Vol. 12 No. 1 January - June 2023

UERM
Memorial Medical Center, Inc.
Research Institute for Health Sciences

Health Sciences Journal

ISSN 2244-4378 e-ISSN 2408-302X

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

The HEALTH SCIENCES JOURNAL

is published by the
University of the East Ramon Magsaysay Memorial Medical Center, Inc.
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Introduction Introduction: The Philippines tops globally for time spent on social media. This study aimed to explore the association between social media addiction, body image, and social comparison among young adult Filipino women aged 18-25 years old in Metro Manila.

Methods: The Social Media Addiction Scale (SMAS), Body Image Questionnaire (BIQ), and Iowa-Netherlands Comparison Orientation Measure (INCOM) were used to assess social media addiction, body image, and social comparison, respectively. PRR (CI 95%) assessed the association between SMA and BI, and SMA and SC.

Results:Majority of participants had social media addiction (91.11%), while most reported a neutral body image (87.64%). Additionally, more than half of the participants exhibited a high tendency towards social comparison (53.15%). The study found a positive association between social media addiction and negative body image, as well as a significant positive association between social media addiction and social comparison. Obesity showed a significant positive association with negative body image perception, while being overweight was significantly associated with a lower likelihood of having a positive body image. Spending at least 4 hours per day on social media was significantly associated with a higher tendency towards social comparison.

Conclusion: These findings suggest the presence of social media addiction among young adult Filipino women and its association with body image and social comparison. Awareness of these associations can contribute to the development of targeted interventions and educational programs to promote healthier social media use and positive body image among young adults.

Key words: Social media addiction, body image, social comparison

Social media has become a pervasive aspect of modern society, with an increasing number of individuals engaging in its use. In the Philippines, social media usage is particularly prevalent, with approximately 76 million Filipinos actively using social media, accounting for a significant 71% of the entire population. These users spend an average of 4 hours

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per day across various social media platforms. Notably, the largest group of social media users in the country falls within the 18-24 age range, and females exhibit higher participation rates than males on platforms such as Twitter, Snapchat, Instagram, and Facebook. Young Filipino women emerge as the primary users and consumers of social media, which serves as a modality for them to express their self-identity and social identity. However, the content shared on social media platforms can contribute to both negative and positive perceptions, particularly regarding body image and social comparison.[1]

Despite the widespread use of social media in the Philippines, there is a dearth of information regarding the association between social media addiction and body image and social comparison. Existing studies have independently examined these variables, but their interrelationships remain largely unexplored. Therefore, this research aimed to bridge this gap by investigating the association between social media addiction, body image, and social comparison among young adult Filipino women aged 18-25 years in Metro Manila.

This study aimed to contribute to the understanding of the intricate relationship between social media addiction, body image, and social comparison among young adult Filipino women in Metro Manila. The findings will shed light on the potential influences of social media on body image perceptions and social comparison tendencies, providing valuable insights for researchers, policymakers, and healthcare professionals. Additionally, the study explored the impact of confounding variables on these associations, enhancing one's understanding of the multifaceted nature of these phenomena.

Methods

This research employed an analytical cross-sectional study design to investigate the association between social media addiction, body image, and social comparison among young adult Filipino women aged 18 to 25 years living in Metro Manila. The participants were selected using non-probability convenience sampling. Data collection was conducted from June 16, 2021, to September 25, 2021.

The following measurement tools were utilized in the study: Social Media Addiction Scale (SMAS), Body Image Questionnaire (BIQ) and Social Comparison.

