage" and "processing time". Respondents with a processing time of more than three times of the interquartile range were excluded, leaving 349 respondents from 17 private universities in Metro Manila in the analysis. There were more females (77.7 %); the mean age was 20.5 ± 3.44 years. Four of ten respondents were psychology majors (42.2%) while the rest were nursing or allied health sciences students as shown in Table 1.

Table 1. Demographic characteristics of participants (N = 349).

Characteristics	n (%)
Gender	
Male	78 (23.4)
Female	271 (77.6)
Age (years)	
18	50 (14.3)
19	37 (10.6)
20	175 (50.2)
21	87 (24.9)
Course	
Allied health	81 (23.2)
Nursing	120 (34.4)
Psychology	148 (42.4)

The mean depression score in the DASS-21 subscale was 16.47 ± 9.87 which fell in the moderate range. As seen in Table 2, 30% of respondents were in the moderate category and another 30% were in the severe and extremely severe groups. More than half of respondents said that the impact of the pandemic was at least strong, as seen in Table 3. The mean SSDS full scale score of the sample was 54 ± 9.79, with the means for the subscales ranging from 10.8 to 15.3, as seen in Table 4.

For an overview of the relation between all relevant variables, a correlation analysis was conducted (See Table 5). The negative impact of the pandemic was positively associated with depression rates and was statistically significant ($r^2 = 0.42$, $p < 0.001$). While pandemic impact was not associated with self-stigmatization towards depression when measured with the SSDS total scale ($r^2 = 0.08$, $p > 0.05$), it was positively associated with the SSDS subscale Social Inadequacy and was statistically significant ($r^2 = 0.21$, $p < 0.001$). Depression was positively associated with all scales of the SSDS apart from the subscale Self-Blame ($r^2 = 0.28$, $p > 0.05$). All measures of self-stigma towards depression were significantly positively associated with each other.

Table 2. DASS-21 Depression subscale frequency scores (N = 349).

Depression category	n (%)
Normal	82 (23.5)
Mild	61 (17.5)
Moderate	105 (30.1)
Severe	44 (12.6)
Extremely severe	57 (16.3)

Table 3. Negative impact of pandemic frequency scores (N = 349).

Degree of impact	n (%)
Not at all	5 (1.4)
Slightly	35 (10.5)
Moderately	105 (30.1)
Strongly	146 (41.8)
Extremely	58 (16.6)

Table 4. Descriptive values for Self-Stigma for Depression (SSDS) total- and subscales.

SSDS component	Mean $\pm$ SD	α
Full scale	54.0 ± 9.79	0.84
Shame	13.0 ± 3.84	0.82
Self-Blame	15.3 ± 2.95	0.65
Social Inadequacy	14.8 ± 3.25	0.78
Help Seeking Inhibition	10.8 ± 3.70	0.77

α – Cronbach's alpha

Results of Hypothesis Testing

H1: There is a positive and independent association of the negative impact of the pandemic and self-stigma towards depression with depression level among students.

Hypothesis 1 assumed that stronger negative impact of the pandemic as well as higher values of self-stigma towards depression both lead to higher depression rates among students, independent of each other. Two hierarchical regression analyses were conducted using the SSDS total scale and the SSDS

Table 5. Means, standard deviations and intercorrelations (r2) for depression, pandemic impact and self-stigma variables.

Variable	M $\pm$ SD	1	2	3	4	5	6	7
1. Negative effect pandemic	3.62 ± 0.93	-	0.42***	0.08	-0.02	0.28	0.21***	0.04
2. DASS21 - Depression	16.47 ± 9.87	-	-	0.35***	0.23*	0.09	0.43***	0.24***
3. SSDS - Total	54.00 ± 9.79	-	-	-	0.83***	0.51***	0.69***	0.78***
4. SSDS – Shame	13.04 ± 3.81	-	-	-	-	0.24***	0.42***	0.59***
5. SSDS - Self-Blame	15.34 ± 2.95	-	-	-	-	-	0.16**	0.16**
6. SSDS - Social Inadequacy	14.76 ± 3.25	-	-	-	-	-	-	0.38***
7. SSDS – Help Seeking Inhibition	10.85 ± 3.70	-	-	-	-	-	-	-

DASS21 = Depression, Anxiety and Stress Scale. SSDS = Self-Stigma of Depression Scale.
N = 349, *p < 0.05, **p < 0.01, ***p < 0.001.

subscales, respectively. Pandemic impact ($\beta = 0.40$, $p < 0.001$) and self-stigma of depression full-scale had a positive influence ($\beta = 0.32$, $p < 0.001$) on the depression level among students in the hierarchical regression model. While pandemic impact explained 17.7% of the variance ($R^2 = 0.177$, $p < 0.001$) in depression, the inclusion of self-stigma into the model resulted in an additional 10% of variance ($R^2 = 0.277$, $p < 0.001$). The additional hierarchical regression analysis with the subscales of the SSDS scale included in the model instead of the total scale resulted in pandemic impact having a slightly lower influence ($\beta = 0.36$, $p < 0.001$ vs $\beta = 0.40$, $p < 0.001$). Only the domain of Social Inadequacy ($\beta = 0.29$, $p < 0.001$) had a statistically significant independent positive influence on the depression level. The inclusion of all four subscales of self-stigma explained 13.3% more variance ($\Delta R = 0.133$, $p < 0.001$) in students' depression than pandemic impact alone, leading to a total of 31.1% explained variance ($R^2 = 0.311$).

H2: Self-stigma towards depression moderates the relationship between perceived impact of the COVID-19 pandemic and depression rates among students. A higher level of self-stigma increases the positive association between pandemic impact and depression.

To determine whether self-stigma towards depression moderated the effect of negative impact of the COVID-19 pandemic on depression, leading to a stronger influence of pandemic impact with higher levels of self-stigma, two moderation analyses were performed using the PROCESS model. In the first analysis, the outcome variable was depression and the predictor variable was the perceived negative impact of the COVID-19 pandemic. The moderator variable evaluated for the first analysis was self-stigma using the full SSDS scale. The interaction between the impact of pandemic and self-stigma towards depression was not statistically significant ($\beta = -0.017$, $p = 0.73$). Self-stigma towards depression, when measured with the SSDS full scale, did not moderate the relationship between pandemic impact and depression. A second moderation analysis was conducted, taking into account the results of the correlation and hierarchical regression analysis that revealed that the SSDS subscale Social Inadequacy was the only independent significant predictor of depression among the four domains of self-stigma.

For this analysis, the subscale Social Inadequacy was the moderator variable. All other variables were the same as in the first analysis. There was a statistically significant interaction between the impact of the pandemic and self-stigma towards depression ($\beta = 0.377$, $p = 0.003$). The conditional effect of Social Inadequacy on depression showed corresponding results. Johnson-Neyman intervals indicated that from a value of 8.70 for social inadequacy, negative impact of pandemic and depression became significantly related, $b = 1.59$, $t(345) = 1.97$, $p = 0.05$. As social inadequacy increased, the association between the negative impact of the pandemic and depression became more positive: at one standard deviation below the mean for Social Inadequacy, b was 2.65 ($t(345) = 4.80$, $p < 0.001$), at the mean b was 3.88 ($t(345) = 8.21$, $p < 0.001$) and at one standard deviation above the mean, b was 5.10 ($t(345) = 7.33$, $p < 0.001$) as shown in Figure 1. These results identify social inadequacy as a positive moderator of the relationship between perception of the negative impact of the COVID-19 pandemic and depression rates among students.
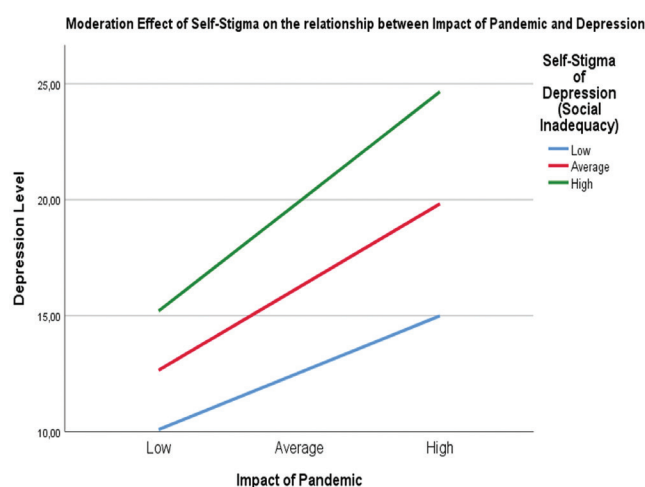
Figure 1. Relationship between pandemic impact and depression level among students for low, mean and high level of social inadequacy.

Discussion

The mean score and proportion of respondents with moderate to extremely severe depression indicate that a significant proportion of students may be suffering from undiagnosed depression. Those findings also correspond with previous global research among undergraduate students that found moderate to high prevalence rates of depression, anxiety and stress in

this population.[38,39] In a study comparing the effects of COVID-19 lockdowns on the mental health of young people in five countries, depression scores were highest in the Philippines with a mean of 18.66 compared with the study sample's mean of 16.47.[40] However, the researchers noted a lower percentage of respondents with extreme severe depression (16.3% vs 26.2%) which might reflect specific properties of the samples.

The self-estimation of how much the pandemic affected the respondent's life revealed that almost all were somehow negatively affected by the pandemic. The majority reported that their life was affected by the pandemic (41.8% strongly and 16.6% extremely). Li found a high level of impact by the pandemic among Filipino students relative to Chinese students.[41]

The results of the regression analysis confirmed the first hypothesis: the more students felt that their life was severely impacted by the pandemic, the higher their depression level was. The depression level was also found to be influenced by self-stigma towards depression. The more students agreed with self-stigmatizing ideas towards depression, the higher their depression level was. While the effect size of pandemic impact on depression alone fell in the medium range, the effect size of pandemic impact and self-stigma combined was large. This shows that while the students' risk of becoming depressed as a result of how severely they feel impacted by the pandemic was already substantial, this risk becomes even higher when they internalize stigmatizing beliefs towards people with depression which means they agree with negative stereotypes about depression.[11]

An unexpected finding in the second regression analysis was that only one of the four domains of the SSDS - Social Inadequacy - explained a unique amount of variance in students' depression. The results of the intercorrelations (Table 4) showed that all subscales of the SSDS were correlated with each other and all except Self-Blame were also correlated with depression. This may indicate that the construct Social Inadequacy contains most of the aspects related to depression that are similarly contained in Shame and Help-Seeking Inhibition and other unique aspects not covered by these domains. An explanation may be that the items measuring social inadequacy are primarily related to the social aspect of self-stigma, unlike the items of the other subscales, and indicate how much a person believes that his or her "value" to other people would be impaired or diminished if they had depression. This aspect of social inadequacy may

be characterized as a form of self-devaluation, which was described as a consequence of the final step in the process of self-stigmatization, where a person applies stereotypes of a stigmatized group to one's self. As a result, the identification with a stigmatized group then often leads to self-blame.[15]

One goal of this study was to explore the role of self-stigma of depression in the relationship between the perceived impact of the COVID-19 pandemic and depression. Research using the SSDS and a similar scale found that higher self-stigma of depression was associated with higher depression rates.[14,34] Taking into account the high vulnerability of students to develop depression in general and especially during the pandemic as well as the strong tendency to stigmatize people with mental diseases in the Philippines, it appeared plausible to assume an enhancing effect of self-stigma in developing depression under distressing conditions like the COVID-19 pandemic. The researchers thus expected a moderating effect of self-stigma on depression with pandemic impact as predictor.

Social Inadequacy was found to be the only domain of self-stigma associated with pandemic impact. This assumption was further supported by the results of the intercorrelations, where Social Inadequacy was the only domain of self-stigma that was associated with pandemic impact. While the overall self-stigma measure of the SSDS did not have any interaction with pandemic impact, the SSDS subscale Social Inadequacy was a highly significant moderator. Depending on the extent students felt socially inadequate for having depression, their perception on how much the pandemic affected their life had a weaker or stronger effect on their depression level during the previous week. This means that students who were less likely to feel inferior in social situations or believed they were of less value to other people when having depression were more protected from developing depression. The higher the level of social inadequacy became the stronger the connection between pandemic impact and depression. Student life is usually characterized by many social interactions. With the COVID-19 pandemic, social distancing, distance learning and lockdowns over a long period of time, opportunities for students to have direct social interactions were substantially reduced. In this context, it is plausible that while the distress of the pandemic alone may trigger depression because of fewer social interactions, students who

feel not to be good company or a burden to others because of feeling depressed, may decide to avoid social interactions even more or altogether. This then could make those students more vulnerable to the stress of the pandemic and lead more easily to depression. Based on the findings of this study, social inadequacy needs to be understood as an important detrimental factor and more specifically as a promoter for developing depression. This also suggests that effective intervention forms to avoid or reduce feelings of social inadequacy may lead to more resilience in a student`s coping process in response to the pandemic.

The study may not have been representative of all the college students enrolled in higher education studying in both public and private institutions in Manila. It needs to be considered that the impact of the pandemic on student life was operationalized in terms of a subjective self-evaluation. Pandemic impact is thus a psychological construct. This study had a cross-sectional design, so causality cannot be inferred from the results. Even though it appears plausible that a negatively perceived pandemic causes depression, it is also plausible that an already existing depression may lead to a more negatively perceived impact of the pandemic. There may well be complex mutual influences between the two variables. It also needs to be recognized that pandemic impact was only assessed with a one-item self-constructed scale. A more differentiated exploration and measure of specific factors of the pandemic that students experienced as very negative for their life would be helpful in identifying risks and a better understanding of how those factors may trigger depression.

There is a need for more research on the factorial structure of the subscales of the SSDS and their content in terms of how they actually represent domains of self-stigma. For example, the original work on the construction of the SSDS does not give a clear explanation of why Social Inadequacy was included in the SSDS. The authors found that the construct social inadequacy plays a major role in the relationship between pandemic impact and depression. The authors offered some plausible interpretation of why this domain of self-stigma functions as a moderator. Due to many uncertainties, this should only be considered as a starting point for further explorations of the importance and nature of this construct. The study showed that self-stigma of depression plays an important role in facilitating depression in the student population studied. The relationship of self-stigma and its domain Social Inadequacy to depression should be explored more for other cohorts, like adults, rural student populations and older people. Since there are only a few scales available that operationalize self-stigma towards mental problems like depression, there is a need for more research into the construct of self-stigma and its different domains. This may be done by pursuing a better understanding of the SSDS and its subscales, as well as working on other possible operationalizations of this important psychological construct. The majority of the sample was female. Therefore, the authors also recommend similar research with more homogeneous samples. Possible covariates as additional factors that may have an influence on depression and self-stigma should also be examined.

One of the most important outcomes of this study is the identification of a form of self-stigma or self-devaluation due to depression as an important risk factor that may worsen the negative impact of the pandemic on the mental health of students. Interventions to improve the mental health of students during this pandemic but also in general should include strategies and measures to identify and reduce feelings of social inadequacy or inferiority. This will help to fight depression more effectively and make students more resilient when coping with the extraordinary stressors of this crisis.

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Declaration of conflict of interest
The authors have no conflict of interest to declare.

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The correlation of population, population density, age, and sex to the number of confirmed cases of COVID-19 among local government units in the National Capital Region

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Abstract

Introduction   The NCR had amassed 752,668 cases of COVID-19 as of September 2021, the highest among the regions in the Philippines. This study aimed to determine the correlation between population, population density, age, and sex with the number of cases among local government units (LGU) in the National Capital Region (NCR).

Methods   The data for population, population density, age, and sex distribution of the LGUs of NCR were retrieved from the 2015 Philippine census while the data for cases were from DOH's COVID-19 Tracker. Pearson correlation coefficient was computed to determine the correlation between population, population density and cases. Phi and Cramer's V statistic were computed to determine associations between sex, age groups, and cases.

Results   There was little or no correlation between population density and number of cases (r = 0.236) but was good (r = 0.905) when Quezon City was excluded for being an outlier. There was good correlation between population and number of cases (r = 964, p < 0.001). There was very weak to no association between sex and number of COVID-19 cases. There was a statistically significant moderate association between age and COVID-19 cases (ϕ = 0.145, p < 0.001).

Conclusion   The study has shown that population density and population have a good correlation with the number of COVID-19 after Quezon City was removed as a data point. There is a moderate association between age and number of COVID-19 cases. There is a very weak to no association between sex and COVID-19 cases.

Key words: COVID-19, population density, correlational study

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Epidemics and pandemics have brought about changes not only in the healthcare system, but also in man's social life, economy, and travel. The latest pandemic that has been wrecking havoc across the world is COVID-19, which came to the attention of the World Health Organization (WHO) on December 31, 2019 when their China office was informed of a group of patients with pneumonia of unknown origin in Wuhan City.[1] At the time of this writing, despite

combined efforts of WHO and involved countries, the virus has spread to 222 countries and territories.[2] In the Philippines alone, 2,385,616 confirmed cases and 36,934 deaths have been recorded.[3] The country was only second to Indonesia with the greatest number of confirmed cases in Southeast Asia. This is despite the Philippines recording 23,210 cases per million, which is close to double compared to Indonesia.[4] The National Capital Region (NCR) had the highest number of cases among the regions, with 752,668 confirmed cases, equivalent to 31.55% of the country's total. This was followed by Region IV-A, found in close proximity to NCR, with 450,008 confirmed cases.[3] In spite of efforts to contain the spread of the virus through lockdowns, cases in NCR showed a slow decline in the number of new cases since mid-August of 2020, followed by a rapid rise in mid-April 2021 and mid-September 2021.[3] As of September 20, 2021, the confirmed cases in the Philippines were 2,385,616 of whom 51.1% were male, the most affected age groups were 25-29 years (15.5%) and 30-34 years (13.3%). As shown in Table 1, Quezon City (QC) had the bulk of the cases in NCR with 151,856 (20.2%) and held the largest increase in new cases from NCR, followed by the City of Manila with 94,032 cases (12.5%), and Caloocan City with 57,833 cases (7.7%). Pateros had

the lowest number of cases (1%).[3] Tables 2 and 3 show the sex and age distribution of the cases, respectively.

There have been several studies correlating the spread of COVID-19 and population density, which is a measure of the number of people living per square kilometer in an area. One such study found that countries with greater population density had higher rates of transmission that may be due to increased contact rates.[5] Furthermore, studies in Algeria and Japan have shown similar results, with increasing population density being implicated in a higher number of confirmed cases of COVID-19.[6] However, this, may not be the case in countries with strict lockdown rules.[7] This is in consideration that population density and COVID-19 case estimates are influenced by factors such as socioeconomic indicators, adherence to social distancing policies, and infrastructures catering to health care services.[8] According to the largest publicly available database on sex-disaggregated data on COVID-19, worldwide, there is no clear trend whether either sex is more likely to be infected with the virus. However, many of the countries report that when it comes to mortality, men are more likely than women to die from COVID-19.[9] A study on the epidemiologic profile of COVID-19 in the Philippines found that slightly over half of

Table 1. Population, population density, and cases of the different LGUs in NCR.

District	City	Population	Population Density (pax/km²)	Cases	Cases per 1000
1	Manila	1,780,148	71,263	94,032	52.82
2	Mandaluyong	386,276	41,580	29,563	76.53
	San Juan	122,180	20,534	14,569	119.24
	Pasig	755,300	15,586	55,020	72.85
	Quezon City	2,936,116	17,099	151,856	51.72
	Marikina	450,741	20,945	23,977	53.19
3	Caloocan	1,583,978	23,387	57,833	36.51
	Malabon	365,525	23,267	21,773	59.57
	Navotas	249,463	27,904	17,209	68.98
	Valenzuela	620,422	13,195	34,313	55.31
4	Las Pinas	588,894	18,014	31,408	53.33
	Muntinlupa	504,509	12,692	26,760	53.04
	Paranaque	665,822	14,297	43,556	65.42
	Pasay	416,522	29,815	35,174	84.45
	Makati	582,602	27,010	53,097	91.14
	Taguig	804,915	17,804	55,165	68.54
	Pateros	63,840	17,804	7,363	115.34
NCR		12,877,253	20,784	752,668	58.48

Table 2. Population, cases, cases per 1000 in females and males per age group in NCR.

Age Groups	Female			Male		
	Population	Cases	Cases/ 1000	Population	Cases	Cases/ 1000
0 to 4	578,262	6,614	11.44	622,181	7,570	12.17
5 to 9	562,817	7,803	13.86	600,902	8,506	14.16
10 to 14	552,556	10,215	18.49	583,036	10,911	18.71
15 to 19	635,585	15,479	24.35	618,218	14,771	23.89
20 to 24	687,833	42,064	61.15	661,172	39,501	59.74
25 to 29	638,532	56,958	89.20	626,570	60,030	95.81
30 to 34	548,788	46,138	84.07	555,830	53,644	96.51
35 to 39	483,275	34,535	71.46	480,592	40,484	84.24
40 to 44	409,369	28,666	70.02	408,420	34,276	83.92
45 to 49	364,570	23,919	65.61	347,683	27,593	79.36
50 to 54	309,071	23,185	75.02	282,371	24,547	86.93
55 to 59	247,539	20,824	84.12	220,867	20,147	91.22
60 to 64	186,953	17,127	91.61	158,211	15,211	96.14
65 to 69	124,534	12,429	99.80	98,704	11,283	114.31
70 to 74	73,271	8,991	122.71	49,693	8,121	163.42
75 to 79	53,010	5,258	99.19	30,692	4,104	133.72
80+	52,923	7,497	141.66	23,223	4,267	183.74

Table 3. Population, cases, cases per 1000 per age group in NCR.