Social Media Addiction Scale (SMAS)

The 41-item SMAS, originally developed to detect social media addiction among university students aged 17 to 45 years old, was used to assess the level of social media addiction. Participants responded to items on a five-point Likert scale ranging from 1 ("Never") to 5 ("Always"). Higher scores indicated a higher degree of social media addiction. The manual for the SMAS categorized scores from 41 to 73 as "no addiction" and scores from 74 to 205 as "with addiction"[2]

Body Image Questionnaire (BIQ)

The 19-item BIQ was employed to evaluate participants' body image. Items were answered on a five-point Likert scale ranging from "Often" to "Very Much." The scoring of the BIQ involved categorizing items as favorable or unfavorable based on the BIQ manual. Favorable items (1, 6, 7, 9, 10, 12, 14, 16, and 18) were scored from 1 to 5, while unfavorable items (2, 3, 5, 8, 11, 13, 15, 17, and 19) were reverse-scored. Additionally, item 4 was reverse-scored specifically for female respondents. Total scores were classified as follows: 19 to 38 represented "negative body image," 39 to 75 represented "neutral body image," and 76 to 95 represented "positive body image".[3]

Social Comparison

Iowa-Netherlands Comparison Orientation Measure (INCOM): The 11-item INCOM was utilized to assess participants' tendency to engage in social comparison. Items were responded to on a five-point Likert scale ranging from "I disagree strongly" to "I agree strongly." Scores higher than the mean indicated a higher tendency toward social comparisons, while scores lower than the mean indicated a low tendency toward social comparisons. The INCOM demonstrated good internal consistency (α=0.83), with all 11 items yielding corrected item-total correlations greater than 0.36. Additionally, the measure showed criterion validity, as it exhibited correlations (r=0.33-0.48) with the tendency to socially compare.[4]

Data Analysis

The responses from each participant were encoded in a Google Spreadsheet and analyzed using IBM SPSS Statistics Software (Version 25). Descriptive statistics,

including frequencies, proportions, and mean scores on the SMAS, BIQ, and INCOM, were calculated. The prevalence rate ratio was employed to test the association between independent and dependent variables with a 95% confidence interval. Furthermore, associations between confounding variables (BMI, duration of social media use, frequency of social media use, average time spent on social media daily, and monthly income) and the dependent variables were examined. Inferential statistics, such as the Chi-square or Fisher's exact test, were used to assess the statistical significance of associations between dependent and independent variables. A p-value of less than 0.05 was considered statistically significant.

Ethical clearance for this study was obtained from the Ethics Review Committee (ERC) of the UERMMMCI Research Institute for Health Sciences (RIHS).

Results

A total of 461 participants took part in this research, consisting of females aged 18 to 25 years old. Participants who were currently pregnant and/or had medical conditions and/or disabilities were excluded.

Table 1 presents the demographic profile of the research participants. The mean age of the participants was 21.64 years (SD = 1.90). The majority of participants were single (98.7%) and college graduates (70.9%), while only 22.1% were employed. Among the employed participants, 20.6% reported earnings above the monthly minimum wage.

The BMI classification of the participants is summarized in Table 2. According to the WHO classification, the majority of participants (63.77%) had a normal body mass index.

Regarding social media use, the study found that the majority of participants reported having used social media for more than 6 years (93.9%). Additionally, nearly all participants (99.8%) reported using social media on a daily basis, indicating the pervasive and regular nature of their social media engagement. Furthermore, a significant proportion of participants (76.56%) reported spending more than 4 hours per day on social media platforms.

Messenger was identified as the most accessed social networking site, with a staggering 98.9% of participants using it. Facebook and YouTube followed closely, with 97.8% and 93.3% of participants accessing these platforms, respectively.

Table 1. Profile of participants.

Characteristics	Frequency	Percentage
Marital Status		
Single	455	98.7
Cohabitation	3	0.7
Married	2	0.4
Separated	1	0.2
Educational Attainment		
College	327	70.9
High School	93	20.2
Graduate School	41	8.9
Occupation		
Student	333	72.2
Working	102	22.1
Non-working	26	5.6
Income per month (in Php)		
Non-working	332	72.0
>16,000 (Above monthly minimum wage)	95	20.6
<16,000 (Below monthly minimum wage)	34	7.4

Table 2. Body mass index of participants.