Age Group	Population	Cases	Cases per 1000
0 to 4	14,184	1,200,443	11.82
5 to 9	16,309	1,163,719	14.01
10 to 14	21,126	1,135,592	18.60
15 to 19	30,250	1,253,803	24.13
20 to 24	81,565	1,349,005	60.46
25 to 29	116,988	1,265,102	92.47
30 to 34	99,782	1,104,618	90.33
35 to 39	75,019	963,867	77.83
40 to 44	62,942	817,789	76.97
45 to 49	51,512	712,253	72.32
50 to 54	47,732	591,442	80.70
55 to 59	40,971	468,406	87.47
60 to 64	32,338	345,164	93.69
65 to 69	23,712	223,238	106.22
70 to 74	17,112	122,964	139.16
75 to 79	9,362	83,702	111.85
80+	11,764	76,146	154.49

the cases were men.[10] In the United States, where testing was prioritized for symptomatic individuals, diagnosis rates were similar for men and women although in South Korea, where community testing was mainly practiced, more women tested positive. In both countries, however, men had higher mortality rates.[11] A study linked the higher rates of COVID-19-associated morbidity and mortality of men to a range of biological, psychological, and behavioral factors.[12]

This research aimed to determine the correlation of population, population density, age, and sex with the number of confirmed cases of COVID-19 among the Local Government Units (LGUs) in NCR from January 30, 2020, to September 20, 2021. The study specifically aimed to determine 1) the correlation of population and the number of confirmed cases of COVID-19, 2) the correlation of population density and the number of confirmed cases of COVID-19,

and 3) the relationship of age, sex, and the number of confirmed cases of COVID-19.

Methods

This study employed a correlational design as its objectives were to identify the relationship between COVID-19 cases per age range and sex, population, and population density among LGUs in NCR. The age-sex structure, population, and population density of the 16 cities and 1 municipality in NCR were retrieved from the 2015 census of the Philippines from the Philippine Statistics Authority website. The data for the confirmed cases of COVID-19 per age and sex were retrieved from the DOH COVID-19 Tracker. Population density was computed as the number of individuals or inhabitants occupying an area of 1 km^2 (inhabitants/km^2) per LGU.

Pearson correlation coefficient (r), with the following cut-off values: 0.00-0.25 for little to no correlation, 0.26-0.50 for fair, 0.51-0.75 for moderate to good, and > 0.75 for good to excellent correlation, was used to determine the strength and the nature of relationship between population and population density and the number of COVID-19 cases in each LGU.[13] A Pearson correlation was done to assess the strength and nature of relationship between population density and the number of COVID-19 cases per sex. Using the population and population density data, different statistical analyses were used to determine the correlation of sex and age with number of COVD-19 cases. Phi and Cramer's V were used to test for association between age and COVID-19 cases, and for association between sex and COVID-19 cases with the following cut-off values: > 0.25 for very strong association, > 0.15 for strong, > 0.10 for moderate, > 0.05 for weak, and > 0 for very weak to no association. Additional statistical analysis, specifically Pearson correlation coefficient was used to assess the correlation of population density with sex. A subset analysis was carried out excluding the data from an outlier LGU.

Results

Population density, population and COVID-19 cases

The Pearson correlation for population density was r = 0.236, indicating little or no correlation,

however this was not statistically significant (p = 0.362). The Pearson correlation for population was r = 0.964, indicating a good correlation that was statistically significant (p < 0.001). Figures 1 and 2 showed that Quezon City was an outlier in terms of population density but not in population. Excluding Quezon City and recomputing the Pearson correlation for population density resulted in r = 0.905, indicating a good correlation which was statistically significant (p < 0.001). Excluding Quezon City in the recomputation of Pearson's correlation for population showed a moderate to good correlation (r = 0.569, p = 0.021).

Sex and COVID-19 Cases

Using a phi and Cramer's V statistic, there was a very weak to no association between sex and COVID-19 (ϕ = 0.008, p < 0.001).

Population density and COVID-19 cases per sex

A Pearson correlation showed a weak to low correlation between population density and cases per sex that was not statistically significant (r = 0.264, p = 0.306). However, like population density and COVID-19 cases, removing Quezon City as a data point yielded a statistically significant, moderate to good correlation between population density and both sexes (r = 0.588, p = 0.017).

Age and COVID-19 cases

As shown in Table 3, there were more cases in the 20-24 years age group with a peak in the 25-29 and 30-34 years age groups (92.47 and 90.33 cases per 1000 population) and a higher incidence in the 65 years and older age groups. Phi and Cramer's V statistic showed a statistically significant moderate association between age and COVID-19 (ϕ = 0.145, p < 0.001).

Discussion

In this study, the researchers analyzed the relationship of population, population density, age, and sex, with the number of COVID-19 cases. The results show that in NCR, an increase in population may lead to an increase in the number of COVID-19 cases. This is similarly supported by previous research in Japan, New York, Madrid, and London.[14,15]

The continued movement and traffic of people engaged in face-to-face activities like social gathering events and industrial activity may also have a bigger effect on the rise of cases.[16] Conversely, access to private transportation may help stem the infection with COVID-19 by minimizing contact with infectious and susceptible individuals. In a study from Ethiopia, probable factors contributing to the fast spread of coronavirus include poverty, which leads to a poor way of life and an increased vulnerability to infectious diseases.[17] Poor access to personal protective equipment as well as the health care itself, large family size with poor housing, and citizens who engaged in risky working conditions in order to support their daily lives were some of the contributing factors on how poverty affects increasing COVID-19 cases, thus strong and continuous intervention is needed to support the poor during the pandemic.[17] In the Philippines, with a fairly high incidence of poverty and where more than 16% of the population are living below the poverty line, this may also be one of the reasons why cases are still increasing.[18]

A study showed that a reason why densely populated areas may have lower infection and mortality rates could be the presence of superior healthcare systems in these areas.[19] Sociodemographic characteristics and social inequities were noted as factors which can also affect the spread of infectious diseases, as well as prevent access to health care. This consequently led to higher rates of mortality. The study also recognized the nationwide shortage in testing capacity as one of the limitations related to data and methodology.[19] Since statewide testing rate was considered the most significant predictor of county virus infection rate in this study, testing capacity should also be considered as a factor in obtaining the accurate depiction of the COVID-19 cases in the study population.

Another possible explanation for the results could be the differing protocols per LGU and a very erratic and unpredictable national policy. The said differing protocols are due to the mandate for each LGU to adopt, coordinate, and implement guidelines in accordance to the given local protocols that should be implemented as set by the national government.[20] This is also supported by a study showing an increase in the Government Stringency Index, along with an increase in the number of beds per 1,000 people and number of physicians per 10,000 people, decreased the number of confirmed COVID-19 cases.[21] The study further posits that an increase in proportion of people with pre-existing health conditions, population density and high median age of the population would increase the number of confirmed COVID-19 cases.[21] This shows that there is a huge interplay between the different factors that may decrease or increase the number of COVID-19 cases in an area, with population density being just one of them.

It should be noted though that once Quezon City was eliminated as one of the variables, results showed a significant correlation and aligned with the literature.[14,15] This would suggest that there may be something unique to Quezon City for it to cause a drastic shift in results once it is removed. As cited earlier, in cities with higher socio-economic status and superior healthcare systems, the effect of population density on the number of COVID-19 cases may be lesser.[19] Given Quezon City's status as the country's wealthiest city until 2017, it may be suggested that their pool of resources may have been integral to their low prevalence rate, being second only to Caloocan.[22] Though they may have the most cases in NCR, this is but a small fraction of their population. Moreover, Quezon City is home to most of the hospitals in NCR, a possible indication of better healthcare systems available to its people.[23] The Cities and Municipalities Competitiveness Index (CMCI), an annual ranking anchored on the pillars of economic dynamism, government efficiency, infrastructure and resiliency has also been topped by Quezon City for the past four years, with capacity of health services being one of the key indicators.[24] It should also be noted that Quezon City has the highest employment rate among the different cities in NCR, which may have affected the results.[25]

Given the results shown in both scenarios, with and without Quezon City, it may be seen that population density, though an important factor, can be heavily affected by its interplay with other factors with regards to the effect on the rising number of COVID-19 cases. A deeper look into the effect of Quezon City's huge land area and population is recommended to see what effects they may have on the transmission of COVID-19. Moreover, implemented COVID-19 mitigation measures the city may be employing can be further studied and possibly be emulated by other cities. Future studies may investigate whether Quezon City's situation is just incidental to its vast area or if there are certain things the city is doing more efficiently that may explain these surprising results.

Another factor the study sought to investigate was sex and its relation to the rising number of COVID-19 cases in NCR. The study's results demonstrated an association between sex and COVID-19 cases, albeit weak and non-directional. As shown in Table 2, males in NCR across all age groups, except 15-19 and 20-24, were found to have higher prevalence per 1,000 cases. This is supported by the data from a study on clinical and demographic risk factors and COVID-19, wherein there were more cases of males than females in Pakistan.[26] Likewise, data in Germany and Switzerland showed that there was an increased incidence of COVID-19 infection specifically in males above 60 years old.[27] However, this is in contrast to a study stating that females of working age are more likely to be diagnosed with COVID-19, attributing this to the greater number of females in the healthcare profession.[28] Moreover, in an ecological study of incidence of COVID-19 and gender in 177 countries, the ratio of people above 60 years was positively associated with the incidence, noting a higher correlation in females than in males.[29] Yet, in a meta-analysis of 90 reports involving 46 countries, the results showed that the proportion of male cases was exactly half at 50%, indicating that males and females have similar numbers of infections.[30]

Nonetheless, though the effect size was small, the association prompted the researchers to further thresh out the relationship of sex and COVID-19 cases by comparing it to population density. Similar to this study's previously elaborated results, when NCR was evaluated as a whole, there was no significant correlation between the population density and sex of those who tested positive for COVID-19. When Quezon City was removed as a data point, the Pearson correlation between population density and both male and female cases proved significant. This suggests that an increase in the population density of a place would lead to higher cases in both genders. In both cases, with and without Quezon City, it was noted that males show a higher correlation with population density compared to females ($r = 0.264 > 0.206$; $r = 0.588 > 0.543$).

Given this, it would be helpful to understand what factors may lead to sex being a possible factor in the rise of COVID-19 cases in NCR. Aside from biological and genetic factors, differences in attitude may play a role in the difference in susceptibility among the two sexes. Rather than simply looking at sex as a risk factor for COVID-19, other factors may be investigated to increase knowledge and understanding on the spread of the virus. These may include the percentage of female health professionals, adherence to preventive measures, and adaptive behaviors. In a meta-analysis, gender demographics was cited as having association with adaptive behaviors during a pandemic.[31] These include health-protective factors such as being female, older, more educated, and non-white. Furthermore, in another study, females showed greater adherence to preventive measures than males, making the latter more vulnerable to infection.[32] Despite the fact that some actions such as making a livelihood and purchasing supplies could be possible reasons in increasing COVID-19 cases among males in NCR, this has to be studied further by future researchers. Future studies may give a look into the qualitative aspect of male and female behaviors during the pandemic as well as comparing other predisposing risk factors such as occupation, nature of occupation, and dynamics in the family to get a more coherent understanding of the apparent risk factor of sex.

Lastly, the study investigated how age and COVID-19 cases were related. The results showed a moderate association between age and COVID-19 cases. It must be noted that the age distribution was obtained from the 2015 census. This was non-directional and could not explain whether the association was linked to an increase or decrease in the age. This is partially supported by an ecological study of incidence of COVID-19 and age in 177 countries wherein age was found to be a significant determinant of COVID-19 infections. The study also found that the median age of 25 to 64 years old was strongly associated with the incidence rate of COVID-19.[29] Zoning in on the results of the study as shown in Table 3, a drastic increase from age group 15-19 and 20-24 and another spike from 20-24 and 25-29 is observed. A plateau in prevalence can then be observed from age groups 25-29 to 60-64 ranging from 72.32 and 93.69 prevalence per 1000. This is further supported by a study on COVID-19 infection rates across European countries which reported that individuals under the age of 19 are the least infected, while the population with the age over 20 have the most cases with a rising infection rate seen in the working group.[28] The working population are more likely to be mobile compared to other age groups, and thus more likely to encounter infectious individuals. On the other hand, another study suggested that children may be less likely to be infected due to their

stronger, more active immune response, less comorbid conditions, and clearer respiratory tracts because of lesser exposure to smoke, pollution, and other airway irritants.[32] This is in line with the safety protocols enacted by the Philippines wherein individuals below 18 and above 65 are generally not allowed to go out. Another factor that may be looked into is that age groups 0-4 until 15-19 are engaging in online classes rather than in-person classes, thus limiting their need to go out and get exposed. This may also indicate the effectiveness of the imposed quarantine restrictions banning those aged below 18 and those over 65 from going outside their residences.

There is also an observable disparity in the result of the above studies and the prevalence of COVID-19 among the groups from 65-69 until 80+ in NCR, wherein the prevalence remained high or even increased in some age groups. This may be due to their willingness to be tested secondary to symptomatic or even severe COVID-19. As aging is associated with increasing numbers of comorbidities such as cardiovascular diseases, hypertension, diabetes, congestive heart failure, cerebrovascular disease, chronic kidney disease, chronic liver disease, cancer, chronic obstructive pulmonary disease and asthma, these predispose older adults to more severe COVID-19 symptoms.[33] A study on age distribution and COVID-19 found that older adults are more likely to be tested since they more often present with symptomatic COVID-19.[34] Additionally, according to a systematic review and meta-analysis on the prevalence of comorbidities and COVID-19, hypertension and diabetes mellitus are the two most prevalent diseases in patients with COVID-19. The study then stated that it is intuitive that younger age groups are not showing too severe symptoms to make them refer to the hospitals and get tested and thus they remain undiagnosed.[35]

It is recommended that future studies investigate the willingness of each age group to get tested for COVID-19, which may be affecting the distribution of the number of cases across these age groups. The severity of symptoms and the presence of comorbidities in each age group can also be studied, all of which give a picture on understanding as to how age, and other factors linked to it, are related to COVID-19. Future studies may investigate the differences of testing rates between the LGUs. Further analyses per city and barangays within those cities may also be investigated as there may be differences in the possible results when the LGUs and their components are split into smaller sets of data.

The study has shown that population density and population have a good correlation with the number of COVID-19 after Quezon City was removed as a data point. There is a moderate association between age and number of COVID-19 cases. There is a very weak to no association between sex and COVID-19 cases.

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The correlation between the professional quality of life and job satisfaction of physicians and nurses currently working in COVID-19 areas of tertiary hospitals in Metro Manila and CALABARZON (Region IV-A)

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Abstract

Introduction   The COVID-19 pandemic put the healthcare worker's professional quality of life (ProQoL) and job satisfaction (JS) at risk. This study determined the correlation between ProQoL, and the nine facets of and overall JS of physicians and nurses working in COVID-19 areas in Metro Manila and CALABARZON tertiary hospitals. It also determined their demographics, and measured the ProQoL, and overall JS and its nine facets.

Methods Physicians and nurses working in COVID-19 areas of tertiary hospitals in Metro Manila and CALABARZON were recruited and asked to answer the Professional Quality of Life Scale Version 5 and Job Satisfaction Survey. Correlation between ProQoL and JS was determined through Spearman's correlation coefficient.

Results High overall JS among 90 physician and nurse respondents correlated with high compassion satisfaction (ρ = 0.310), low burnout (ρ = -0.480) and secondary traumatic stress (ρ = -0.240). Correlations were found between ProQoL, and overall JS and pay, supervision, contingent rewards, coworkers, nature of work, and communication. A strong negative correlation between pay and burnout was observed (ρ = -0.500).

Conclusion The overall JS of physicians and nurses has a moderate positive correlation with compassion satisfaction, moderate negative correlation with burnout, and low negative correlation with secondary traumatic stress. Pay and burnout have a strong negative relationship.

Key words: Professional quality of life, job satisfaction, COVID-19, compassion satisfaction, compassion fatigue

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COVID-19 was declared a public health emergency of international concern by the World Health Organization (WHO) in the first quarter of 2020.[1] As of November 2021, the Philippines had more than 2,800,000 recorded cases, with approximately 23,000 active cases and 46,000 deaths. The National Capital Region (NCR) had the largest percentage, followed by Region IV-A (CALABARZON), with approximately 850,000 and 490,000 recorded cases, respectively.[2] In August 2020, the Philippine College of Physicians (PCP) raised an alarm regarding healthcare

workers experiencing burnout from the increasing number of patients, falling ill while caring for them, and called for recalibration of the strategies in place to mitigate COVID-19.[3] More than a year into the pandemic, the cases continue to rise, with community transmission of the virulent Delta variant of SARS-CoV-2 bringing a new surge of active cases.[4] Despite the quarantine restrictions and protocols, hospitals are still overwhelmed and the healthcare workers exhausted due to the increasing demand for medical attention. Protests demanding for better working conditions, increased hospital workforce, and an end to government neglect and unpaid benefits, such as risk allowances and hazard pay, were held by the Philippine Nurses Association in September 2021.[5]

Professional quality of life is a relevant issue now more than ever as it deals with one's feelings towards their work that is altruistic in nature, such as those of healthcare workers.[6] It includes compassion satisfaction and compassion fatigue. The elements of compassion fatigue are burnout and secondary traumatic stress. Job satisfaction is composed of nine dimensions, which are pay, promotion, supervision, fringe benefits, contingent rewards, operative procedures, co-workers, communication, and nature of work.[7] A study on Slovakian helping professionals showed that a relationship exists between professional quality of life and job satisfaction.[8] However, in the Philippines, there is insufficient evidence addressing the relationship between the professional quality of life and overall job satisfaction especially among Filipino nurses and physicians, and more so during this pandemic. This study aimed to determine the correlation between the professional quality of life (ProQoL) and overall job satisfaction (JS) levels and each of the nine dimensions of JS of physicians and nurses working in COVID-19 areas of tertiary hospitals in Metro Manila and CALABARZON. It further aimed to determine the demographic characteristics, to measure the ProQoL using the Professional Quality of Life Scale Version 5, to determine the levels of JS across the nine subscales, and to determine the overall JS levels of physicians and nurses using the Job Satisfaction Survey.[6,7]

Methods

This is a correlational study that determined the relationship of ProQoL and JS among physicians and nurses employed in COVID-19 areas of tertiary

hospitals in Metro Manila and CALABARZON. This study utilized convenience sampling, and targeted physicians and nurses 20-65 years old, working in a COVID-19 intensive care unit, ward, operating room, or emergency room for at least three months. Those who have been clinically diagnosed with a mental illness were excluded. Sample size calculation, done through the UCSF Clinical and Translational Science Institute online sample size calculator for clinical research, yielded 82 participants.

Data collected using a self-administered questionnaire which consisted of a screening portion, informed consent form in English and Filipino, demographics questionnaire, ProQoL Scale and Job Satisfaction Survey via Google Forms. The screening questionnaire determined whether the respondents were eligible to participate in the study. The participants' demographic characteristics (e.g., age, sex, civil status, profession, years of working experience, specific COVID-19 area, and the location of their respective hospitals) were collected using the demographics questionnaire. The location of the hospital was based on the districts of Metro Manila: District 1 (City of Manila), District 2 (Mandaluyong, Marikina, Pasig, Quezon City, San Juan), District 3 (Caloocan, Malabon, Navotas, Valenzuela) and District 4 (Las Piñas, Makati, Muntinlupa, Parañaque, Pasay, Pateros, Taguig).

The Professional Quality of Life Scale Version 5 (2009) by Stamm was used to determine the level of ProQoL.[6] It is a 30-item self-reported questionnaire pre-categorized into compassion satisfaction (CS) and compassion fatigue (CF) with subscales for burnout (BO) and secondary traumatic stress (STS) using a Likert-type scale, ranging from 1 as "never" to 5 as "very often." Scores of 10 to 22 indicate low, 23 to 41 moderate, and 42 to 50 high levels, respectively, of CS, BO and STS. The alpha reliability of CS, BO, and STS were 0.88, 0.75 and 0.81, respectively.[6]

The Job Satisfaction Survey (1994) by Spector was used to measure JS. It is a 36-item scale composed of nine facets (*pay, promotion, supervision, fringe benefits, contingent rewards, operating procedures, coworkers, nature of work and communication*).[7] Each facet is assessed through four items, scored from 1 to 6, with 1 as "disagree very much" and 6 as "agree very much". Items that were negatively worded were scored reversely. For each facet, a total score of 4 to 12 indicates dissatisfaction, 13 to 15 ambivalence, and 16 to 24 satisfaction. For the overall JS, a score of 36 to

108 indicates dissatisfaction, 109 to 143 ambivalence, and 144 to 216 satisfaction. This survey had a total alpha reliability of 0.91.[7]

The data gathered for the demographic characteristics were tabulated with their frequency and percentage within the total number of respondents. Total scores for ProQoL levels were interpreted as low, average, or high while levels of JS were determined by getting the total scores, and classified as dissatisfaction, ambivalence, or satisfaction, both with their corresponding percentages within the total respondents. Mean and standard deviation values for ProQoL and JS were also calculated. Spearman's correlation coefficient was used to determine the strength of correlation between JS and ProQoL, analyzed using GNU PSPP ver 1.4.1. The results were visualized through scatter plots made via Microsoft Excel.