Characteristics	Frequency	Percentage
BMI (kg/m^2)		
Underweight (<18.5)	62	13.5
Normal (18.5-24.9)	294	63.8
Overweight (25-29.9)	73	15.8
Obese (≥30)	32	6.9

The primary reasons for using social media were entertainment, as reported by 98.9% of participants, followed by keeping in touch with family and friends (97.6%), and finding information (82%).

The summary of participants' social media use is presented in Table 3.

Based on the results obtained from the Social Media Addiction Scale (SMAS), Table 4 illustrates that out of the 461 participants, a significant majority (91.11%) exhibited signs of social media addiction. Only a small number of participants (41 individuals) did not show indications of social media addiction.

Based on the findings derived from the Body Image Questionnaire (BIQ), it was observed that the majority of participants (87.64%) exhibited a neutral body image. In contrast, only a small number of participants

Table 3. Social media use of participants.

Characteristics	Frequency	Percentage
Duration of Social Media Use		
>6 years	433	93.9
4-6 years	28	6.1
Frequency of Social Media Use		
Daily	460	99.8
Weekly	1	0.2
Average Time Spent on Social Media Daily		
>4 hours	353	76.56
<4 hours	108	23.43
Social Networking Sites Used*		
Messenger	456	98.9
Facebook	451	97.8
YouTube	430	93.3
Instagram	424	92.0
Twitter	343	74.4
Discord	301	65.3
Telegram	241	52.3
Tiktok	234	50.8
Viber	203	44.0
Linkedin	113	24.5
Reddit	102	22.1
Whatsapp	55	11.9
Snapchat	40	8.7
Quora	15	3.3
Others	14	3.0
Purpose of Using Social Media*		
Entertainment	456	98.9
Keep in touch with family and friends	450	97.6
Find information	378	82.0
Social events	270	58.6
Make business and professional contact	180	39.1
Create media content and share opinion	175	38.0
Meeting new people	14	30.8

*Multiple response question

(6 individuals) were identified as having a negative body image. Table 5 offers a concise summary of the participants' body image assessments.

Table 6 displays the scores obtained from the Iowa-Netherlands Comparison Orientation Measure (INCOM). The results indicate that more than half of the participants (53.15%) demonstrated a high degree of social comparison tendencies.

Tables 7 and 8 present the findings related to the association between social media addiction and body image perceptions. Among participants with social media addiction, only 10.14% reported having a positive body image, while a mere 1.59% indicated a negative body image. In contrast, none of the participants without social media addiction reported a negative body image. Although there was a positive association between social media addiction and negative body image, the results were not statistically significant. However, a statistically significant negative association was observed between social media addiction and positive body image perception.

Furthermore, the study revealed a statistically significant positive association between social media addiction and social comparison tendencies. This suggests that individuals who exhibit addictive behaviors towards social media are more likely to engage in frequent social comparison with others.

In Table 10, among the confounding variables analyzed, only obesity exhibited a statistically significant positive association with negative body image perception. While there were positive associations between negative body image and using social media daily for 6 years and having an income below the minimum wage, these associations were not found to be statistically significant.

Table 4. Social media addiction among young adult women in Metro Manila.

Degree of Social Media Addiction	Frequency	Percentage	Mean SMA Score ± SD
With addiction	420	91.11%	114.05 ± 25.33
No addiction	41	8.89%	62.34 ± 7.57

Table 5. Body image perception of young adult women in Metro Manila.

Body Image	Frequency	Percentage	Mean BIQ Score ± SD
Neutral body image	404	87.64%	62.19 ± 7.64
Positive body image	51	11.06%	81.29 ± 4.18
Negative body image	6	1.30%	36.83 ± 1.94

Table 6. Degree of social comparison of young adult women in Metro Manila.

Degree of Social Comparison	Frequency	Percentage	Mean INCOM Score ± SD
High Social Comparison	245	53.15%	43.13 ± 4.78
Low Social Comparison	216	46.85%	31.10 ± 3.81

Table 7. Association of social media addiction and negative body image perception.

		Outcome (n,% within exposure)		PRR (95% CI)	p
		Negative Body Image	Neutral Body Image		
Exposure	With addiction	6 (1.59%)	372 (98.41%)	0	>0.9999
	Without addiction	0	32 (100%)		

Table 8. Association of social media addiction and positive body image perception.

		Outcome (n,% within exposure)		PRR (95% CI)	p
		Positive Body Image	Neutral Body Image		
Exposure	With addiction	42 (10.14%)	372 (89.86%)	0.462 (0.2426-0.8804)	0.022
	Without addiction	9 (21.95%)	32 (78.05%)		

Table 9. Association of social media addiction and social comparison.

		Outcome (n,% within exposure)		PRR (95% CI)	p
		High Social Comparison	Low Social Comparison		
Exposure	With addiction	236 (56.19%)	184 (43.81%)	2.560 (1.4285–4.5671)	<0.0001
	Without addiction	9 (21.95%)	32 (78.05%)		

Table 10. Association of confounders and negative body image.

Characteristics	Body Image		PRR (95% CI)	p
	Negative	Neutral		
BMI (kg/m^2)				
Normal (18.5-24.9)	2	252	1.000	
Underweight (<18.5)	0	57	0	>0.9999
Overweight (25-29.9)	1	69	1.814 (0.1669- 19.7187)	0.5194
Obese (≥30)	3	26	13.138 (2.2888- 75.4144)	0.0002
Duration of social media use				
>6 years	6	380	∞	>0.9999
4-6 years	0	24		
Frequency of social media use				
Daily	6	403	∞	>0.9999
Weekly	0	1		
Average Time Spent on Social Media Daily				
≥4 hours	5	314	1.426 (0.1688- 12.0553)	>0.9999
<4 hours	1	90		
Income per month (in Php)				
Below monthly minimum wage	2	27	∞	0.0703
Above monthly minimum wage	0	79		

Moving on to Table 11, a significant negative association was observed between being overweight and positive body image perception. This suggests that individuals who are overweight are less likely to have a positive body image.

In Table 12, no significant associations were found between the confounding variables and social comparison, except for the average time spent daily on social media. Women who spent at least 4 hours per day on social media were 1.44 times more likely to engage in social comparison behaviors.

Table 11. Association of confounders and positive body image.

Characteristics	Body Image		PRR (95% CI)	p
	Negative	Neutral		
BMI (kg/m^2)				
Normal (18.5-24.9)	40	252	1.000	
Underweight (<18.5)	5	57	0.589 (0.2421-1.4313)	0.2264
Overweight (25-29.9)	3	69	0.304 (0.0968-0.9554)	0.0242
Obese (≥30)	3	26	0.755 (0.2490-2.2903)	0.7797
Duration of Social Media Use				
>6 years	48	380	1.009 (0.3361-3.0313)	>0.9999
4-6 years	3	24		
Frequency of Social Media Use				
Daily	51	403	0.453 (0.0405-5.0623)	>0.9999
Weekly	0	1		
Average Time Spent on Social Media Daily				
≥4 hours	34	314	0.615 (0.3582-1.0557)	0.0794
<4 hours	17	90		
Income per month (in Php)				
Below monthly minimum wage	5	27	0.928 (0.3694-2.3299)	0.8727
Above monthly minimum wage	16	79		

Table 12. Association of confounders and social comparison .

Characteristics	Social Comparison		PRR (95% CI)	p
	High	Low		
BMI (kg/m^2)				
Normal (18.5-24.9)	146	148	1.000	
Underweight (<18.5)	39	23	1.267 (1.0134- 1.5833)	0.0579
Overweight (25-29.9)	41	32	1.131 (0.8959- 1.4278)	0.3197
Obese (≥30)	19	13	1.196 (0.8779-1.6283)	0.2965
Duration of Social Media Use				
>6 years	227	207	0.785 (0.5921- 1.0396)	0.1468
4-6 years	18	9		
Frequency of Social Media Use				
Daily	244	216	0.530 (0.4867-0.5781)	>0.9999
Weekly	1	0		
Average Time Spent on Social Media Daily				
≥4 hours	202	151	1.437 (1.1207-1.8433)	0.0015
<4 hours	43	65		
Income per month (in Php)				
Below monthly minimum wage	17	17	1.033 (0.6956-1.5329)	0.8744
Above monthly minimum wage	46	49		