This study was approved by the Ethics Review Committee of the UERMMMCI Research Institute for Health Sciences. Informed consent was obtained from the participants.

Results

As shown in Table 1, there were 90 participants in this study, consisting of 43 physicians and 47 nurses. Around 75% were 20-39 years old, two-thirds were female, single, and with more than 10 years of working experience. Two out of three respondents were assigned in a COVID-19 ward or in the Emergency Room. Half of the respondents worked in a hospital in Districts 2 and 4 of Metro Manila. In terms of ProQoL, the participants experienced average levels of CS, BO, and STS. Majority of the participants had average levels of CS, BO, and STS; while none had experienced low CS, and only 1.11% had high BO and STS. Tables 2 and 3 show the frequency of levels and the mean scores and standard deviation of ProQoL. Majority of the participants showed satisfaction in

Table 1. Demographic profile.

		Number (n)	Percentage (%)
Age (years)	20-29	37	41.11
	30-39	31	34.44
	40-49	13	14.44
	50-59	8	8.89
	60-65	1	1.11
Sex	Male	28	31.11
	Female	62	68.89
Civil Status	Single	61	67.78
	Married	28	31.11
	Widowed	1	1.11
Profession	Physician	43	47.78
	Nurse	47	52.22
Years of Working Experience	<10 years	32	35.56
	>10 years	58	64.44
Specific COVID-19 Area	ICU	15	16.67
	Ward	32	35.56
	Operating Room	17	18.89
	Emergency Room	26	28.89
Location of Hospital	District 1, Metro Manila	15	16.67
	District 2, Metro Manila	23	25.56
	District 3, Metro Manila	1	1.11
	District 4, Metro Manila	27	30
	Cavite	9	10
	Laguna	4	4.44
	Batangas	1	1.11
	Quezon Province	10	11.11

terms of supervision, coworkers, nature of work, and communication. Majority of the participants showed dissatisfaction in pay, fringe benefits, and operating procedures. The participants showed almost equal distributions among satisfaction, dissatisfaction, and ambivalence in promotion and contingent rewards. Table 4 shows the frequency of levels of JS and the corresponding percentage.

Table 2. Levels of professional quality of life.

	Level	Number (n)	Percentage (%)
Compassion Satisfaction (CS)	High	32	35.56
	Average	58	64.44
	Low	0	0.00
Burnout (BO)	High	1	1.11
	Average	66	73.33
	Low	23	25.56
Secondary Traumatic Stress (STS)	High	1	1.11
	Average	60	66.67
	Low	29	32.22

Table 3. Mean scores and standard deviation of ProQoL scale components.

	Mean $^+$ SD	Level
Compassion Satisfaction (CS)	38.58 ± 6.46	Moderate
Burnout (BO)	26.20 ± 5.78	Moderate
Secondary Traumatic Stress (STS)	26.29 ± 7.20	Moderate

Table 4. Levels of job satisfaction.

	Level	Number (n)	Percentage (%)
Pay	Satisfied	17	18.89
	Ambivalent	31	34.44
	Dissatisfied	42	46.67
Promotion	Satisfied	31	34.44
	Ambivalent	31	34.44
	Dissatisfied	28	31.11
Supervision	Satisfied	42	46.67
	Ambivalent	31	34.44
	Dissatisfied	17	18.89
Fringe benefits	Satisfied	11	12.22
	Ambivalent	29	32.22
	Dissatisfied	50	55.56
Contingent rewards	Satisfied	24	26.67
	Ambivalent	31	34.44
	Dissatisfied	35	38.89
Operating procedures	Satisfied	9	10.00
	Ambivalent	25	27.78
	Dissatisfied	56	62.22
Coworkers	Satisfied	56	62.22
	Ambivalent	27	30.00
	Dissatisfied	7	7.78
Nature of work	Satisfied	62	68.89
	Ambivalent	21	23.33
	Dissatisfied	7	7.78
Communication	Satisfied	43	47.78
	Ambivalent	32	35.56
	Dissatisfied	15	16.67

The results of the Spearman correlation analyses seen in Table 5 showed multiple significant ($p \leq 0.050$) relationships between the components of ProQoL and the nine facets of JS. High levels of overall JS were correlated with high levels of CS ($\rho = 0.310$; $p < 0.050$) and low levels of BO ($\rho = -0.480$; $p < 0.050$) and STS ($\rho = -0.240$; $p < 0.050$). There was a strong correlation between low levels of pay and high levels of burnout ($\rho = -0.500$; $p < 0.050$), as seen in Figure 1.

Discussion

Levels of Compassion Satisfaction, Burnout, and Secondary Traumatic Stress

The overall ProQoL of the participants was average; in terms of CS, they neither derived significant satisfaction from their job nor did they have issues with their job. The same is applicable

Table 5. Spearman correlations between professional quality of life and job satisfaction.

	CS		BO		STS	
	ρ	p	ρ	p	ρ	p
Pay	0.390[m]	0.000*	-0.500s	0.000*	-0.250[l]	0.020*
Promotion	0.200	0.060	-0.120	0.253	0.020	0.889
Supervision	0.360[m]	0.001*	-0.390[m]	0.000*	-0.250[l]	0.018*
Fringe benefits	-0.12	0.241	-0.120	0.27	-0.040	0.705
Contingent rewards	0.260[l]	0.015*	-0.290[l]	0.006*	-0.230[l]	0.031*
Operating procedures	0.050	0.625	-0.110	0.292	-0.140	0.204
Coworkers	0.320[m]	0.002*	-0.220[l]	0.039*	-0.300[m]	0.004*
Nature of work	0.490[m]	0.000*	-0.420[m]	0.000*	-0.220[l]	0.034*
Communication	0.310[m]	0.003*	-0.370[m]	0.000*	-0.260[l]	0.015*
Overall job satisfaction	0.310[m]	0.003*	-0.480[m]	0.000*	-0.240[l]	0.024*

CS - compassion satisfaction; BO - burnout; STS - secondary traumatic stress
ρ - Spearman correlation coefficient; p - significance
l - low correlation; m - moderate correlation; s - strong correlation
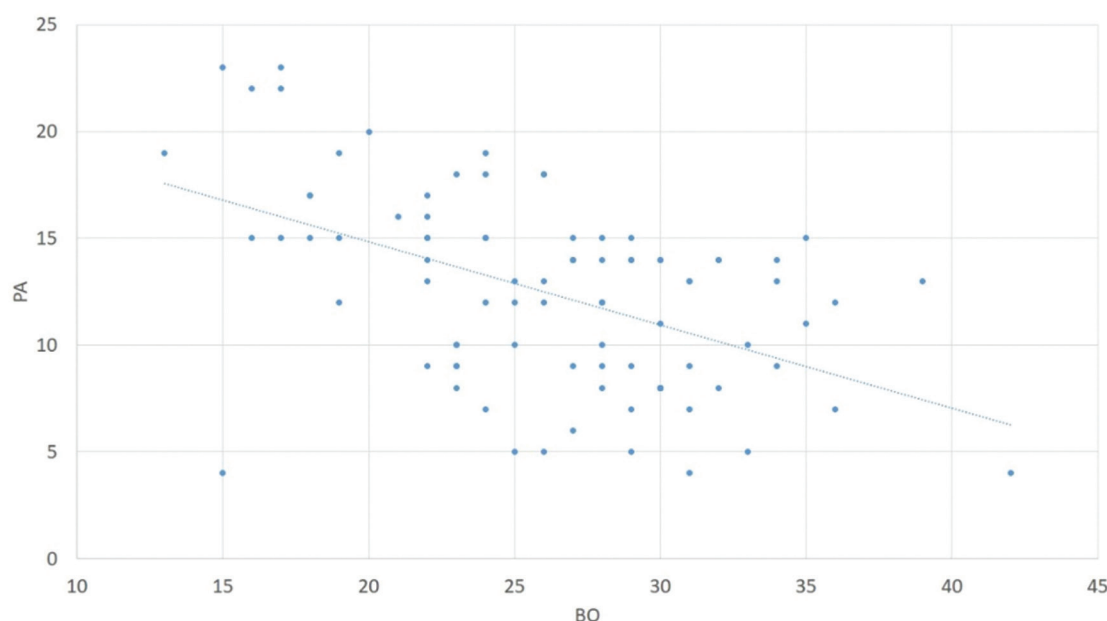

Figure 1. Scatterplot of correlation between Pay (PA) and Burnout (BO).

to the components of compassion fatigue (CF) as these individuals neither felt that they had positive feelings about the effectiveness of their work nor felt burnt out by it; and they neither felt that their work was frightening nor necessarily an object of concern.

Job Satisfaction and its Nine Facets

The components of JS that the respondents were dissatisfied with were the pay, fringe benefits, and operating procedures. Dissatisfaction may be attributed to the state of the healthcare workers during the pandemic. Nurses and doctors are underpaid, and hazard pay is lacking.[9,10] Dissatisfaction with salary and fringe benefits is one of the reasons that have pushed them to seek employment abroad.[11] The Alliance of Healthcare Workers (AHW) called for an increase in the salaries of healthcare workers as it no longer met their everyday needs and the hiring of more healthcare workers to meet the demands of the rising number cases.[12] The aspects that the respondents were generally satisfied with were supervision, coworkers, nature of work, and communication. The positive results of these components may be considered protective factors despite the aspects that were dissatisfying to the doctors and nurses. Aspects that generally showed ambivalence included contingent rewards, promotion, and their overall JS scores. The results of the overall JS may be attributed to the facets that the respondents were satisfied with and those that they were dissatisfied which balanced each other out.

Job Satisfaction and CS, BO, STS

The results indicate that overall JS is positively correlated with CS, and negatively correlated with BO and STS, which is consistent with other studies.[8,13-15] With that, improved JS levels may lead to a better ProQoL, which further positively influences the quality of patient care. Maroof and colleagues' research suggested that the correlations may vary between CS, BO, and STS and the components of job satisfaction rather than the overall JS.[16]

Compassion Satisfaction and Facets of Job Satisfaction

Among the facets of JS, pay, supervision, coworkers, nature of work, and communication

showed moderate positive correlation with CS. Good pay, proper supervision, contingent rewards, good relationships among coworkers, nature of work, and communication lead to a healthcare worker to have higher CS. Present findings on pay are in line with previous studies where nurses with higher monthly salaries had higher CS.[8,16] The results on coworker and CS were similar to the findings of Balinbin that coworker relationships had a positive impact on CS among Filipino and Serbian nurses and trauma nurses.[17-19] The findings on supervision are consistent with previous studies that good quality supervision was associated with CS.[20,21]

In terms of the nature of work, the results were similar those of Köverová, who found that of the nine facets, it was the most strongly correlated with CS.[8] They experienced satisfaction when their work created positive emotions such as pleasure, pride, joy, and a sense of meaning. One of the very definitions of CS by Stamm can explain this positive correlation, which is the belief that one's work can contribute to the betterment of society.[6] Thus, it can be expected that when one does not find meaning in his/her work or like what he/she does, as what Spector meant by "nature of work," low CS may also be seen.[7] Communication also showed moderate positive correlation with CS. A narrative literature review supported that communication with supervisor and peers is moderately correlated with JS among nurses.[22] One of the aspects that the professionals in Slovakia were most satisfied with was having clear and explained work assignments and organizational goals.[8]

Contingent rewards showed a low positive correlation with CS, a finding noted in Chinese nurses and critical care nurses.[23,24] Promotion had a low positive correlation with CS, unlike the findings of a significant and very strong relationship between promotion and employee satisfaction. Berinyuy and Forje concluded that promotion is a motivation that can strongly take part in the psychological well-being of their employees, enough to make their own goals merge with those of the organization's, resulting in their job satisfaction.[25] Operating Procedures had low positive correlation with CS. Wentzel noted that given increased workload or exposure to stressors, nurses are able to maintain the same level of care.[26] Fringe Benefits was the only component that showed a negative correlation with CS. A positive relationship, however, was seen in Köverová's study.[8]

Burnout and Facets of Job Satisfaction

Out of all the components of ProQoL and JS, burnout and pay showed the strongest correlation, with a negative relationship: the less satisfied the respondents are with their pay, the more the burnout is experienced. Several news reports from Philippine publications have reported low salary as one of the reasons of COVID-19 nurses who resign to pursue other career paths, or leave for abroad.[12,27,28] They were also reported to be burnt out. The results of this study conicided with those of Köverová.[8] Dahmash also found that the odds of experiencing burnout decreased when there was satisfaction with salary.[29] However, the findings did not coincide with Balinbin's where higher monthly income was significantly associated with burnout.[17] They proposed that higher pay meant having higher demands and expectations from their job.

Nature of work, supervision and communication were found to have moderate negative correlations with burnout, all of which were consistent with what was seen in Köverová's study.[8] In his study, the nature of work had the strongest correlation among all components and was the best predictor of burnout. Rasmussen stated that when clinicians believe that their work has meaning, it serves to protect them from burnout.[30] Findings on supervision are consistent with previous studies on burnout.[31,32] Communication within the organization was related to JS, as found in a study that the relational, informational/relational and informational dimensions of communication are associated with JS, and the latter is associated with burnout, to which findings of this study are similar.[22]

Contingent rewards, coworkers, promotion, fringe benefits, and operating procedures showed a low negative correlation with burnout, consistent with Köverová's findings.[8] Contingent rewards or verbal expression of appreciation from supervisors, coworkers, and patients, such as a "job well done," is seen as a reward that matters to clinicians.[33] According to Harris and Russell, decreased levels of burnout were associated with average amounts of contingent reward leadership behavior. However, as individuals are exposed to high work demands the effects of contingent rewards in reducing burnout and stress may diminish at a certain point. These demanding circumstances push workers to expend resource stores, thereby increasing stress and burnout leading to a lower job satisfaction.[34]

Coworker relationships contribute to the work environment. The results of this study are consistent with the findings on trauma nurses in the United States and Filipino nurses where those with greater burnout levels had poor relationships with their coworkers.[17,19] However, Kase found that in pediatric subspecialists during the early part of the COVID-19 pandemic, coworker relationships were not associated with high BO, unlike prior to the pandemic.[35] They proposed that having different work modes (e.g., work from home) and changing procedures in the hospital may have changed the impact on stress from certain sources.

The findings of this study showed that promotion had negative correlation with BO as seen in Köverová's study.[8] In another study among nurses, it was found that all the subscales of BO (i.e., emotional exhaustion, depersonalization, and personal accomplishment) were associated with satisfaction with promotion. However, the direction of association, whether positive or negative was not indicated in the study.[36] This study showed that promotion had an insignificant correlation with BO. Fringe benefits negatively correlated with BO, similar to what was found in Köverová's research.[8] Rosales, after reporting that nurses from Philippine government hospitals in Samar were moderately unsatisfied with fringe benefits, explained that satisfaction with fringe benefits results in higher job satisfaction, and therefore the prevention of burnout.[37] However, Cragg showed that fringe benefits were a significant negative predictor of burnout.[38] Operating procedures had a negative correlation with BO which was consistent with previous studies.[8,39,40,41]

Correlation Between Secondary Traumatic Stress and Facets of Job Satisfaction

Among all the components of JS, coworkers was the only component with moderate negative correlation with STS, while the rest of the components with statistically significant correlation showed low degrees of correlation which was consistent with studies on Filipino nurses and on Slovakian helping professionals.[8,17] Relationships with coworkers can be tied with relationships with supervisors in the context of work environment. Support from both groups can decrease stress and other negative emotions.[41,42] Bock found that those with STS had poor support from their colleagues and supervisors.[42] These findings explain the negative relationship of supervision and STS. There are few studies investigating the relationship between

pay and STS, especially in physicians and nurses. Though salary from work was not the only source of income of a person, it was found that monthly income is a predictor of STS.[43] In contrast, higher income was found to be a significant determinant of STS as it was associated with a heavier workload.[17]

Contingent rewards demonstrated a negative relationship with STS. Bock emphasized that appreciative and constructive feedback should be required in work as social support from superiors to encourage a conducive work atmosphere and protect from STS.[42] The negative relationship between nature of work and STS is consistent with the findings of Passmore among child abuse pediatricians.[44] The findings are consistent with those of Köverová.[8] Communication within the organization is negatively correlated with STS. A study on Filipino nurses recommended developing communication strategies to enhance nurse colleague relationships, which were found to be a determinant of CF, including STS.[17] Fringe benefits negatively correlated with STS in this study, similar to what was seen by Köverová.[8] However, there were no studies seen that associated or studied the influence or effects of fringe benefits and STS to explain the correlation.

Operating Procedures and STS showed a low negative correlation, as was observed by Bellicoso that dissatisfaction with operating procedures predicted higher STS. They hypothesized that this may be because some hospital policies increase the susceptibility of hospital workers to the negative emotional effects of their hospital duties.[40] The results were also similar to Blanco-Donoso's, who further suggested that workload, along with social pressure, and witnessing death and suffering, hospital workers had increased levels of physical and emotional stress in their work environment.[45] Promotion showed a low positive correlation with STS. However, the result of this study contrasted with the findings of Köverová which showed a negative correlation.[8]

Insignificance of Promotion, Fringe Benefits and Operating Procedures

Promotion was found to be not significantly correlated with ProQoL. This may be due to the state of the healthcare profession in the Philippines which was amplified by the COVID-19 pandemic. A study on the turnover intention among nurses in Samar showed that poor working conditions was one of the main reasons for nurse turnover.[46] It was found that younger nurses had higher turnover rates when they were initially confronted with the realities of the profession in the Philippines, specifically the low pay and lack of advancement opportunities.[46] A study on Filipino nurse migration to the U.S. and Canada showed that many nursing students have a mindset to leave the country and work overseas after graduating since there is a belief that there is less opportunity for growth and proper compensation in the Philippines.[47] It is possible that the ambivalence towards promotion stems from the acceptance of the realities in the country. Additionally, the COVID-19 situation may have further shifted the focus away from career advancement to more immediate needs. A study on fear of COVID-19 and psychological distress on work satisfaction among Filipino frontline nurses showed that fear associated with coronavirus led to higher dissatisfaction with their job, and increased intention to leave the profession.[48] Moreover, high stress and anxiety levels have led Filipino healthcare workers to repeatedly request for a "time-out" from the government.[49] A study on the lived experiences of Filipino nurses working in COVID-19 quarantine facilities showed that there is lack of support in terms of proper financial compensation, adequate PPE supplies, and proper administrative strategies.[50]

Fringe benefits also showed insignificant correlation with all components of ProQoL. In February 2021, the Alliance of Health Workers (AHW) protested for a wage hike.[12] A salary increase would result in long-term compensation while allowances would only be given during the pandemic. This could explain why the findings of this study showed insignificant correlation between fringe benefits and the ProQoL components. Another protest held by AHW in September 2021 was for the release of government benefits for healthcare workers (HCW) serving during the pandemic, including the special risk allowance (SRA), meals, accommodation, and transportation (MAT) benefits.[51] Another protest was held due to the proposal for a "singular allowance" among HCWs, in which monthly allocations will be categorized based on low, medium or high exposure to patients with COVID-19 infection.[52] The Filipino Nurses United (FNU) claimed that the recent benefits coming from the SRA and MAT will be cut if consolidated into this "singular allowance."[53] Physicians and nurses could have been less bothered or unaware of having additional benefits since there is

a continuous dissatisfaction on the proposed benefits offered by the government, and could have led to hopelessness. They may have tended to focus more on their job instead of demanding for more additional benefits.

The Philippine Health Insurance Corporation (PhilHealth) released the PhilHealth Circular No. 2020-0011 which ensures full financial risk protection for COVID-19 hospitalization among HCWs during the whole duration of this pandemic.[54] This could also explain the insignificance of findings in this study since HCWs may be less concerned with this benefit because they were entitled to full hospitalization coverage. It is also unknown whether the respondents belong to public or private hospitals as it was not asked in the present study; hence, the benefits and its source may differ.

Operating procedures. The increasing number of cases, exacerbated by the appearance of the delta variant has forced hospitals to modify their operations by converting non-COVID-19 areas into COVID-19 areas, and requiring telemedicine consultations prior to hospital visit.[55,56] The readjustments for surges in cases can cause distress in the working environment. Thus, the constant switching of procedures and handling of the cases may have contributed to the insignificance of this factor to the correlation between the operating procedures and CS, BO, and STS, as the HCWs will have keep on adjusting to new hospital protocols.

To conclude, the overall JS of physicians and nurses has a moderate positive correlation with compassion satisfaction, moderate negative correlation with burnout, and low negative correlation with secondary traumatic stress. Among the nine facets of JS, pay has the strongest correlation with ProQoL, and BO, a negative relationship.

Limitations

This study made use of convenience sampling. It did not determine the reasons behind the ProQoL and JS levels and the predictors of each variable and did not distinguish between private and public hospitals. Several confounding variables which may have affected the results include the training on caring for COVID-19 patients, having other sources of stress outside work, variation in hospital protocol, and/or working conditions, such as healthcare worker-patient ratio.