Discussion

Demographics

The participants in this study consisted of Filipino adult women aged 18-25 years, representing the largest age group of active social media users (33%) in the Philippines.[1] They were residents of Metro Manila and were excluded from the study if they were pregnant or affected by any medical conditions. Specifically, targeting females was essential as they constitute the primary users and consumers of social media platforms in the country. The majority of participants reported spending at least 4 hours per day on social media for a period of more than 6 years. The most frequently accessed social networking site was Messenger, followed by Facebook and YouTube. The main purposes for using social media were entertainment, staying connected with family and friends, and gathering information. These findings were consistent with a similar study conducted in 2014, which inadvertently contributed to media dependency among Filipino youth.[5]

Regarding their demographic profile, most participants were single and college graduates. Among the participants who were employed, only 22.1% were college graduates, and the majority of them earned above the monthly minimum wage. This profile provides an overview of the education and employment status of the participants and offers valuable context to understand the impact of social media use on this particular demographic group.

By focusing on Filipino adult women, this study sheds light on the social media habits and preferences of a significant segment of the population in Metro Manila. The insights gained from this research can contribute to a better understanding of the role of social media in shaping body image perceptions and social comparison behaviors among young adult females in the Philippines. Additionally, these findings can inform targeted interventions and strategies aimed at promoting positive body image and healthy social media habits among this specific demographic group.

Social Media Addiction

Social media addiction, which falls under the umbrella of internet addiction, is characterized by excessive reliance on technology due to the continuous advancements in digital platforms. This addiction is marked by certain behaviors, such as spending excessive amounts of time on social media and constantly seeking immediate notifications of updates. These behaviors can lead to virtual tolerance, wherein individuals require increasing amounts of time on social media to achieve the same level of satisfaction, virtual communication, where online interactions become more prevalent than face-to-face communication, and virtual problems, where the negative consequences of social media addiction begin to impact daily life.[6]

In the field of research, the Social Media Addiction Scale (SMAS) is commonly utilized to assess social media addiction since there is currently insufficient scientific evidence to diagnose individuals with social media addiction using the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) classification for addiction. The DSM-5 is a widely recognized classification system used by mental health professionals to diagnose various mental health conditions, but it does not yet include specific criteria for diagnosing social media addiction.

The findings of this study revealed that a significant majority of respondents (91.11%) exhibited symptoms of social media addiction. The high prevalence of social media addiction can be attributed to the widespread availability of smartphones and internet access among youth, especially during the pandemic. With limited social activities and increased reliance on electronic devices for communication and entertainment, individuals may have turned to social media as a means of connection and distraction.[7]

The study also identified Messenger as the most frequently used social media platform (98.9%), followed closely by Facebook (97.8%). These platforms served as the primary channels for social media interactions among the participants. Moreover, social media platforms were predominantly utilized for entertainment purposes (98.9%), to maintain connections with family and friends (97.6%), and to gather information (82%). This highlights the multifaceted role of social media in the lives of young adults, serving not only as a source of entertainment but also as a means of staying connected and informed. Additionally, Facebook and Twitter were commonly employed for finding information, entertainment, and interpersonal communication. These platforms offer

a wide range of features that cater to different social and informational needs of users, contributing to their popularity and frequent usage.[8]

The results of this study provide valuable insights into the patterns of social media use and addiction among young adults. The high prevalence of social media addiction underscores the need for awareness and interventions to promote responsible and balanced technology use. Additionally, understanding the specific purposes for which social media platforms are utilized can aid in developing targeted strategies to maximize the benefits of these platforms while mitigating potential negative consequences associated with excessive use and addiction. As social media continues to play a central role in modern communication and social interaction, further research and proactive measures are essential to fostering healthy technology habits and promoting overall well-being among young adults.