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The lived experience of UERMMMCI student nurses: The untold stories of home confinement during the first 3 months of COVID-19 lockdown

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Abstract

Introduction The COVID-19 pandemic has forced countries to impose lockdowns. The aim of the study was to explore lived experiences of student nurses during their home confinement and acquire the shared meaning of the phenomenon among the participants. In this study, the researchers explored the impact of home confinement on student nurses to gain a thorough understanding of their perceived experiences, including their personal feelings, responses to the pandemic and learnings.

Methods The researchers used a descriptive phenomenological approach, wherein student nurses from all levels were selected through purposive sampling and were interviewed one on one through Zoom using a semi-structured open-ended questionnaire. The researchers utilized Colaizzi's method of analysis to extract their lived experiences during their home confinement during the first three months of COVID-19 lockdown.

Results The results resulted in eight themes: Delighted, Attitude Towards the Disease, Home Isolation, Situational Awareness, Stronger Connection, Adaptation to Change, Role Function, Psychological Development and Outlook.

Conclusion Based on Sister Callista Roy's Adaptation Model Theory, there is a direct relationship between the stimuli, coping and behavior of the participants.

Key words: Long term home confinement, COVID-19 pandemic, new normal

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The COVID-19 pandemic has been a global concern that has forced countries to impose a lockdown.[1] It is a threat to life and manifests as pneumonia, fever, difficulty of breathing, and lung infection.[2] The transmission of COVID-19 may be direct, through droplets from human to human interaction, or indirect transmission, like contaminated objects and airborne contagion.[3] The first person to be identified with COVID-19 was reported in Wuhan, China in December 2019.[4] Twenty three days after the first case of the viral pneumonia outbreak in Wuhan, the World

Health Organization announced that COVID-19 was a Public Health Emergency of International Concern (PHEIC).

The first recorded COVID-19 case in the Philippines was a 38-year-old Chinese female on January 30, 2020. The first death was recorded on February 2, 2020 and was also the first death outside China; in the same month, the third case was a 60-year-old female, a Chinese national. The three cases had a history of travel to Wuhan.[4] On March 12, 2020, the Inter Agency Task Force (IATF) was activated and tasked to manage the emerging infectious disease COVID-19. The IATF on COVID-19 later raised Code Red Sublevel in the Philippines which included the suspension of classes in Metro Manila, prohibition of mass gathering, and implementation of an enhanced community quarantine (ECQ) and strict lockdown in Metro Manila. ECQ and strict lockdown included strict home confinement for all family members with only one person per household allowed to go out for essential goods, suspension of transportation in Metro Manila, and checkpoints along city and provincial boundaries manned by uniformed personnel. People felt vulnerable due to the lockdown and quarantine throughout the COVID-19 pandemic. Singh mentioned that the COVID-19 pandemic brought fear and anxiety especially for children and adolescents who are known to be always outside for social interaction were forced to stay in their home.[5]

Despite a wide variety of studies around, there are few studies on how student nurses' experiences were elicited during their home confinement in the first three months of the COVID-19 lockdown. Thus, the goal of the study is to explore lived experiences of student nurses during their home confinement and acquire the shared meaning of the phenomenon among the participants. In this study, the researchers explored the impact of home confinement on student nurses to gain a thorough understanding of their perceived experiences, including their personal feelings, responses and learnings.

Methods

The researchers did a qualitative study using a phenomenological approach to obtain descriptive data of the behavior and the firsthand words from the clients as phenomenologists view human existence as meaningful and interesting because of their consciousness of that existence.[6,7] Student nurses of UERMMMCI who experienced home confinement during the first three months (March to May) of the COVID-19 lockdown aged between 18-25 years old who were currently enrolled in the SY 2020-2021, had an access to laptop, phone, or iPad and had a stable internet connection were recruited through Zoom, Google Meet or Facebook Videochat. Irregular students and those who did not attend the orientation were excluded. Participants were recruited through purposive sampling until theoretical saturation (the point in data collection when new data no longer brought additional insights to the research questions) was reached.

The questionnaire consisted of five open-ended questions that covered the respondent's experiences, feelings, response to the announcement of the lockdown, relating with people in the household, and learnings during home confinement. The interviewers asked the respondents to elaborate on their answers to each question. The instrument was pilot tested on Level III nursing students. Student nurses who qualified and gave their informed consent were oriented on the study and interviewed online using Zoom. The interviews lasted for 1 to 2 hours and were recorded with the permission of the participants. The interviews were transcribed from the recordings; the transcriptions were used for the data analysis.

The data was analyzed using Colaizzi's descriptive phenomenological method and the constructivist paradigm was used.[8] The researcher first familiarized himself or herself with the data by reading through all the participant accounts several times. Second, the researcher extracted significant statements in relation to the research question. Third, the researcher distinguished implications relevant to the phenomenon that emerged from cautious consideration of the critical statements. The researchers reflexively "bracketed" their pre-assumptions to adhere to the phenomenon as experienced (formulating meanings). Fourth, the researchers clustered the formulated meanings into themes that were basic across all records. Fifth, the researchers developed an exhaustive description where they composed and articulated a description of the phenomenon from all the clustered themes. Sixth, the researchers produced the fundamental structure in which they condensed the exhaustive description to a short, compact statement that captured those aspects deemed to be essential to the structure of

the phenomenon. Seventh, the researchers sought verification of the fundamental structure by returning the summarized data to all participants to confirm if the structure made by the researchers was really the participants' experience/s.

Results

There were five respondents with an average age of 19.2 years (range 18 to 21 years), three of whom were female. Two participants were in Level III and the rest were in Levels I, II and IV. The results obtained from the participants' interview exhibited their actual experiences during the three-month lockdown period. The formulated meanings centered on 1) actions that the participants did; 2) negative effects of the phenomenon; 3) the change in perception on the situation; 4) acquisition of information; 5) formation of bonds; 6) action undertaken to overcome the situation; 7) exposure to a different setting; 8) accountability that the participant developed; 9) apprehension of the phenomenon that the participant experienced; 10) honing of oneself during the phenomenon. The similar formulated meanings were grouped into 34 clustered themes as shown in Table 1. The clusters were further grouped into eight emerging patterns or themes - Delighted, Attitude Towards the Disease, Home Quarantine, Situational Awareness, Stronger Family Ties, Adaptation to Change, Personal Role and Contribution, Psychological Development and Outlook as shown in Table 2.

Table 1. Formulated meanings and clustered themes.

Formulated meanings	Clustered themes
• PT1: Happy without knowing what the situation entails; saw the phenomena as a suspension of classes • PT4: Happy with the cancellation of exams • PT5: The lockdown was like a summer vacation because there is no task to be done	Initial reaction to the announcement of the phenomenon
• PT3: He and his family got closer and bonded together which made him happy • PT5: Happy because she reunited with her family • PT5: Excitement of going home due to homesickness	Family reunification
• PT2: Fear that going out entails risk of compromising the health of a vulnerable individual • PT2: Death of family members with common risk factors resulted in fear of going out • PT4: Concern on family's health and safety Perception of exposure to the virus	Decline in mental health
• PT2: Mental health worsened as the virus infects her family members • PT2: Overthinking on possible preventive measures • PT2: Lack of social interaction led to unstable situations putting her mental health at risk • PT2: The repetitive cycle and inability to go out led her to feel like she was going crazy • PT3: Insomnia worsened	
• PT4: The great amount of schoolwork was a burden leading to neglecting oneself • PT5: Altered sleeping pattern Inadequate self-care	
• PT1: Social media as the source of stress with regards to recent happenings and unhealthy relationships • PT3: Stressed initially because of the vulnerable age of his father. • PT3: Insomnia adding to his stress. • PT3: Variety of stressors • PT5: Contradicting mindsets within the family was chaotic and frustrating • PT5: Irritation led to less communication	Stressors
• PT2: The history of death of family members with common risk factors resulted in fear of going out. • PT2: Fear regarding her health condition and of her child • PT3: Fear of acquiring the virus	Feeling of fear

• PT1: The house as a resting place	Comfort zone
• PT3: Went home when the lockdown was announced	
• PT4: Doesn't feel like her room is her safe place anymore due to endless workload	
• PT5: Alone in her pad	
• PT1: Staying at home was being a prisoner	Being secluded from the outside world
• PT2: Felt isolated from the outside world	
• PT4: Felt locked up inside her room with piled up requirements	
• PT4: Restricted from going outside	
• PT4: Pile of workload restricted her from going out.	
• PT2: COVID was the usual topic being talked about with her family	Concern on current events
• PT3: Interest in political and financial awareness	
• PT5: Torn between two emotions since the announcement of the phenomenon is a novel news	
• PT2: Found out about the phenomenon through her mother as she was not updated on the recent events	Obtaining of information
• PT3: Acquired information regarding the steps of the government through his sister	
• PT4: Updated through social media	
• PT2: There is uncertainty on next steps on enrollment	Lack of information during the novel situation
• PT2: Lack of knowledge and uncertainty of the virus, resulted in fear	
• PT3: Uncertainty on what to do	
• PT3: Inadequate knowledge leading to curiosity, confusion, and uncertainty	
• PT4: COVID-19 cases were insignificant resulting in elated experience	
• PT4: Uncertainties made her scared and nervous	
• PT5: Uncertainty brought confusion	
• PT2: Social interaction is needed in order to survive and develop oneself	Social interaction
• PT4: Realization of importance of face-to-face interaction	
• PT3: Communication was the family's response to the situation	Communication
• PT3: Communicates with friends through online platforms	
• PT4: Importance of communication between colleagues	
• PT1: Talking with each other enabled their family to be closer	Reaching out to family members
• PT3: Made him and his siblings open to one another	
• PT3: Conversing over shared experiences, stories and lives leading to closeness with his family	
• PT5: Understanding among siblings	
• PT5: Sharing of problems brought her closer to her siblings	
• PT5: Shared her emotions with her siblings	
• PT3: Routine consisted of entertainment activities and talking to friends	Forms of bonding
• PT4: Leisure activities as a form of bonding	
• PT5: Conversing and leisure activities as forms of bonding with her siblings	
• PT1: Bonding with his brother by watching since his parents are managing their business	Enhanced closer relationship
• PT1: Bonding with his family by talking about the same interests	
• PT2: Close affiliation with the people she was living with	
• PT2: Closeness through bonding with her family	
• PT3: Bond with siblings brought them closer	
• PT3: Casual relationship with his siblings	
• PT3: Talking and joking around with one another as their bonding	
• PT4: Happy because her family role enhanced their bonding	
• PT4: Joy in completing their tasks which made her family closer	
• PT4: Bonds with her family through showing affection and teasing	
• PT3: Family and friends as his support system	Support system
• PT5: Support system as her source of motivation	

• PT2: Mother's Day was the only significant thing that happened during the lockdown • PT3: The lockdown made his family members stay in one place • PT3: The participant's family was complete during the lockdown	Rare occurrences
• PT1: COVID affected the livelihood of the family • PT2: It was tough since many relatives died • PT3: Uncontrolled situations caused intimate relationship problems	Unforeseen circumstances
• PT1: Reads books to relax	Coping mechanism
• PT1: Routine of waking up, doing household chores, and playing PS4 • PT4: The routine included doing schoolwork and watching • PT5: Routine became a repetitive cycle but she was able to try new activities	Cycle of routine during the lockdown
• PT1: Not able to do things he could do before such as going out • PT1: Change in routine because of the lockdown restrictions • PT1: Cycle was tiring • PT1: Change of emotions from having fun to being exhausted from the clashing of responsibilities • PT2: Change of routine brought by the lockdown from being able to go out to staying inside the house • PT3: Staying at home with restrictions was the only thing that changed in his routine • PT4: Small difference with regards to her routine	Changes in routine
• PT4: Difficulty in adapting to a new learning setting • PT4: Hard to cope to the new normal • PT5: Phenomenon was chaotic since the family is not used to being with one another	Unfamiliarity to new situations
• PT2: Panic buying was the response • PT2: Not new to staying at home, but the situation was difficult since there was limited access to supplies • PT2: Lack of resources limited her performance of daily activities • PT2: Difficulty of adjusting in obtaining needs and wants • PT2: Difficult to access healthcare and consultation due to fear • PT4: Possibility of food scarcity	Uncertainties on the access to limited resources
• PT1: Became a responsible family member • PT2: Thoughtful of her family on what they needed to do • PT3: He improved as a family member	Role engagement
• PT2: Routine depended on her child • PT2: He became the leader in her family which led her to show her maternal instincts	Maternal role
• Imparted health education to her family • Exhibited therapeutic communication by embodying the role of a student nurse	Application of being a student nurse
• PT1: More grateful in life • PT1: Recognized the importance of family and time • PT1: New learnings and realizations • PT3: Respecting other people's opinion by practicing active listening • PT4: Being considerate of other people's situations is good but in moderation • PT5: Different age groups have different perspectives	Realizations
• PT1: Lost interest • PT3: A family life event greatly affected his point of view in life	Outlook during the three-month lockdown
• PT4: Lockdown snatched her time • PT4: Importance of time management to do self-care • PT4: Sunday is the rest day • PT4: Realization of the importance of time spent with family and friends	The importance of time

- PT1: Got to know himself more; rediscovered hobbies and weaknesses   Self-awareness
- PT2: Able to improve herself and boost her confidence
- PT3: Became more mature and improved as a person
- PT3: Became future-oriented

- PT2: The lockdown brought enhancement and new discoveries   Self enhancement
- PT2: Became more resourceful and invested in technology
- PT3: Change in attitude towards his studies and worked harder
- PT5: Became an organized person by improving her time management,
      resulting in motivation for completing tasks

- PT2: Learned how to budget her finances and utilize resources at home   New learnings
- PT2: The difficult transition and adjustment of learning made her resourceful
- PT3: Acquired a new hobby

Table 2. Emerging themes derived from the clustered themes.

Clustered Themes	Emerging Themes
Initial reaction to the announcement of the phenomena Family reunification	Delighted
Perception of exposure to the virus Decline in mental health Inadequate self-care Stressors Feeling of fear	Attitude towards the disease
Comfort zone Being secluded from the outside world	Home quarantine
Concern on current events Obtaining of information Lack of information during the novel situation	Situational awareness
Social interaction Communication Reaching out to family members Forms of bonding Enhanced closer relationship Support system	Stronger family ties
Rare occurrences Unforeseen circumstances Coping mechanism Cycle of routine during the lockdown Changes in routine Unfamiliarity to new situations Uncertainties on the access to limited resources	Adaptation to change
Role engagement Maternal roles Reflection Application of being a student nurse	Personal role and contribution
Realization Outlook during the three-month lockdown The importance of time Self-awareness Self-enhancement New learnings	Psychological development and outlook

Discussion

The researchers were able to elicit eight emergent themes from the output of the participants: Delighted, Attitude Towards the Disease, Home Quarantine, Situational Awareness, Stronger Family Ties, Adaptation to Change, Personal Role and Contribution, Psychological Development and Outlook. The conceptual illustration (Figure 1) adapted from Sister Callista Roy's Adaptation Theory describes the experiences of the student nurses during the first three months of the COVID-19 lockdown.[9] It depicts how the lockdown as the stimulus affected and transformed the lives of the participants. The student nurses were able to cope with different situations from physiologic-physical elements (home quarantine, attitude towards the disease and situational awareness), self-concept group identity (physiological development and outlook), interdependence (stronger family ties), and role function (personal role and contribution). These elements helped the student nurses cope with the circumstances brought about by the pandemic. Finally, the student nurses exhibited delight as they were able to utilize these coping mechanisms to adapt during a time of crisis.
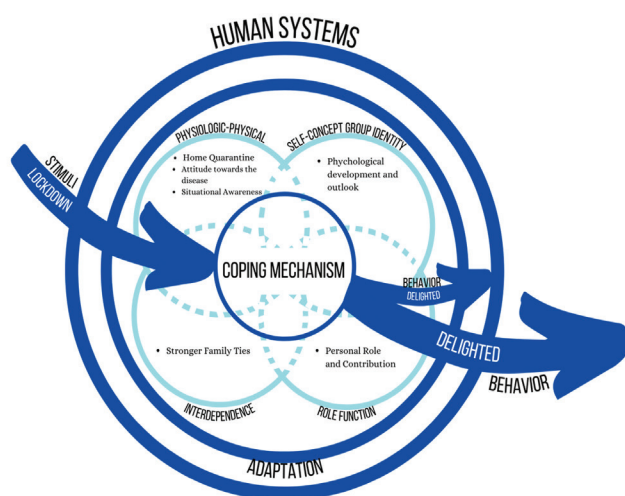

Figure 1. Conceptual illustration. The stimuli prompt the participants' adaptation. Adaptation consists of four adaptive modes: physiological functions, self-concept, role function, and interdependence. These adaptation modes are the coping mechanism of the participants and resulted in their behavior.

Conflict of interest declaration

The authors certify that they have NO affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript.

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The lived experiences of stay-in nurses and nursing aides in a private hospital in Quezon City during the coronavirus pandemic

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Abstract

Introduction The COVID-19 pandemic caused traumatic events among health care workers. They are the ones who are exposed to the virus as frontliners. The study aimed to explore the experiences and impact of the pandemic on the physical, psychological and emotional aspects of both nurses and nursing aides.
Methods This was a qualitative interpretative phenomenological study, focused on describing the individual nurse's and nursing aide's lived experiences as stay-in personnel in a private hospital in Quezon City catering to COVID-19 patients. Participants were selected by purposive sampling. They were interviewed using a semi-structured questionnaire on how the pandemic affected their physical, psychological and emotional well-being. The qualitative data collected was coded and categorized according to themes that described their lived experiences.
Results The three themes derived were: impact of a pandemic, strategies and coping, and psychological outcome for the three interview questions. Impact of a pandemic included isolation from the family (loneliness/sadness and lack of family interaction) and adequate preparation for a pandemic (preparation for COVID-19, pandemic restrictions, health protocol compliance). Strategies and coping included comfort and convenience (living conditions, independent living), adapting to new normal (coping mechanisms, strategies; exploration), and family safety. Psychological outcome included the emotional impact (fear, anxiety).
Conclusion The nurses and nursing aides had both negative and positive experiences, with different outcomes depending on the participant. Most of the experiences were positive, thus the investigators concluded that a change in the participants' current lives has led to a voluntary decision to be separated from their loved ones while still being happy and content because of the assurance that their families were safe at home.

Key words: COVID-19, lived experiences of stay-in nurses and nursing aides

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Healthcare workers play an important role during the COVID-19 pandemic.[1] They are the ones exposed to the virus while dealing with all kinds of clients. Since a person with the disease may be symptomatic or asymptomatic, healthcare workers and staff are required to don personal protective equipment. Local health workers have not yet experienced a health crisis of this magnitude until now, which is why the researchers aimed to discover

their experiences and how these experiences affected them. The researchers wanted to find out the impact of the pandemic crisis on the physical, psychological and emotional aspects of both nurses and nursing aides, since they are the ones who committed their time to fully serve their patients while staying in the hospital's provided facilities. This research aimed to determine the experiences of stay-in nurses and nursing aides.

Methods

The researchers conducted a qualitative interpretative phenomenological study, focused on describing the individual nurse's and nursing aide's lived experiences as stay-in personnel in a private hospital in Quezon City catering to COVID-19 patients.[2-4] Staff nurses and nursing aides living in dormitories provided by the hospital during the pandemic were recruited through email or Messenger by purposive sampling. There were no limitations in terms of the marital status, having children and status of family/relatives at home. Staff who developed COVID-19 at the time of the interview and those with clear panic tendencies were excluded. Participants who failed to attend the online orientation; who failed to submit the ICF with e-signature, name, and date on the given deadline; and/or exhibited distress, needed a debriefing, and psychological first aid during the interview were withdrawn from the study. The latter were referred to the guidance counselor. The sample size was considered to be attained when data from the interviews showed saturation.

Qualified personnel who agreed to join the study were invited to an online orientation where the purpose of the study and the informed consent were discussed. Those who gave their informed consent were interviewed virtually via Google Meet using a semi-structured questionnaire revolving around two broad topics: their lived experiences as stay-in nurses and nursing aides during the pandemic, and the effects of the pandemic on them. The interview included questions about their experiences staying in the hospital during the pandemic, their thoughts, emotions, and feelings regarding their experiences at that moment, and the reason behind the decision to stay in the dormitory. Questions on how the pandemic affected their well-being were asked. The interviews were conducted with the research adviser present;

all interviews were recorded. Responses from the interviews were coded and categorized into themes. Thematic narrative analysis was performed to identify the themes and patterns from the data collected.[5] The process utilized the following stages:

Stage One: The researchers classified and prepared the collected raw data from the recorded interview and transcribed it into in-text documents. Significant statements from the organized data were highlighted as relevant with their experiences and used for data analysis.

Stage Two: The researchers manually assigned codes based to the research questions together with significant statements while carefully rereading them to ensure the relevance of the data being classified to the study. Statements with no connection were excluded.

Stage Three: The researchers formulated categories for the organization and classification of the generated codes from the data collected using tables. All codes that were classified were based solely on the topic and were not anticipated at the beginning of the study. From the formulated categories, the researchers searched for potential themes.

Stage Four: The researchers created descriptions of the clusters developed and reviewed the potential themes. In the first level of this phase, the researchers identified large themes and small themes from the reviewed descriptions. The researchers formulated a thematic map that showed the meanings evident in the data set as a whole.

Stage Five: The researchers defined the themes and presented them in a qualitative narrative. A narrative passage finding was utilized for narrative analysis in discussing interconnecting themes.

Stage Six: The researchers produced a written composition by selecting and extracting vivid examples. These were then related with the research questions and literature to produce a narrative analysis about the lived experiences of the stay-in staff nurses and nursing aides.

The study was approved by the Ethics Review Committee of the institution.

Results

There were six participants, five of whom were female, aged 23 to 31 years, with a mean age of 27.5 years. Half of the participants were nurses.

The three themes derived were: impact of a pandemic, strategies and coping, and psychological outcome for the three interview questions. Impact of a pandemic included isolation from the family (loneliness/sadness and lack of family interaction) and adequate preparation for a pandemic (preparation for COVID-19, pandemic restrictions, health protocol compliance). Strategies and coping included comfort and convenience (living conditions, independent living), adapting to a new normal (coping mechanisms, strategies; exploration), and family safety. Psychological outcome included the emotional impact (fear, anxiety). The results are summarized in Figure 1.

I. Impact of a Pandemic

According to the participants, the pandemic had an impact not just on their family relationships, but also on their daily work experiences. When asked the question about their experience during the COVID-19 pandemic in a private hospital, there was a unified answer among the participants. The following are excerpts from the interview that best clarify this:

"Nalulungkot ako kasi syempre malayo sa family tapos yung kapatid ko pa parang walang gagabay sa kanya. Almost 8 months ata kasi akong nakahiwalay sa kanila nun kaya malungkot parang naging independent talaga ako mabuhay sa sarili ko non kasi parang kanya kanyang galaw." [P6-Q11]

"Medyo malungkot pero wala tayong choice pero mas malungkot naman kung sila yung maaapektuhan, halimbawa di ba nasa hospital ako tapos ako pa magdadala na hindi pa namin masabi, mas malungkot naman yung ganun." [P3-Q9]

All six participants mentioned that their experience of personal isolation from their family was mainly due to their family members. When asked about the exact situation or scenario that influenced their perceptions of the phenomenon, the participants gave various, but nonetheless, similar, responses.

A. Isolation from Family

Isolation from family was characterized by the absence of physical contact or minimal interaction as well as having to live apart from them.
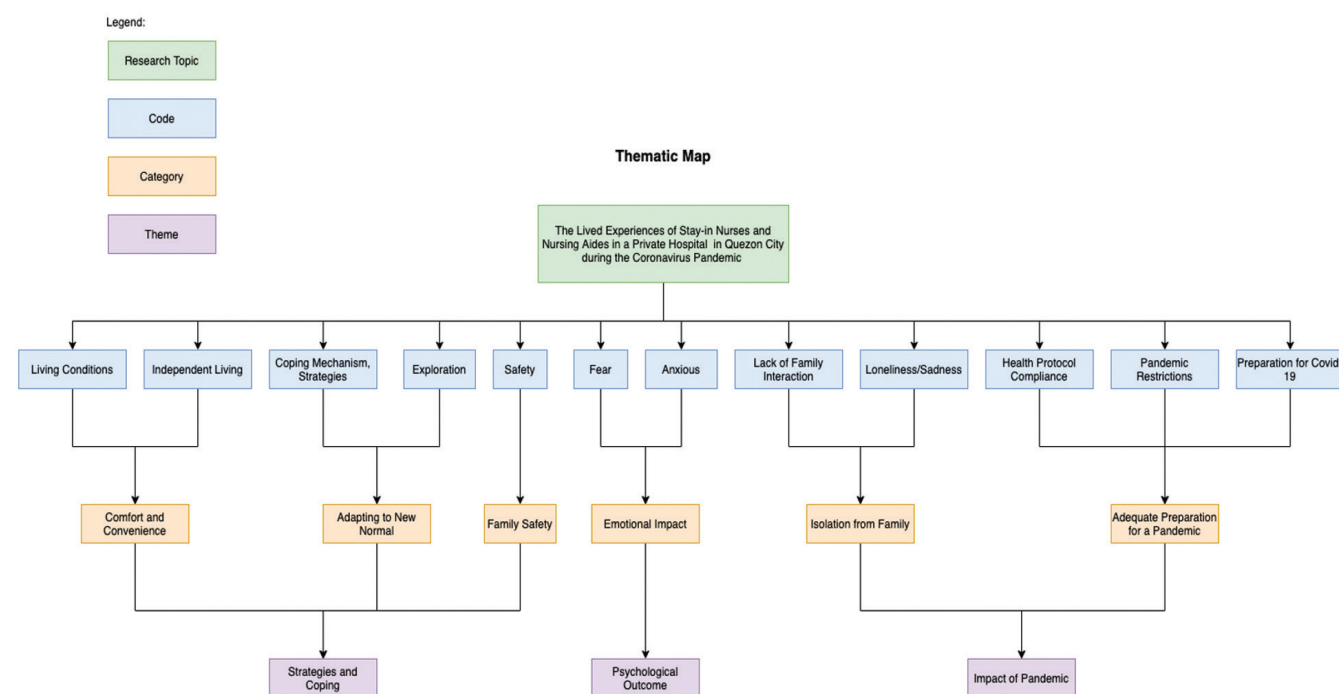

Figure 1. Thematic map of results.

1. Lack of Family Interaction

Two participants mentioned that the pandemic affected their interaction with their families:

"Ahmmm, siguro mas masabi na parang homesick sa anak." [P4-Q14]

"Nalulungkot ako kasi syempre malayo sa family tapos yung kapatid ko pa parang walang gagabay sa kanya. Almost 8 months ata kasi akong nakahiwalay sa kanila nun kaya malungkot parang naging independent talaga ako mabuhay sa sarili ko non kasi parang kanya kanyang galaw." [P6-Q11]

2. Loneliness

Four participants emphasized that being away from their families resulted in them feeling lonely, which made some of their experiences negative.

"Opo, kaso po malayo, ahmmm, siguro mas masabi na parang homesick sa anak, na hindi, apat na po siya nung January." [P4-Q14]

"Parang syempre yung sa isip ko nun parang parang wala lang parang at least kahit papaano nakabawas ako sa isipin ng magulang ko na kasi syempre may fear sila nang nalipat ako sa covid area, tapos kumbaga nalulungkot ako kasi syempre malayo sa family tapos yung kapatid ko pa parang walang gagabay sa kanya. Almost 8 months ata kasi akong nakahiwalay sa kanila nun kaya malungkot parang naging independent talaga ako mabuhay sa sarili ko non kasi parang kanya kanyang galaw." [P5 & 6-Q11]

"Medyo malungkot pero wala tayong choice pero mas malungkot naman kung sila yung maaapektuhan, halimbawa di ba nasa hospital ako tapos ako pa magdadala na hindi pa namin masabi, mas malungkot naman yung ganun." [P3-Q9]

B. Adequate Preparation for a Pandemic

1. Health Protocol

Health protocols on social distancing and frequent handwashing were implemented to prevent the spread of the virus. Five participants mentioned the importance of health protocols.

"Ah yes po, nakakauwi naman po every off or pagka alam po namin after magpaswab okay kami ganun po." [P1-Q10]

"Pag alam po naming may exposure agad, di po kami umuuwi kahit ako personally pag alam kong may exposure or yung kasama ko sa ward nagkaroon…" [P1-Q11]

"Ang protocol po kasi pag walang symptoms hindi iququarantine, yun po yung sa amin. Pumapasok pa din po kami. Kasi exposed na lang po kami pero walang symptoms, di din po kami swinaswab, upon waiting na lang ng may symptoms, quarantine - ganun po." [P1-Q16]

"Kami naman, Ma'am, mag-aadjust na lang din po kami if ever na kung sakali nga na may nagkaroon ng isa, ano na next na po gagawin…" [P1-Q17]

"Nag decide ako na umpisa pa lang na hindi nga po ako uuwi para safe din sa bahay na din, yun na naging desisiyon ko. Tapos ayun, yun na." [P1-Q21]

"Pag hindi siya, pag double off ganun, pag hindi naman mahirap yung sched." [P3-Q17]

"Kasi may PPE na tayong ginagamit, so mas safe tayo kung alam na nating may COVID siya." [P4-Q3]

"Kasi ikaw yung pwedeng maging carrier parang kumbaga cargo mo pa pag magkakaroon pa sila ng sakit madadamay sila kaya tinanggap ko na lang yung opportunity na dun kami mag stay." [P5 & 6-Q4]

"Yes, Ma'am, less na Ma'am kase nakadalawang positive na rin ako, naka dalawang positive…" [P5 & 6-Q10]

"Nag positive ako yung una kong positive nag home quarantine ako…" [P5 & 6-Q14]

2. Pandemic Restriction

The nurses and nursing aides said that sets of restrictions were being implemented in the hospital during and after their duty. Four respondents shared that they must follow the restrictions for the safety of their loved ones.

"Ahmm, hindi din ganun kabigat kasi nakakakuwi naman ako at nakikita ko at mas okay sakin nakikita kong mas okay sila kesa yung may sakit na patient katulad ng nakikita namin sa mga hinahandle namin patient ganun kasi sobrang hirap nung makita lalo na sa hindi mo relative hirap na hirap sila, pano pa kapag relative mo, mas okay na sakin." [P1- Q27]

"Hmmm, malapit lang, nagdecide lang talaga ako kasi di pwedeng may hindi pwede mag stay sa bahay merong immunocompromised ganyan, may pregnant din nung time na yun, ayun." [P1-Q29]

"Kuya ko po at dalawa ko pong pamangkin, 11 months and 4 years old. Mahirap po talaga kung sakaling umuuwi uwi dun." [P4-Q4]

"Ahmm, opo, hindi lang po para sakin, kundi para na din pati na din sa mga pamangkin ko kasi if ever na halimbawa last February nagka-COVID positive ako so kung umuuwi uwi ako doon possible na mahawa din sila, eh mga bata pa iyon, so 11 months and 4 years old, so iyon dito mas maigi na nandito kasi malapit ka lang if ever kukunin ka, kumbaga, uhm tawag doon? Kumbaga maano din sila kasi isaswab test din sila if ever na uhmm anong tawag doon baka, if ever na mahahawa ko sila ganun every thrice pa iyon" [P4-Q8]

"Siya po umuuwi madame tapos ako po parang once a week lang pero dun lang po ko sa labas ng bahay bisita lang." [P5 & 6-Q6]

3. Preparation for COVID-19

One respondent shared what the experience in the preparation stage of the hospital.

"Una napaisip, kung paano ang gagawin at ayaw namin ma-exposed…" [P1-Q3]

"Una sa 4-East nagkaroon ng cases nang parang dun lang namin nakita na medyo hindi pa kaya. Nung tumagal, nagset na sila na i-open na nila yung ODR para maging COVID ER, so doon unti-unting nabuo yung mga kailangan ng UERM, kaya parang na peace of mind naman ako na maprovide nila yung equipments na kailangan namin para di rin kami mahawa. Kaya pinush parin namin iyon. Kasi since sinara nga nila yung ward namin, half nun wala kaming choice. Kami yung naging pioneer nung COVID ER noong time na iyon." [P1-Q4]

II. Strategies and Coping

A. Comfort and Convenience

1. Independent Living

Nurses and nursing aides had to live independently when they stayed in the facility of the hospital.

All the participants responded that the hospital administration provided the utmost comfort and convenience to them.

"Sobrang well provide naman din, kasi syempre aircon nga dito…" [P1-Q7]

"Parang safe din sa amin at convenient nga at duduty kami sa baba lang then aakyat kami para magpahinga, ganun lang." [P1-Q24]

"Komportable naman po kami dito." [P2-Q8]

"Okay siya, feel ko bahay ko siya, free, komportableng-komportable." [P4-Q7]

"Masaya naman, maayos naman kasi yung quarters na inoffer ng RM, comfortable naman and yun nga may parang community pantry din na prinovide." [P5 & 6-Q13]

"Sobrang convenient malapit sa hospital, pag nag-oovertime kami hindi namin iisipin yung biyahe yung ganyan, tsaka yung uuwi nga kami ng may sakit or if ever na may sakit, hindi kami nag-iisip ng ibang makakahawa sa family ganun." [P1-Q7]

"Okay naman kasi dito binigyan kami ng kaalinawan, pag galing sa work di masyadong hassle, tapos makakatulog ka agad, yes po." [P3-Q11]

"Yung sa travel po kasi malayo, thanks God na lang may facility katulad nito free, malapit lang sa hospital…" [P4-Q5]

"Maganda dito, libre dito, malapit lang sa hospital, walking distance lang, di ka hassle, walang traffic, traffic ka lang sa stoplight." [P4-Q6]

"Para hindi rin hassle kasi lagi akong night shift…" [P5 & 6 Q4]

"Actually po nandito po kasi ako dahil malayo po samin, sa Parañaque po kasi ako, yung sa travel po kasi malayo…" [P4-Q5]

"Kasi na-provide naman ng RM yung needs. Kumbaga parang nag donate sila ng mga washing machine, may parang community pantry rin dun kaya ayun kumportable naman." [P5&6-Q16]

2. Living Conditions

The hospital administration provided facilities that would help nurses and nursing aides and for them to stay in during their duty to reduce the possibility of bringing the virus to their loved ones. Three respondents shared their stories during their stay at the quarters during and after duty.

"Kapag ka nasa tent kami natutulog kami minsan dito na kami kumakain, pero dadala na kami ng food, ganyan, pero naka open. Bukas naman siya ganyan." [P1-Q18]

"Masaya naman, maayos naman kasi yung quarters na inoffer ng RM, comfortable naman and yun nga may parang community pantry din na prinovide" [P5 & 6-Q13]

"Half kasi nung sa hospital kami nagsstay, nung una safe, okay naman nakakapagpahinga kami ng maayos, pero kapag may nagcocode naririnig din namin like minsan bago kami matulog may nagcocode sa gantong ward naririnig namin, sabi namin, meron na namang code ganyan, si patient ano to na hinandle natin, so parang, dun namin nakikita ulit, matutulog na lang kami naaalala ulit namin yung scenario sa ER." [P1-Q25]

"Nung nagsstay kami sa kabila, di rin kami makatulog ng maayos kasi naririnig namin yung paging, tapos nung nakalipat na kami sa school mas okay kasi di na namin naririnig yung nangyayari sa loob ng hospital." [P1-Q26]

"After duty naliligo kami nagwawash then wash din ng clothes din after duty. Ganun siya." [P1-Q20]

B. Adapting to the New Normal

1. Coping Mechanisms and Strategies

Five respondents shared that their way of adapting to the situation is through different coping techniques like praying, watching videos, relaxing, sharing their experiences with workmates and family members, and lastly, keeping a positive mindset amidst the pandemic.

"Ah yes po, mas narerelieve po, kasi nga po after every duty namin nagkwekwentuhan kami itong si ganito ganyan pero nakakatuwa at nakakalungkot naman din po siya parang ganun po, Ma'am." [P1- Q9]

"Para sakin masaya, kasi kung baga kung iinvite mo din naman yung lungkot na may COVID, parang ang pangit naman ng dating so imbis na maging malungkot ka maging masaya ka na lang tawanan mo na lang yung problema ganun" [P6-Q12]

"Through video call din minsan may mga cases din na nag video call kami, minsan personally sinusundo nila ako or hinahatid pagka okay naman." [P1-Q29]

"Umuuwi, mahirap din po pero okay lang tatanggap na lang po yung ano kailangan lang magpakatatag po." [P2-Q6]

"Yun po kailangan lang na manalangin ka lang, always pray, yun po, mag pray ka lang po palagi." [P2-Q7]

"Pero nag-aadjust ka pa po, pero nung ano tumatagal na po nagiging close na po kayo, nagiging okay na po, yes po masaya po." [P2-Q12]

"Nagpapahinga po, tas wala lang kain-kain lang." [P3- Q12]

"Nanunuod ako ng mga video ganun, para ma-relax relax din ganyan lang, tapos more on pahinga lang talaga." [P3-Q13]

"Pag uwi dito iba po yung nairerelease naming stress, pag uwi sa bahay half naman naikwekwento namin ano yung naexperience po namin, tapos, half non is masaya kami kasi okay kami po parang ganyan." [P1-Q12]

"Masaya kasi ito parang group of friends. Magkakasama kayo. Yung ka roommate mo, kavibe mo, kasama mo, para kayong nagreretreat everyday ganyan. Kung ano na-experience niyo sa loob na fefeel mo kung nasstress, malungkot nashshare mo dito." [P1-Q8]

"Ah, masaya naman kasi may mga mamemeet kang new friends…" [P3-Q10]

"Okay naman kasi ka-work ko rin naman yung kasama ko isa pa parang naging bonding na na lang namin yun pero syempre may fear baka magkahawaan ayun." [P6-Q15]

Since the pandemic may cause isolation, one participant was asked if they feel sad during the stay-in, and the participant stated that:

"Pag may kasama ako, hindi." [P3-Q14]

2. Exploration

One participant said that this is a new experience for them and said that:

"Tsaka mas naaexplore mo yung sa ibang lugar, mga experiences na di mo pa nattry dati, kasi ito first time ko lang din mag stay-in ng kasama yung ibang tao, eh." [P3-Q10]

C. Family Safety

As COVID-19 cases continued to rise, nurses and nursing aides feared becoming infected and infecting

their household members since they can be exposed during their duty.

1. Safety

The hospital prepared sleeping quarters in the hospital and the north campus for the healthcare workers if they decided to stay in. They mentioned that sleeping in the quarters is deemed beneficial since their families are safe and would not be affected. One participant shared the different scenarios when she is at home and when she is staying in the hospital.

> *"Alam namin na wala sila, wala okay sila safe sila walang sakit, unlike dito nakikita namin ang kwentuhan pa rin namin ay about patient na nawala si ganito, may ganitong case kami, tapos yung kwento nila buong family nila positive, dun lang namin nakikita yung difference po, kasi pag uwi naman din ang nakikita rin naman namin is yung reality na okay po sila, na nakikita ko."* [P1-Q14]

Additionally, other participants said that staying in the hospital quarters is beneficial since it is convenient for them and the safety of their family, when asked about the reason that they decided to stay in the hospital.

> *"Nakakagaan ng loob, kasi alam mo di ka uuwi, safe sila, safe sila sa bahay…"* [P1-Q8]

> *"Ahmm para sakin po ano, parang okay lang naman po kailangan mo lang po mag doble ingat po."* [P2-Q4]

> *"Mahirap po kasi mag commute, isang factor na din kasi yung sa pagcocommute tapos pangalawa na din yung sa safety rin nung nag-uuwian ko."* [P3-Q4]

> *"Yes naman, sobrang beneficial kasi example yung nag positive ako yung una kong positive nag home quarantine ako, pero syempre nandun yung fear na parang the moment na nag pacheck up ako sa ER at umuwi ako nung August 3, 2020 di na ko bumaba sa baba tsaka nakipag interact sa pagkain ganun nagkulong na lang ako sa kwarto kasi strict quarantine"* [P5-Q14]

As said by one of the nurses, self-protection measures are essential during their line of work to prevent COVID-19 infection and transmitting it to their loved ones:

> *"Minsan nagmamask kami kapag alam na namin na may exposure na kami sa labas tapos waiting na lang*

> *kami kung may symptoms kami or wala. Considered na safe pa din kami ganyan."* [P1-Q19]

III. Psychological Outcome

The unpredictable and high-risk situation led nursing aides to experience negative psychological outcomes such as fear and anxiety. Anxiety was brought about by various factors such as concern for the safety and health of others as well as the financial problems that arose. One participant specifically stated that fear of contracting the virus has been constantly present:

> *"Palaging may fear, Ma'am, hindi nawawala minsan nga hindi ka pa makatulog sa gabi, kasi tinatanong mo kung bukas ilang PUI nanaman yung makakaharap ko, mga ganun di siya nawawala, iniisip mo bukas may ICU ka naman o may COVID na naman."* [P5 & 6-Q10]

Emotional Impact

The COVID-19 pandemic has underlying emotional impacts among frontliners due to their work and daily experiences which inevitably led to fear and anxiety. The emotional impact was seen through concrete statements of participants in terms of the negative emotional impact brought by the pandemic specifically, their daily activity, work, condition, and experiences.