Body Image

Body image is a multifaceted concept that encompasses an individual's perceptions, feelings, and thoughts regarding their own body. It involves how one perceives their body size, shape, weight, and height, as well as the emotions and thoughts associated with these physical attributes.[9] Body image is influenced by various factors, including both biological and psychological aspects.[10]

The majority of respondents (87.64%) in this study reported having a neutral body image, while only a small number (6) were identified as having a negative body image. This positive shift could be attributed to the emergence of more "body-neutral" content on social media platforms.[11] Body neutrality aims to move away from the societal emphasis on beauty by encouraging individuals to place less importance on physical appearance and instead focus on what their bodies can do for them, such as giving birth, engaging in physical activities, or carrying groceries.[12]

Additionally, body image is a multidimensional concept influenced by various factors, including peers, family, social environment, social acceptance, social pressure, self-esteem, and body mass index (BMI).[13] In line with this study's findings, out of the 294 participants with a normal BMI, 252 reported a neutral body image. This suggests that having a normal BMI may contribute to a more positive body image among individuals.

Social Comparison

Social comparison refers to the tendency to use others as a benchmark for determining one's behavior, thoughts, and emotions. This can involve upward comparison, where individuals compare themselves to those they perceive as superior, or downward comparison, where individuals compare themselves to those they perceive as inferior.[14]

In this study, more than half of the participants (53.15%) exhibited a high degree of social comparison. People have a fundamental need for social connection, and they often compare themselves to others to fulfill various needs such as uplifting their self-esteem, evaluating the self, making decisions, being inspired, and regulating emotions and well-being.[14] While social comparison can be beneficial by bringing inspiration or promoting self-improvement, it can also lead to negative perceptions and feelings about oneself.[15]

Social Media Addiction and Body Image

The majority of respondents (91.11%) in this study were found to have social media addiction. Among them, most had a neutral body image perception (87.64%), while only a small percentage had a positive body image (10.14%), and an even smaller percentage had a negative body image (1.59%). No statistically significant association was found between social media addiction and negative body image. A similar study conducted among female students at a Saudi Arabian public university also found no significant association between these two variables ($p = 0.22$). The researchers attributed this finding to the respondents' use of social media primarily for information-seeking purposes rather than entertainment.[16] Additionally, the content consumed by participants in this study was not predominantly focused on promoting unrealistic beauty standards, as the majority also used social media to stay connected with family and friends and gather information.[16]

Another study suggested that social media addiction has a minimal effect on negative body image due to users perceiving social media content as more idealized compared to traditional media.[17] The level of social media literacy also plays a significant role, as individuals with low commercial social media literacy may experience more dissatisfaction with their body image upon exposure to social media content.[18]

Overall, while social media addiction may not directly correlate with negative body image, exposure to certain types of content and individual factors can still influence body image perception.[19,20]

Social Media Addiction and Social Comparison

Among women with social media addiction, 56.19% exhibited high levels of social comparison. Social networking sites often influence young women to engage in social comparison regarding their body image and satisfaction, which can lead to both negative and positive associations.[21] Young women tend to idealize images of themselves and compare themselves to idealized images of friends, relatives, celebrities, and models, which can contribute to feelings of inadequacy and negative body image.[22] However, positive communication and self-enhancement strategies, such as posting self-enhancing information about oneself, can help overcome these negative effects.[23]

The results of this study indicated that women with social media addiction were 2.56 times more likely to engage in high levels of social comparison compared to those without social media addiction. This finding is supported by a similar study conducted among female university students, which found that the use of social media was positively correlated with appearance comparisons to peers, which, in turn, mediated the relationship between social media use and body dissatisfaction.[24] Another study exploring the impact of attractive celebrity and peer images on body image showed that appearance comparisons were significantly higher when participants viewed such images compared to travel images, and higher appearance comparisons were correlated with post-exposure body dissatisfaction.[25] The desire for continuous updates and high exposure to peers' and celebrities' content among women with social media addiction may contribute to their increased tendency to engage in social comparison, which can ultimately influence negative body image perception.