1. Anxiety

One of the psychological outcomes which was evident among nursing aides was anxiety as elaborated by two participants:

> "*Ano sa una parang ang hirap lang din pero yun ng, mas iisipin mo yung kapakanan ng iba kaya ayun.*" [P3-Q15] *Another participant was able to highlight how anxiety is caused by financial concerns: "Tsaka ano din mahirap yung pera, talagang true naman."* [P3-Q19]

2. Fear

Another outcome which was evident in the responses of the participants is fear. Participants commonly spole of the possibility of infecting family members and being extremely at risk of contracting the virus:

"Mas mabigat sa loob na madala mo yung sakit sa bahay parang ganun." [P1-Q6]

"So sa akin din po para sa safety ng pamangkin ko sa mga tao na nandun na hindi natin sila mahawa." [P4-Q10] "Pero nung narinig ko na may COVID, nandun yung fear na parang kung saka sakaling maging positive ako ang natatakot ako baka mahawa ko ang family ko, eh. Yes, kasi may kapatid po kong bata, eh." [P5 & 6-Q9]

"Ilalayo mo na lang yung sarili mo sa family mo, kasi ikaw yung pwedeng maging carrier kumbaga cargo mo pa pag magkakaroon pa sila ng sakit madadamay sila kaya tinanggap ko nalang yung opportunity na dun kami magstay." [P5 & P6-Q4]

"Okay sila safe sila walang sakit, unlike dito nakikita namin ang kwentuhan pa rin namin ay about patient na nawala sa ganito, may ganitong case kami, tapos yung kwento nila buong family nila positive, dun lang namin nakikita yung difference po, kasi pag-uwi naman din ang nakikita rin namin is yung reality na okay po sila, sa nakikita ko." [P1- Q14]

"Actually meron, naka encounter namin sa room di po talaga maiwasan, pero kapag nagkaroon ng cases, kami kami rin po ganito po naka tent kami…" [P1-Q15]

"Palaging may fear, Ma'am, hindi nawawala minsan nga hindi ka pa makatulog sa gabi, kasi tinatanong mo kung bukas ilang PUI nanaman yung makakaharap ko, mga ganun di siya nawawala, iniisip mo bukas may ICU ka naman o may COVID na naman." [P5 & 6-Q10]

"Siyempre nandun yung fear na mahawa ka dun sa virus, kasi kami, Emergency Room, eh, kami yung unang haharap sa patient." [P5 & 6-Q3]

Discussion

The results of this study were based on the aim of the investigators to explore the lived experiences of stay-in staff nurses and nursing aides in a private hospital during the COVID-19 pandemic. The investigators were able to delve into the conversation by asking simple questions about the participants' experiences of isolation as well as the unique context that influenced their experiences of the phenomenon. Through analysis of the gathered data, the researchers were able to establish the patterns and relationships between each major and significant key finding; resulting in the formation of three major themes.

Impact of a Pandemic

The results of the six participants who were affected by the COVID-19 pandemic's isolation from their families revealed that they had similar situations, consequences, and challenges in their daily lives. Separation from their families, being affected by pandemic protocols, and being concerned about their safety in the midst of the pandemic have all contributed to the change in their daily lives. The participants' responses were unanimous in indicating that their interactions with their loved ones as well as their usual activities before the pandemic had been affected. These are in line with UNICEF findings which revealed that healthcare workers sometimes feel alone and anxious during these difficult times.[6] Some of the healthcare workers stated that they sometimes wondered why they do what they do, that they are happy when a patient gets well, and that they tell the patient to keep their family close since they cannot do it with their own family. A nurse from the Philippine General Hospital shared that they can rest longer and more comfortably instead of traveling home every day.[7] With the current circumstances, healthcare workers need adequate accommodations that reduce the risk of spreading the virus to others while also providing a sense of security that reduces worry, stress, and fear. Furthermore, one participant stated, contrary to the majority of responses, that residing in a dormitory during a pandemic is delightful despite the current situation. As a result, while the positive effects outweighed the negative, it's important to keep in mind that nurses' and nursing aides' actual experiences throughout the pandemic may vary from person to person.

Strategies and Coping

The participants developed strategies and ways of coping, providing responses that showed convenience for them and ensured their safety from the consequences of COVID-19. The six participants clearly delivered their experiences highlighting the effectiveness of the strategy in providing comfort and convenience in their everyday life at their work as nurses and nursing aides. This shows how the

measures implemented by the hospital setting had significantly affected the participants' safety, mode of transportation, condition of living, comfort, and convenience. These results are in line with the experiences of nurses from other hospitals.[7] The six participants shared that they experienced comfort and convenience in the living quarters offered and made them at ease to find comfort and safety at the same time developed each individual's coping strategies and mechanisms.

The pandemic may cause heightened stress or trauma to the healthcare workers as they work at the frontline. The results show the participants are adapting well to the situation. They mentioned some of their coping strategies which they found to be effective. This indicates that they have good social support within their work environment and it significantly benefits the participants. One participant stated that this is a new experience for her since it is their first time staying in the hospital. Some of them found new friends during their stay-in and they talked about their experiences during their duty. These findings are congruent with the experience of a nurse in another hospital in Manila who stated that although it is a struggle risking their lives, they still try to look at the positive side.[6]

This is necessary since healthcare workers need to cope despite the challenges to be able to continue caring for patients during the COVID-19 pandemic. Four out of six participants shared that staying in the hospital quarters was beneficial since they were worried about their family's safety. It eased their minds knowing that their family was safe from getting infected. Some of them had children and vulnerable family members.

Psychological Outcome

The participants were able to experience the emotional impact of fear and anxiety caused by the COVID-19 pandemic. Anxiety was caused by the difficulty of being high risk in terms of contracting the virus and being the cause of infection among family members brought by the nature of work and the setting, similar to the findings in UNICEF Philippines stories, and Talabong and Tomacruz.[6,8] A nurse in a hospital in Manila elucidated that anxiety hit the hardest at the end of their shifts and that they felt alone at times with their own worries and concerns.[6] The participants emphasized how fear was a constant burden caused by health and safety concerns. The responses of the six participants indicated that their line of work and the COVID-19 pandemic specifically, the risk of being infected and being a carrier of the virus, especially for their families had a negative emotional impact on nursing aides.

The nurses and nursing aides had both negative and positive experiences, with different outcomes depending on the participant. Most of the experiences were positive, thus the investigators concluded that a change in the participants' current lives has led to a voluntary decision to be separated from their loved ones while still being happy and content because of the assurance that their families were safe at home.

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Risk factors of PTSD, depression and anxiety in patients with previous COVID-19 infection: A systematic review and meta-analysis

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Abstract

Introduction Studies showed that those who tested positive for COVID-19 have a 65% risk for a psychiatric disorder, while those undergoing isolation or quarantine are put at risk for anxiety and depression. The objective of this study was to appraise studies that determine the risk factors for psychiatric disorder post-COVID-19 infection.

Methods All cross-sectional and cohort studies from 2019 onwards that had COVID-19 survivors that developed anxiety, depression and/or post-traumatic stress disorder (PTSD), were included. Medline, Cochrane Library and ClinicalKey were searched using MeSH terms including "COVID-19", "depression", "anxiety", "post-traumatic stress disorder", and "risk factor". The risk of bias was assessed using the Newcastle-Ottawa scale. The data extracted from the studies were characteristics of the participants, risk factors, outcome measures and outcomes.

Results Four cohort and four cross-sectional studies involving 1438 COVID-19 survivors who developed depression, anxiety and/or depression were included. The risk factors that were statistically significant were 1) female sex (RR = 1.86; 95% CI 1.06, 2.04; Z = 2.32; p = 0.02) for depression, 2) having family members infected with COVID-19 (RR = 1.56; 95% CI 1.32, 1.85; Z= 5.17; p = <0.01) for depression, 3) steroid administration during hospital admission (RR = 1.62; 95% CI 1.07, 2.47; Z = 2.26; p = 0.02) for anxiety and 4) female sex (RR = 2.13; 95% CI 1.16, 3.91; Z = 2.45, p = 0.01) for PTSD.

Conclusion Female sex increases the risk of depression and PTSD. A family history of COVID-19 increases the risk of depression. Steroid administration is a risk factor for anxiety.

Key words: COVID-19, risk factors, depression, anxiety, post traumatic stress disorder

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The COVID-19 outbreak has claimed millions of lives worldwide and continues to infect the population. As of March 14, 2022, there have been 457 million cases reported with 6.04 million deaths. While there are numerous studies on mental health among healthy populations during the pandemic, data on mental health outcomes of individuals previously diagnosed with COVID-19 are limited. The effects of COVID-19 may last beyond the present infection

and have been implicated in the development of neuropsychiatric disorders such as depression, anxiety and post-traumatic stress disorder (PTSD) through direct viral infection of the central nervous system (CNS) or indirectly via an immune response.[1] Those who tested positive for COVID-19 have a 65% risk for a psychiatric disorder, while those undergoing isolation or quarantine are at risk for anxiety and depression.[2] In order to predict the patient's risk for having the aforementioned disorders, a number of studies from 2019 to 2021 looked into the prevalence, demographics, and predictors of psychiatric disorder in patients who had previous COVID-19 infections.[3-5] A literature search showed that no systematic review or meta-analysis regarding the risk factors or predictors of developing psychiatric disorders in patients with previous COVID-19 infection has been published.

Due to the increasing number of psychiatric cases reported after a COVID-19 infection, a meta-analysis will be a valid evidence-based guide for physicians that can help in predicting the onset of psychiatric disorders and providing appropriate management.[4] This study aimed to determine the risk factors associated with PTSD, depression and anxiety among patients with previous COVID-19 infection.

Methods

This meta-analysis and systematic review was done according to the guidelines set in the Cochrane Handbook for Systematic Reviews of Prognosis Studies and Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) checklist.[6,7] The studies were selected according to the study design, participants, risk factors or predictors, outcome, timing, setting and language. Case control, cohort, and cross-sectional studies reported in English from 2019 to the present were targeted research for this study. The studies must have participants with previously confirmed post-COVID-19 infection, and were screened for PTSD, anxiety and/or depression Studies which identified risk factors associated with psychiatric disorders post-COVID-19 infection were retrieved from August to October 2021 at Elsevier/Science Direct, Clinical Key, EBSCO, MEDLINE (PubMed), and CINAHL using the following medical subject headings (MeSH) terms: "COVID-19", "depression", "anxiety", "post-traumatic stress disorder", "risk factor", "determinant" and "predictor".

Using REVMAN 5.4.1, three author reviewers extracted the data from each eligible study. To ensure consistency across reviewers, the researchers conducted training exercises using the REVMAN training guide. Data that were collected from each study included the sociodemographic characteristics of the subjects and their clinical features. All reported outcomes including the effect size and the statistical analysis done for the outcomes were evaluated. Reviewers resolved disagreements through discussions. The three author reviewers were also the main authors who adjudicated unresolved disagreements. Study authors were contacted for any uncertainties. The authors extracted the number of participants who had depression, anxiety, PTSD, risk factors, outcome, and outcome measurement. Risk factor for the development of the aforestated disorders were collected.

The Newcastle-Ottawa Scales for Cohort and Cross-sectional Studies was used in assessing the risk of bias. The data set was encoded in RevMan 5.4.1 for analysis, while the Mantel Haenszel method was used to pool together the effect of individual data using risk ratios. A risk factor with a result of $p < 0.05$ was considered statistically significant. A risk ratio of > 1.00 is deemed as a positive outcome for a risk factor of a psychiatric disorder post-COVID-19 infection. Statistical heterogeneity was evaluated by chi-square and I^2 tests. The authors used an $I^2 > 75\%$ and a x^2 $p < 0.1$ as indicative of statistical heterogeneity. A random or fixed effects model was used for summary effect analysis depending on the statistical heterogeneity.[7-8]

Results

Study selection

A primary database search yielded 499 results from Elsevier, MEDLINE, CINAHL and Clinical Key; 16 additional studies were identified through other sources, for a total of 515 articles. Four hundred fifty-six articles were excluded due to irrelevance and duplication. From the remaining 59 full-text articles, 51 were excluded because they did not meet the eligibility criteria, leaving eight studies for this systematic review and meta-analysis (Figure 1).
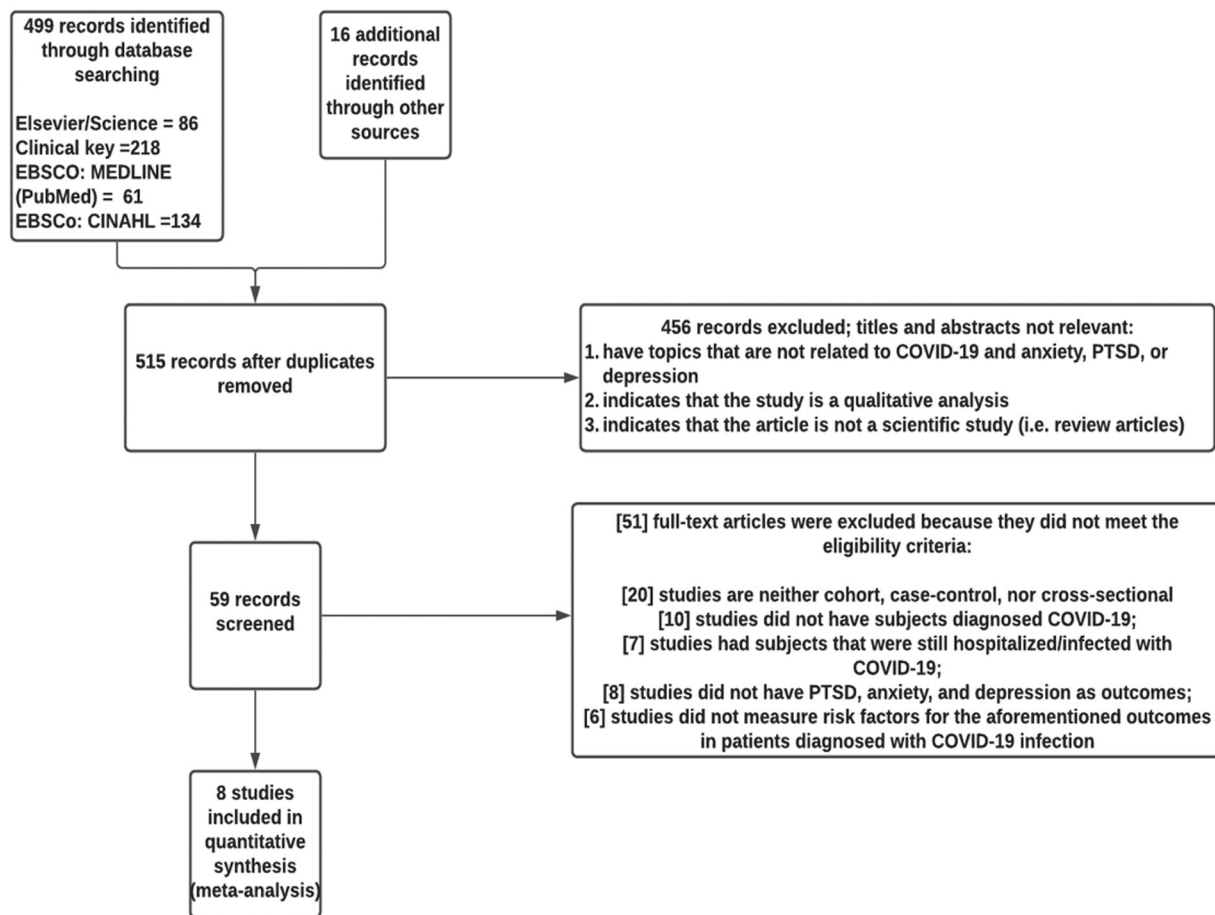
Figure 1. Study selection process.

Study Characteristics

The characteristics of the four cohort and four cross-sectional studies are summarized in Table 1.[9-6] Four articles had depression outcomes, three studies had anxiety outcomes, and seven studies had PTSD outcomes.[10-16] The eight studies had a total of 1438 participants of whom 115 participants had anxiety, 183 had depression, and 211 had PTSD. Risk factors identified in the studies were gender (6 studies); age (4 studies); marital status (3 studies); steroid administration (2 studies); educational status (3 studies); ICU hospitalization (2 studies); and a family member who was infected with COVID-19 (2 studies).

Risk of bias

The risk of bias for cohort and cross-sectional studies, respectively, was assessed using the Newcastle-Ottawa Quality Assessment Scale. The risk of bias was tabulated using the Risk of Bias Table in RevMan 5.4. Figures 2 to 5 show the summary of the risk of bias.

The criteria used in evaluating selection bias were 1) representativeness of exposed cohort, 2) selection of the non-exposed cohort, 3) ascertainment of exposure, and 4) demonstration that outcome of interest was not present at the start of the study. A study was considered low risk based on the first criterion if it included subjects who did not have an active COVID-19 infection (with serum levels that

Table 1. Study characteristics.

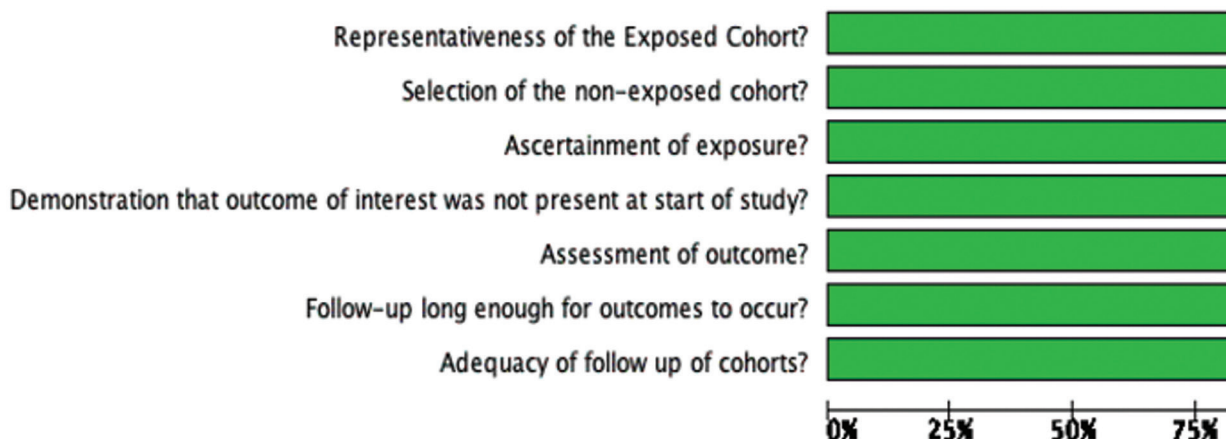| Reference	Methods	Participants	Number of Total Participants	Number of Participants w/ Anxiety	Number of Participants w/ Depression	Number of Participants w/ PTSD	Risk Factors	Outcome Measure	Outcome
Beck 2021	Cohort	Patients previously diagnosed with COVID-19 with confirmed by reverse transcriptase polymerase chain reaction from nasopharyngeal swabs, 18 y/o and above (mean: 58.2)	126	0	0	10	Married	Impact of Event Scale -revised (to German)	PTSD
Benzakour 2021	Cohort	Post-discharged patients diagnosed with COVID-19 infection, 18 years old and above (mean 56.8 (+/- SD 18-86 y/o)	109	17	20	15	Age, Gender, ICU hospitalization	Posttraumatic stress disorder checklist-5 (PCL-5), Hospital anxiety and depression scale (HADS)	PTSD, Depression, Anxiety
Cai 2020	Cohort	Post-discharged patients diagnosed with COVID-19 infection, 18 years old and above (mean ± SD: 45.7 ±14)	126	28	48	39	Older age, retirement, gender, social support, family members or close relatives infected, post-infection physical discomfort, educational status, history of psychiatric disorder	Post-traumatic stress disorder self-reating scale (PTSD-SS), Self-rating depression scale (SDS), Self-rating anxiety scale (SAS)	PTSD, Depression, Anxiety
Ju 2021	Cohort	Post-discharged patients diagnosed with COVID-19 infection, 18 years old and above (median 41, 31-53y/o)	114	0	0	41	Age, Gender, Marital Status, Edication, Clinical characteristics (Comorbidity, Duration of hospitalization,. severity of pneumonia, isolation site), Mental status during hospitalization	Impact of Event Scale-6 (IES-6)	PTSD
Chang 2020	Cross-sectional	discharged COVID-19 patients, 18 y/o and above (38-71; mean age=64.7	64	0	0	13	Female	Posttraumatic stress disroder checklist-5 (PCL-5)	PTSD
Imran 2021	Cross-sectional	previously hospitalized COVID-19 patients (23-60; mean age=40)	103	0	0	9	Steroid administration, Mechanical ventilator	Posttraumatic stress disorder checklist-5 (PCL-5)	PTSD
Liu 2020	Cross-sectional	Recovered COVID-19 patients who had been discharged from the hospital, 18 y/o and above (mean: 53.58)	675	70	103	84	Steroid administration; Female; Married; Higher Education; Family member infected with COVID-19; Family member died from COVID-19; Smoker	Generalized Anxiety Disorder Scale (GAD-7), Patient Health Questionnaire (PHQ-9, Posttraumatic stress disroder checklist-5 (PCL-5)	PTSD, Depression, Anxiety
Xu 2020	Cross-sectional	Post-discharged patients diagnosed with COVID-19 infection, 18 y/o and above (Mean ±SD: 41.72 ±13.61)	121	0	12	0	age, gender, ICU	Center for epidemiology scale for depression (CES-D)	Depression

Figure 2. Risk of bias graph for cohort studies

Figure 3. Risk of bias of individual cohort studies.

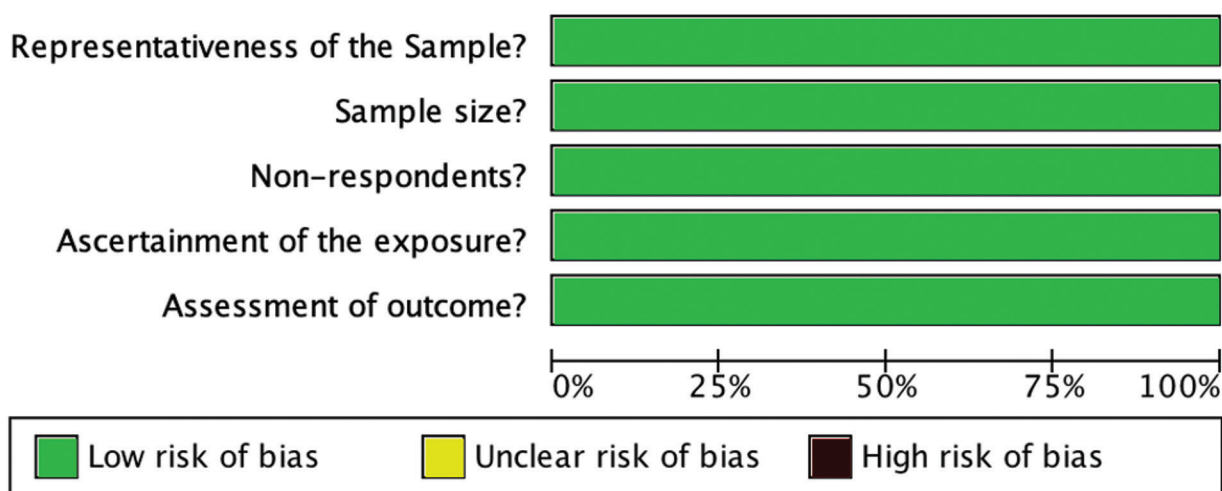**Figure 5.** Risk of bias of individual cross-sectional studies.

Figure 4. Risk of bias graph for cross-sectional studies.

were undetectable by RT-PCR). All the studies were low risk because they evaluated only patients who had undetectable COVID-19 by RT-PCR. A study was considered low risk based on the second criterion if all non-exposed subjects came from the same population as the exposed cohorts. All studies were low risk because the unexposed subjects also came from the same population as the exposed cohorts. A study was considered low risk based on the third criterion if validated questionnaires were used to determine the risk factors. All studies were considered low risk since validated questionnaires were used to measure the risk factors. A study was considered low risk based on the fourth criterion if the patients were screened during their hospital stay, supported by records that they did not show any symptoms of PTSD, anxiety, and/or depression. All studies were low risk based on this criterion. (See Figures 2 & 3)

The criteria used to assess outcome bias in cohort studies were: 1) assessment of outcome, 2) follow up long enough for outcomes to occur, and 3) adequacy of follow up of cohorts. A study was considered low risk if outcomes were measured using validated questionnaires, which was done in all included studies. All studies were considered low risk in terms of follow-up since they were conducted for a minimum of one month after the patients' discharge. For the adequacy of follow up to cohort, a study was considered low risk if the study stated the reasons for the loss to follow up. All the studies were considered low risk because descriptions of the loss to follow up were provided.

The criteria used for evaluating selection bias in cross-sectional studies were: 1) representativeness of the sample, 2) sample size, 3) non-respondents, and 4) ascertainment of the exposure. A study was considered low risk based on the first criterion if the subjects had serum levels that were not detectable by RT-PCR after their COVID-19 infection. All the studies were low risk because they only evaluated patients without detectable COVID-19 by RT-PCR swab tests. A study was low risk based on the second criterion if the sample size was satisfactory. All studies were low risk because they all had adequate sample sizes. A study was considered low risk based on the third criterion if the non-respondents were accounted for. All studies were considered low risk since all studies documented reasons for non-response. A study was considered low risk based on ascertainment of the exposure if the outcome was measured with a validated measuring tool. All studies were low risk based on this criterion. (See Figures 4 & 5)

Results of individual studies and synthesis of results

Individual studies tested several risk factors such as ICU stay, gender or sex, severity of COVID-19 infection, patient's knowledge of a relative infected with COVID-19, and post-discharge symptoms, however the pooled data suggested that not all were statistically significant or associated with psychiatric disorder development. Studies which assessed similar outcomes and risk factors were grouped and synthesized.

Depression Three studies showed a positive association between female sex and depression.[10,14,15,16] Females were 1.47 times more likely to have depression than males. Seventy-nine out of 469 (16.8%) females developed depression after COVID-19 infection, compared with 11.2% of males. The summary data showed a statistically significant effect ($Z = 2.32$, $p = 0.02$) as shown in Figure 6. Two studies showed that patients with family members also infected with COVID-19 were 1.56 times more likely to have depression than patients without infected family members.[11,15] Fifty-five percent of 229 patients with infected family members developed depression. The summary data showed a statistically significant association ($Z = 5.17$, $p < 0.001$) as shown in Figure 7. One study showed a positive but not statistically significant association between ventilator use and development of depression ($RR = 1.15$, $Z = 0.29$, $p = 0.77$). One study showed a positive association between ICU stay and depression ($RR = 2.29$), however the overall effect showed a negative association ($RR = 0.93$, $Z = 0.04$, $p = 0.97$).[15]

Anxiety Two studies showed a positive, statistically significant increased risk ($RR = 1.62$; 95% CI = 1.07, 2.47; $p = 0.02$) for developing anxiety in patients who were administered steroids as shown in Figure 8.[14,15] Three studies showed an increased risk of females developing anxiety that was not statistically significant ($RR = 1.14$; 95% CI = 0.77, 1.69; $p = 0.52$).[10,14,15] Three studies showed positive but not statistically significant ($RR = 1.20$; 95% CI = 0.68, 2.12; $p = 0.52$) increased risk for patients to develop anxiety after ICU admission.[14,15]

PTSD Seven studies showed a statistically significant increased risk for patients to develop PTSD

if they were female (RR = 2.13; 95% CI = 1.16, 3.91; p < 0.01), as shown in Figure 9).[9-15] Two studies showed a negative but statistically significant association between corticosteroid use during admission and PTSD (RR = 0.33; 95% CI = 0.15, 0.73; p = 0.006), as shown in Figure 10.[14,15] Three studies showed a positive but not statistically significant association between ICU admission and PTSD (RR = 1.29;

95% CI = 0.72, 2.31; p = 0.40).[9,10,14,15] Three studies showed a negative and statistically insignificant association between PTSD and use of a mechanical ventilator during admission (RR = 0.21, Z = 2.63; p = 0.65).[9,14,15] Three studies showed no association between being married and developing PTSD after COVID-19 infection (RR = 1.04; 95% CI = 0.96, 1.12; p = 0.36).[9,12,15]

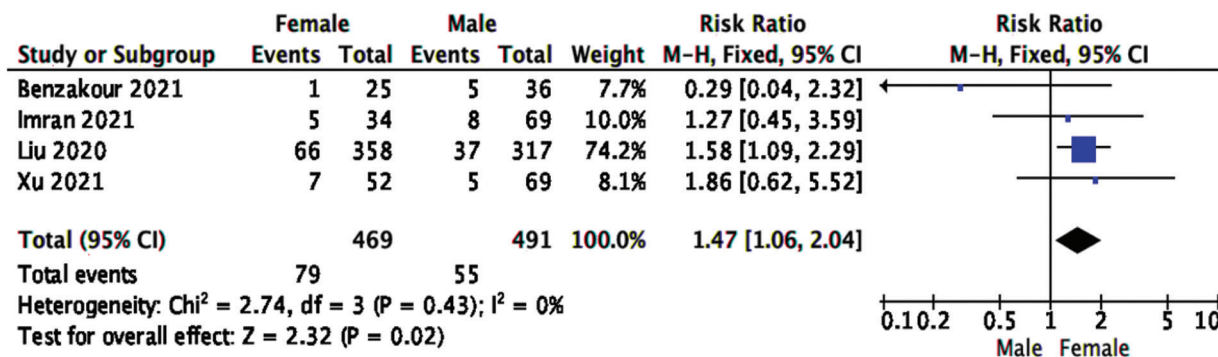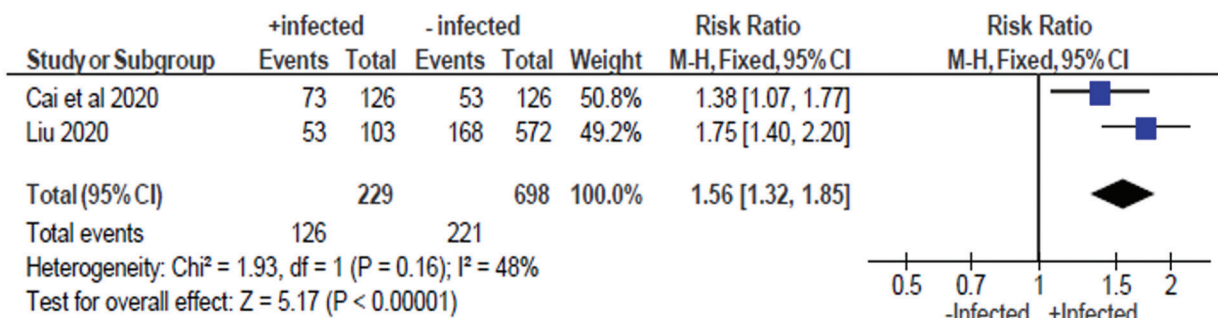**Figure 6.** Association between female sex and depression.

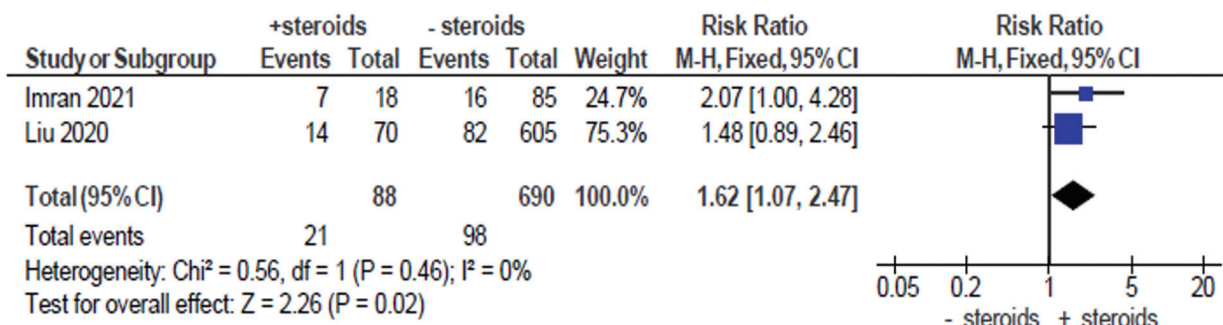**Figure 7.** Association between infected family member and depression.

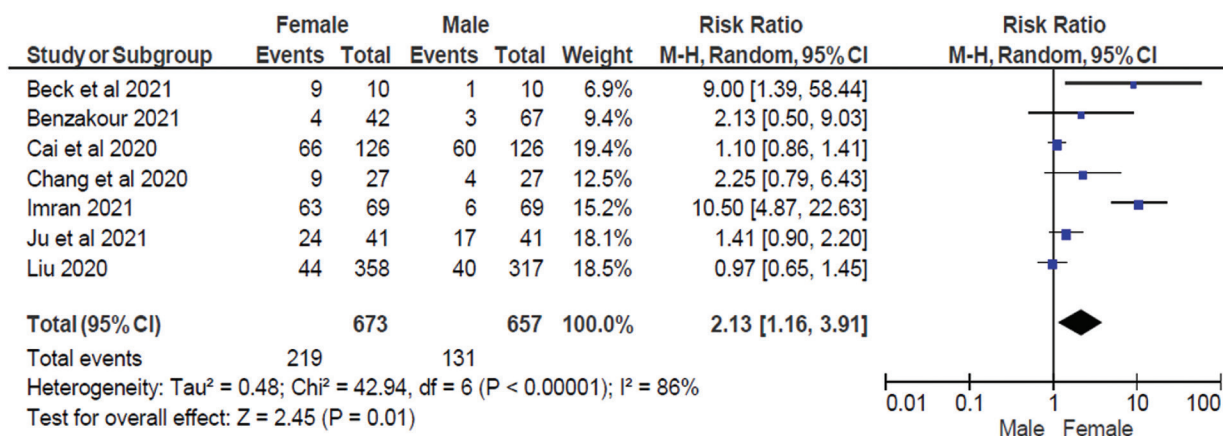**Figure 8.** Association between steroid administration and anxiety.

Figure 9. Association between female sex and PTSD.
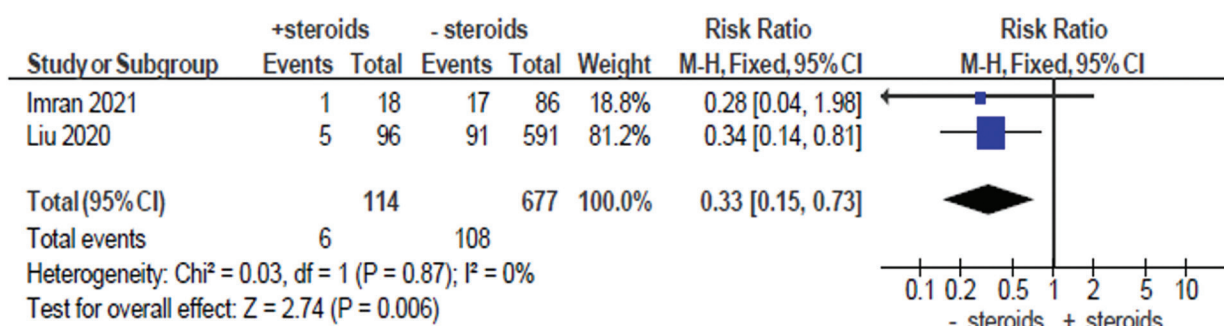

Figure 10. Association between steroid administration and PTSD.

Discussion

COVID-19 has affected not only the physical health of those infected, but their mental health and well-being as well. A rise in mental health problems among vulnerable groups has been observed, and it is important to be knowledgeable of predictive factors that may be used to screen them for psychiatric disorders.[17] The findings show that female sex and having one or more family members infected with COVID-19 were risk factors for depression; female sex for PTSD; and steroid administration during hospital admission for anxiety.

Female sex was determined as a risk factor for both depression and PTSD post-COVID-19 infection, supporting majority of the studies showing females suffering more psychiatric symptoms after COVID-19 infection. An increase in NF-κB inhibitor expression in females, due to an infection-triggered disturbance in the immune system, may play a part in the development of depression.[18] Differences in gender roles may also play a significant role in this. Participants who took on more traditionally feminine gender roles in their daily lives were less likely to experience emotional distress regardless of whether they were male or female.[19]

Having one or more family members previously or currently infected with COVID-19 was also identified as a risk factor for depression in COVID-19 survivors. That patients may have experienced guilt due to the possibility of being the source of infection, and an accompanying concern for the health status of the infected family member were proposed as explanations for the development of the psychiatric disorder.[11] The COVID-19 infection of the family member may also lead to his/her subsequent death, resulting in depression, stress and/or anxiety.[20]

Steroid administration was identified as a risk factor for anxiety. There is an association between corticosteroid administration and higher mortality in critically-ill patients.[15] Exposure to dexamethasone (6 mg/day) was also related to induced psychosis in patients.[21] One mechanism to explain this manifestation is the activation of the hypothalamic-pituitary adrenal axis, triggering a change in the production and regulation of neurotransmitters, such as a decrease in serotonin and increase in dopamine activity in the brain, leading to psychotic, mood or anxiety disorders.[21]

Risk factors that had a positive association but were not statistically significant for depression include ventilator use, non-psychiatric comorbidity, ICU admission, and steroid use. The risk factors for PTSD that had a positive association but were not statistically significant were psychiatric comorbidity, ICU admission, and marital status. Studies showed these as predictors for PTSD, however, their overall effects were not statistically significant. The risk factors for anxiety that were not statistically significant were female sex and ICU admission. Two studies identified female sex as a predictor for anxiety, however the overall effect was not statistically significant.[14,15] ICU admission was found to be a predictor in two studies, but the overall effect was not statistically significant.

A systematic review and meta-analysis of eight studies involving 1438 COVID-19 survivors showed that particular risk factors are associated in predicting depression, anxiety and/or PTSD: female sex and having one or more family members infected with COVID-19 are risk factors for depression; female sex, for PTSD; and steroid administration during hospital admission, for anxiety. Other risk factors assessed were positively associated with depression, anxiety and/or PTSD, but were not statistically significant.

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Hypertension as a prognostic factor in the prediction of mortality in patients with COVID-19: A systematic review and meta-analysis

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Abstract

Introduction Hypertension was identified by the CDC to be one of underlying medical conditions that might pose an increased risk for severe illness from COVID-19. This study aimed to determine the effect of hypertension on the morbidity of COVID-19 patients to help physicians in adjusting the management plans for a better prognosis.

Methods Participants included all COVID-19 patients with hypertension as a pre-existing medical condition. Studies were selected based study design, participants, exposure, outcome, timing, setting and language. MEDLINE and CINAHL, ScienceDirect, Clinical Key, OVID database, Wiley Online library, and UpToDate were searched. The risk of bias in selection, comparability and outcomes were evaluated. All information gathered were collated and evaluated using the Newcastle-Ottawa Quality Assessment Scale and CEBM.

Results There was a statistically significant positive association between mortality and hypertension as a prognostic factor (OR = 5.25, 95% CI 2.42, 11.40; HR = 2.21, 95% CI 1.75, 2.80). Individual studies all showed a significant relationship between hypertension and mortality in COVID-19 patients with OR ranging from 1.75 to 28.88, and HR of 1.49 to 3.32.

Conclusion Hypertension as a comorbid condition is a significant prognostic factor in the prediction of mortality in hospitalized COVID-19 patients.

Key words: COVID-19, hypertension, mortality, prognosis

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From December 2019 to the present, various countries have experienced a second and third wave of the COVID-19 pandemic. Although there have been almost 25 million recoveries, there have been at least one million deaths.[1] With the alarming increase in the number of cases and deaths worldwide, the possible risk factors should be determined to have a general idea of those who are more susceptible to develop COVID-19. Initially, only the old and

immunocompromised were identified to be at risk for more severe outcomes. However, as the months progressed, more studies revealed that people with other comorbidities were just as at risk. Hypertension was identified by the Centers for Disease Control and Prevention (CDC) to be one of underlying medical conditions that might pose an increased risk for severe illness from COVID-19.[2] This study aimed to determine the effect of hypertension on the morbidity of COVID-19 patients to help physicians in adjusting the management plans for a better prognosis.

Methods

This meta-analysis was done according to the fundamentals laid in the Cochrane Handbook for Systematic Reviews of Interventions and as stated by the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) statement.[3] Studies were selected based on study design, participants, exposure, outcome, timing, setting and language. Only case control and cohort studies reported in English from 2019 onwards were included. Participants included all patients admitted in hospitals who were diagnosed with COVID-19 and had hypertension as their pre-existing medical condition. The association between patient mortality or death rate and hypertension was the main outcome for this research.

MEDLINE and CINAHL using the EBSCO search engine, ScienceDirect using the Elsevier network, Clinical Key, OVID database, Wiley Online library, and UpToDate were searched from June to August 2020 for case control and cohort studies. The search strategies used Medical Subject Headings (MeSH) terms like COVID-19, comorbidities, hypertension, and mortality. Twelve authors independently screened the titles and the abstracts yielded by the search against the inclusion criteria gathered. Full reports were obtained for all the titles that met the inclusion criteria or where there was any uncertainty. Review author pairs then screened the full text reports if the initial screening suggested that they may be suitable for inclusion in the final meta-analysis. Figure 1 shows the reasons for exclusion at the level of full-text review. Any discrepancies among the reviewers were thoroughly discussed and subsequently resolved.

Data from the studies were extracted independently using standardized forms and a detailed instruction manual specific for RevMan.[4] Critical appraisal of each article was done using the Centre for Evidence Based Medicine Critical Appraisal tool for prognosis.[5] Variables extracted were socio-demographic, clinical characteristics and total number of the participants. The number of participants with hypertension, mortality-related outcomes, the effect size and statistical analysis utilized in each study were also extracted.
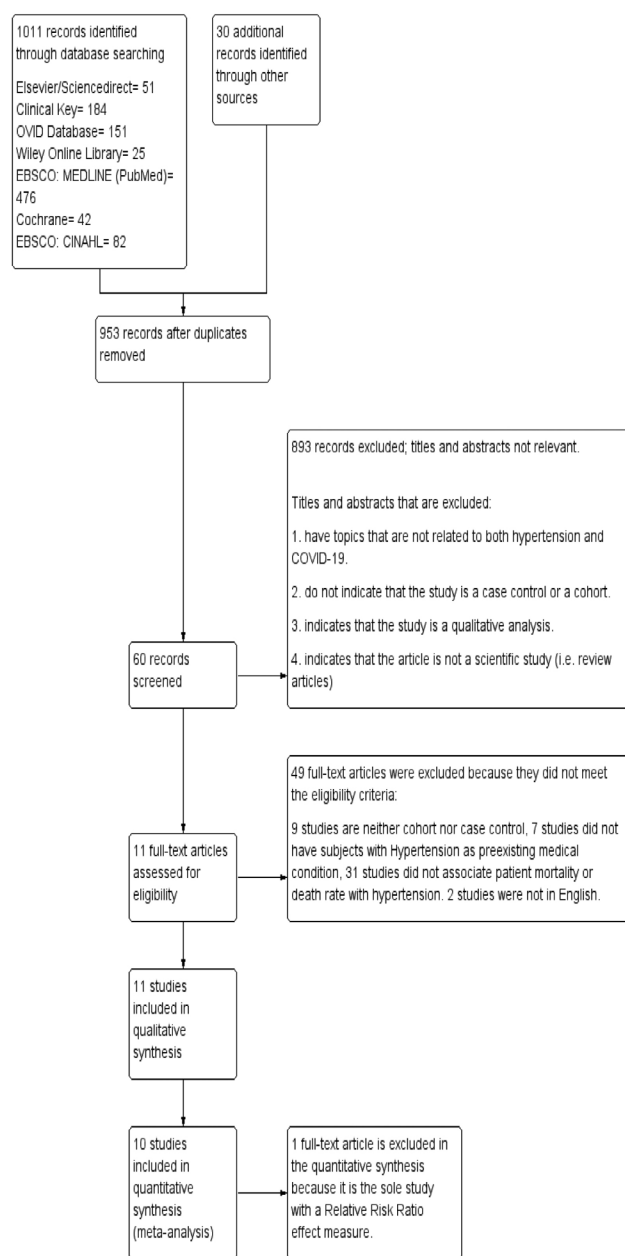

Figure 1. Flowchart of study selection

The risk of bias of each article was determined using the Newcastle-Ottawa scale and Centre for Evidence Based Medicine (CEBM) Critical Appraisal tools.[5,6] The chosen domains for risk evaluation were selection bias, comparability bias and outcome bias. To standardize the assessment process among evaluators, guide questions regarding the selection of patients, definition and determination of non-exposed cohort, cases and controls, handling of confounding variables and assessment of outcome or exposure were set. Features describing low, high and unclear risk were established as criteria for judging each study across the three bias domains.

The odds ratio for death was computed for each case control study using two-by-two tables. For cohort studies, the hazard ratio was pooled together using generic inverse variance. The data set was encoded in REVMAN 5.4 for analysis. The Mantel-Haenszel method was used for pooling the effect of individual data using odds ratio while the generic inverse variance was used for data using hazard ratio. Statistical significance was set at p < 0.05 level together with the 95% confidence interval. An odds ratio and hazard ratio of > 1.00 was deemed as a positive outcome which would indicate an association of hypertension with increased risk of mortality in patients with COVID-19. Random or fixed effects model was determined by the statistical heterogeneity which was evaluated by chi-square and I-test. An I^2 value of 0 < 40% was considered as not significant, 30-60% is taken as moderate heterogeneity, 50-90% considered as substantial heterogeneity and 75-100% was considered as significant heterogeneity. The authors used an I^2 result of > 75% and a x^2 result with p < 0.01 as indicative of statistical heterogeneity.[7]

Results
The search of the databases listed yielded 1011 articles; 30 additional records were identified through other sources and references of above titles, leaving 953 articles after removal of duplicates. Eight hundred ninety-three records were excluded due to irrelevance of the titles and/or abstracts. Of the remaining 60 articles, 49 were excluded as they did not meet the eligibility criteria. Eleven full-text articles were assessed for relevance and included in qualitative synthesis and 10 studies were included for meta-analysis. One article was excluded because it reported relative risk instead of odds ratio.

Table 1 shows the type of study, participants, other co-morbidities, number of participants with and without hypertension, exposure, outcome, outcome measures, and effect size. Ten studies consisting of 6 concurrent cohort, 3 non-concurrent cohort, and 1 non-concurrent observational study were included. All studies defined their subjects as patients diagnosed with COVID-19, with or without hypertension. All studies used Kaplan-Meier curves to determine probability of patient survival and Cox proportional hazard regression models or univariable and multivariable models to determine associated risk factors with mortality and odds ratios, respectively. All studies defined hypertension as having a blood pressure of > 140 mm Hg systolic and > 90 mm Hg diastolic measured on two separate days. The ten studies involved 8,999 participants, of which 3,032 had hypertension. Each study showed a positive association (OR > 1) between hypertension and mortality.

The criteria used to determine selection bias were: 1) representativeness of cases or exposed cohort, 2) ascertainment of exposure (for cohort) or definition of control and cases (for case control), and 3) selection of the non-exposed cohort (cohort) or same methods of ascertainment of cases/controls. A study was considered low risk for the first criterion when the disease severity was a common point in the course of the disease. Half of the studies were high risk because the disease severity varied among subjects, some studies classified the disease severity as mild, moderate and severe while some studies categorized the disease as severe, not severe or critical. Ten percent of the studies were low risk and the rest had unclear risk because no description of the derivation of the cohort was provided. A study was considered low risk for the second criterion when all subjects were drawn from the same community as the exposed cohort. All studies were low risk because all subjects were derived from the same community or hospital. A study was considered low risk for the third criterion when there were secured records, structured interviews for cohorts or independent validation for case controls. All studies were considered low risk. The criterion for outcome bias was the presence of assessment of outcome for cohort studies or ascertainment of exposure for case control studies. All studies were considered low risk because in-hospital deaths were considered as the outcome. Figure 2 shows the summary of the risk of bias.

Table 1. Summary of article characteristics.

ARTICLE FILENAME	METHODS	PARTICIPANTS	OTHER COMORBIDITIES	NUMBER OF TOTAL PARTICIPANTS	NUMBER OF PARTICIPANTS W/ HTN	EXPOSURE	OUTCOME	OUTCOME MEASUREMENT	EFFECT SIZE
Ciceri, et al. 2020 (Italy)	Cohort study	COVID-19 patients, 18 y/o & above (56-75 y/o, median=65)	coronary artery disease, diabetes, COPD, CKD, cancer	410	203	Hypertension	Mortality where main causes were: refractory hypoxia, massive pulmonary thrombosis, and multiple organ failure; Still admitted; and discharged	Kaplan-Meier curves were used to estimate the probability of survival. To evaluate the association between patients characteristic and i-hospital death, univariable and multivariable models were calculated.	Hazard Ratio=2.6
Gao et al. 2020 (China)	Retrospective observational study	COVID-19 patients consecutively admitted, with mean ages of 55.38 (non-hypertensive) and 64.24 (hypertensive)	diabetes, stroke, angina, renal failure, previous revascularization, peripheral vascular disease, chronic heart failure, COPD, pneumonia, Obstructive sleep apnea, asthma, cancer, smoking, alcoholism	2877	850	Hypertension	All cause mortality of patients during hospitalization collected from patients' documented medical files; associated with higher risk for patients not under anti-hypertensive treatment	Survival was estimated by the Kaplan-Meier method. Variances in outcomes between exposure cohorts were assessed by the multivariable Cox proportional hazards model. Covariates in the multivariable model included age, sex, medical history of diabetes, insulin-treated diabetes, MI, treatment by percutaneous coronary intervention (PCI) or CABG, renal failure, chronic heart failure, asthma, COPD, and stroke. Cox proportionality assumptions were met in all models.	Hazard Ratio=2.06 P: 3.45
Pan et al. 2020 (China)	Retrospective cohort study	Covid-19 patients consecutively admitted (ages 60-75 when matched)	DM, CHD, arrhythmia, COPD, asthma, cerebrovascular disease, CKD, chronic liver disease, malignancy, organ transplant	996	256	Hypertension	Death extracted from electronic medical records; covid-19 patients with hypertension were associated with more severe secondary infections, cardiac and renal dysfunction, and depletion of CD8+ cells on admission	Kaplan-Meir curved wee used to compare the cumulative risk rate. Cox proportional hazard regression models were applied to determine the potential risk factors associated with all-cause mortality, and the results are reported as the hazard ratio and 95% CI	Hazard Ratio=2.24
Wang et al. 2020 (China)	Cohort study	Covid-19 patients over 60 years old (65-76 y/o, median=69)	hypertension, diabetes, cardiovascular disease, cerebrovascular disease, CKS, chronic liver disease, COPD, malignancy, autoimmune disease	339	138	Hypertension	survival/non-survival; shorter length of stay associated with deaths; dyspnea, comorbidities, COPD, and ARDS were strong predictors of death

cardiac injury was defined if the serum level of cardiac troponin I (cTn1)was above the 99th percentile upper reference limit
ARDS was defined according to the Berlin definition
Arrhythmia was defined as emerging premature beat, tachycardia, atrial fibrillation, and clinically significant bradycardia according to ECG or medical records; transient sinus tachycardia associated with fever was excluded
Cardiac insufficiency was defined when the serum level of NT-pro BNP exceeded the normal range and the presence of associated symptoms such as dyspnea, orthopnea, and pedal edema | Multivariate Cox regressions were subsequently performed for comorbidities and complications, in which "age" factor was added to correct the models and only variables with statistical significance in univariate analysis were included. all significance levels were computed for 2-tailed testing and the cutoff of significance was set at P<0.05 | Hazard Ratio=1.494 |
Yang et al. 2020 (China)	Cohort study	COvid-19 patients with mean ages of 49.93 (survivors) and 67.82 (non-survivors)	hypertension, t2dm, coronary heart disease, COPD	226	84	Hypertension	Survival/non-survival obtained by patient discharge record; non-survivors had significantly higher serum N counts and higher levels of CRP, AST, sCr, NUB, and D-dimer, and higher neutrophil to lymphocyte ratio; serum ALB levels and L counts of non-survivors were lower than those of survivors	Kaplan-Meier (K-M) method to evaluate the relationships between variables and outcome and Cox proportional-hazard model (CPHM) analysis to clarify the effects of each factor on outcome	Hazard Ratio=3.317
ARTICLE FILENAME	METHODS	PARTICIPANTS	OTHER COMORBIDITIES	NUMBER OF TOTAL PARTICIPANTS	NUMBER OF PARTICIPANTS W/ HTN	EXPOSURE	OUTCOME	OUTCOME MEASUREMENT	EFFECT SIZE
Borobia et al. 2020 (Spain)	Cohort	COVID-19 patients, 18 y/o & above (46-78 y/o, median=61)	CHD, DM, rheumatological disease, solid malignant disease, obesity, CKD, COPD, hematological malignant disease, asthma, liver disease, HIV infection	2226	920	Hypertension	Mortality increased with age (over 60% for patients over 80 years of age), abnormal laboratory findings such as elevated D-dimer, lymphopenia, procalcitonin, ferritin, ans CRP levels	Multivariate logistic regression model: for analysis of predictors of in-hospital death	Odds Ratio=1.105
Chilimuri, et al. 2020 (United States)	Retrospective Cohort Study	COVID-19 patients (19-97 y /o, median=63)	DM, CVD, CKD, HIV/AIDS, CLD	888	225	Hypertension	Mortality associated with older age, admission D-dimer levels > 1000 ng/mL, admission CRP levels > 200 mg/L, admission lymphopenia, microembolic disease	Univariable and multivariable regression to measure relation between risk factors and in-hospital mortality	Odds Ratio=U: 2.43 M: 1.46
Hu et al. 2020 (China)	Retrospective Cohort Study	COVID-19 patients (23-91 y/o, median=61)	Cirrhosis, DM, malignancy, cerebrovascular disease, COPD, CKD, CLD, CVD, digestive system disease, endocrine system disease, nervous system disease, respiratory system disease	323	105	Hypertension	Mortality/ Disease Progression or Survival/ Disease Improvement: Survival time defined as the interval from the date of admission to the date of death or discharge;	Kaplan-Meier method and Log-rank Test: for associated of risk factors with outcome Univariate and multivariate logistic regression models for OR	Odds Ratio=4.388
Salacup et al. 2020 (United States)	Cohort study	COVID-19 patients, (58-75 y/o, median=66)	COPD, asthma, HF, arterial fibrillation, liver cirrhosis, diabetes, CKD, coronary artery disease, hypertension, obesity	242	180	hypertension	Inpatient mortality: associated with higher baseline CRP, requirement of mechanical ventilation, vasopressor use, and continuous renal replacement therapy/hemodialysis (CRRT/HD)	Multivariate logistic regression: for association of inflammatory baseline markers with in-patient death	Odds Ratio=1.056
Xiong, et al. 2020 (China)	Cohort study	COVID-19 patients (32-53.5 y/o, median=43)	hypertension, DM, coronary artery disease, cerebrovascular disease, COPD	472	71	hypertension	Composite endpoint (admission to ICU, need for mechanical vent, or death)	Multivariate logistic regression model to determine OR and CI for covariates with the composite endpoint (admission to ICU, need for mechanical ventilation, or death)	Odds Ratio=2.82

Individual studies all showed a significant relationship between hypertension and mortality in COVID-19 patients. Odds ratios ranging from 1.75 to 28.88, and hazard ratios ranging from 1.49 to 3.32 were noted. Five case control studies were included, consisting of 4247 subjects, 1501 of whom were hypertensive. As shown in Figure 3, there was a significant positive association with an overall odds ratio of 5.25 (95% CI = 2.42, 11.40 p < 0. 001), indicating that hypertensive patients were five times more likely to die than patients who were not hypertensive. There was significant heterogeneity ($I^2 = 91\%$). As shown in Figure 4, five cohort studies had hazard ratios ranging from 1.49 to 3.32 with an overall significant positive association (HR = 2.21, 95% CI = 1.75, 2.80, p < 0.001). This means that the risk of mortality is two times higher for COVID-19 patients with hypertension compared to those without hypertension as a comorbid condition. Heterogeneity was minimal ($I^2 = 10\%$).
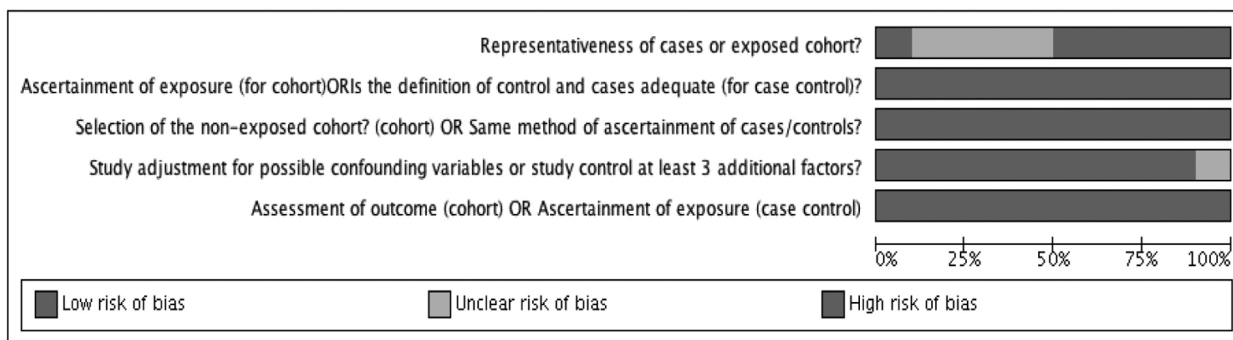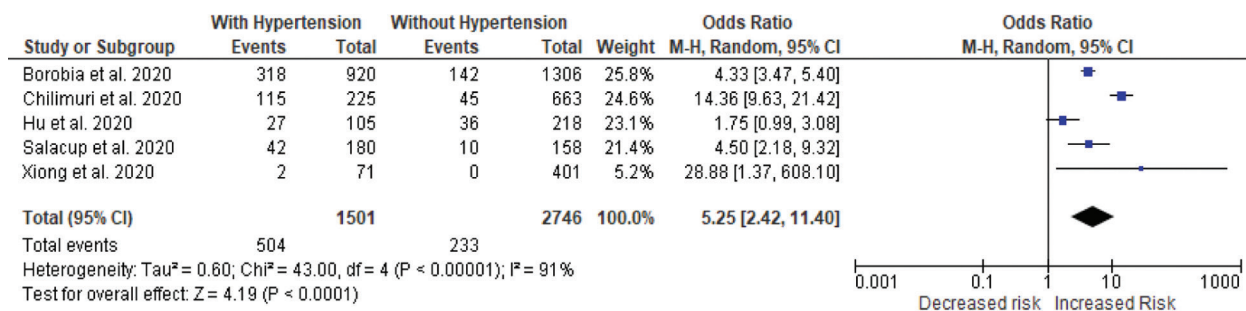

Figure 2. Risk of bias summary.

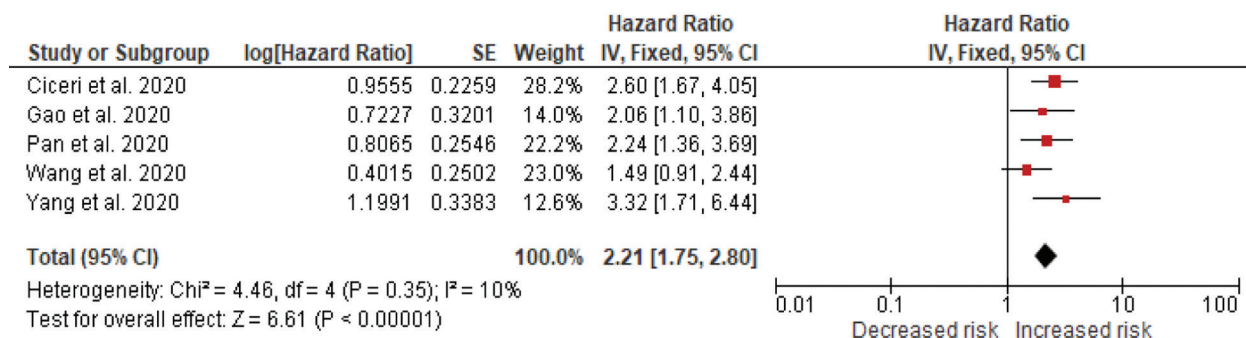**Figure 3.** Forest plot of the odds ratio of mortality with hypertension.

Figure 4. Forest plot of the hazard ratio of mortality with hypertension.

Discussion

Hypertension as a prognostic factor in the prediction of COVID-19 patients' mortality is still undergoing numerous studies as the number of cases continue to rise since it first made an appearance in Wuhan, China.[8] The aim of this meta-analysis was to determine the number of patients previously diagnosed with hypertension who tested positive for COVID-19, and to determine the number of deaths among COVID-19 patients with diagnosed hypertension in the included studies. The ten studies that were included evaluated the number of COVID-19 patients with hypertension and measured the outcome of mortality. The findings of five case control studies demonstrated a significant positive association with an overall odds ratio suggesting that the odds of mortality in COVID-19 patients with hypertension was five times higher. The five cohort also demonstrated a significant positive association suggests a two-fold increased risk of mortality in COVID-19 patients with hypertension.

Earlier studies on COVID-19 have shown how a comorbidity affects the severity of the disease progression. Patients will have different clinical profiles and underlying conditions making it difficult to point out whether the adverse effect of comorbidities came from the COVID-19-comorbidity interaction or from the pathological interactions between the patients' comorbidities.[9] Hypertension is one of the more common comorbidities among patients with COVID-19. However, previous studies have not been able to clearly delineate whether the poor outcomes were caused directly by the cardiovascular condition itself or by other comorbidities present. The typical patient profile of non-survivors includes older age and the presence of the following comorbidities - hypertension, diabetes mellitus (DM), chronic obstructive pulmonary disease (COPD), chronic kidney disease (CKD), coronary artery disease, and heart failure.[10] In patients with hypertension, there is a 2.5-fold higher risk of developing a severe disease or progressing to death from SARS-CoV-2 infection.[11]

However, other studies have reported that this 2.5-fold risk has a relatively weaker association compared to other comorbidities, such as the 5-fold higher risk in COPD and the 3-fold higher risk in CKD.[12,13] While mortality is predicted by age and the presence of comorbidities, hypertension and the use of anti-hypertensives did not significantly affect COVID-19 lethality.[9] These claims however do not disregard the fact that there is still a positive association between hypertension and the occurrence of poor outcomes. In another study involving 46,248 COVID-19 patients, the pooled OR of hypertension in severely-ill patients was 2.36 (95% CI = 1.46, 3.83) compared to non-severe patients, suggesting that hypertension is a risk factor for severity. It mentioned that hypertension was one of the acute respiratory distress syndrome (ARDS) predictors in patients with severe acute respiratory syndrome (SARS). However, the study also clarified that the role of hypertension in the progression of the illness was unclear but remained to be an important factor contributing to the mortality.[14]

The strength of this meta-analysis is that it comprises case control and cohort studies with a large sample size from different databases. The use of standardized methodology and validation of the systematic review using the PRISMA checklist allows for more reliable results. A limitation of this meta-analysis is the lack of age-adjusted data in relation to hypertension and disease severity. Since the mean age of all the patients found in this meta-analysis is 63, the results may be construed and attributed to the severity or progression of hypertension with advancing age.

The result of this meta-analysis shows that hypertension is a comorbid condition which has a prognostic significance in predicting mortality among patients hospitalized for COVID-19. Although there is inadequate explanation of the pathophysiology and its role in the disease progression, its significance as a contributory factor for poorer outcomes in hospitalized COVID-19 patients should not be disregarded.

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It is preferred that references and intext citations be in the National Library of Medicine (Vancouver) format, however, authors may choose to use the American Psychological Association (Harvard) format. The format selected by the authors should be used consistently throughout the manuscript.

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Francis D, Hadler SC, Thompson S, et al. The prevention of hepatitis B with vaccine: Report of the Centers for Disease Control multi-center efficacy trial among homosexual men. Ann Intern Med 1982; 97: 362-6.

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.

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Chapter in a book

Corbett S. Systemic Response to Injury and Metabolic Support. In: Brunicardi FC (editor). Schwartz's Principles of Surgery. 10th ed. New York: McGraw-Hill; 2015: 13-50.
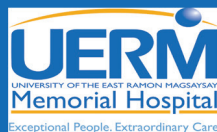
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arrow or encircled. When symbols, arrows, numbers, and letters are used to identify parts of illustrations, each one should be identified and explained in the legend. Photographs of persons must be retouched to make the subject unidentifiable when possible and be accompanied by written permission from the subject to use the photograph.

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