Body Mass Index (BMI) and Body Image

The results of this study showed a significant positive association between obesity and negative body image perception (PRR=13.138, p=0.0002). A cross-sectional study conducted among students aged 18-25 years at the University of Sharjah in the UAE also reported a significant correlation between actual BMI and body image dissatisfaction (r=0.57, p<0.001).[26] A meta-analysis similarly demonstrated higher body dissatisfaction among individuals with obesity compared to those with normal weight.[27] A study conducted in the Philippines also found a significant association between body image satisfaction and obesity indices, such as BMI, Waist Circumference, and Waist to Hip Ratio.[7] Specifically, waist to hip ratio appeared to be the most significant factor contributing to the variation in body image satisfaction.[28] Dissatisfaction with one's body image can be attributed to an increase in body fat and weight, as it distorts one's body shape and leads to higher dissatisfaction. However, it is important to note that dissatisfaction with body image is not limited to obese individuals but can also occur among those who are underweight or too thin due to body shape distortion.[28] Additionally, poor body image in obese individuals may be influenced by the internalization of thin beauty ideals, leading to frustration among those with bodies larger than the societal ideal.[19]

Conversely, being overweight was found to have a significant negative association with positive body image perception (PRR=0.304, p=0.0242). This finding aligns with a study conducted in Saudi Arabia, which showed an association between body image satisfaction and BMI.[16]

Social Comparison and Time Spent on Social Media

Women who spend at least 4 hours per day on social media are more likely to engage in social comparison. A study conducted in the US found an association between time spent on Facebook and increased body and weight comparison among young women (p=0.024). This can be explained by Social Comparison Theory, which suggests that people tend to compare themselves to similar others, such as friends and colleagues, and Facebook provides an ideal platform for such comparisons due to its ability to connect individuals with many "similar others".[29] The more time spent on social media platforms, the greater the opportunity for women to engage in repeated comparisons with others.

Income and Body Image

Although the findings regarding income and body image were not statistically significant (PRR=13.333, p=0.0703), there is a strong positive association

between having an income below the minimum wage and negative body image. Various studies have reported different results regarding the relationship between socioeconomic status and body image. One study suggests that obesity is inversely proportional to socioeconomic status, indicating that individuals in higher income groups may have better body image and lower BMI due to their ability to afford a healthier diet and lifestyle.[30] However, a study conducted in Oman showed a significant relationship between positive body image and monthly household income, suggesting that individuals from families with higher household incomes are less likely to appreciate their body image due to increased access to goods and restaurants, including fast food, which can increase the risk of obesity.[31] On the other hand, some studies have found no association between body image and socioeconomic status.[32] Another study on body image satisfaction of economically depressed urban Filipino women showed no difference in the mean income when they grouped their respondents according to body image perception.[28] It is important to recognize that income is not the sole factor influencing body image perception, and other variables may contribute to the complex relationship between income and body image.

Conclusion

In conclusion, this study sheds light on the complex relationship between social media addiction, social comparison, body mass index (BMI), income, and body image perception among women. The findings suggest that while social media addiction itself may not directly impact negative body image, it increases the likelihood of engaging in social comparison, which in turn can influence body image perceptions. Obesity was consistently associated with negative body image, indicating the importance of addressing body shape distortion and societal beauty ideals. The study did not find a significant relationship between income and body image, suggesting that additional factors may contribute to this relationship. These findings contribute to one's understanding of the factors influencing body image perceptions and can inform interventions aimed at promoting positive body image and well-being among women.

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An analytical cross-sectional study on the correlation between patient-doctor relationship and medication adherence of hypertensive Filipinos aged 40-65 in greater Manila Area during the COVID-19 pandemic

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Abstract

Introduction Hypertension is a key modifiable risk factor for myocardial infarction and stroke, yet medication adherence remains low. The ongoing COVID-19 pandemic has further complicated the management of chronic diseases like hypertension. This study aimed to explore the correlation between the patient-doctor relationship and medication adherence among hypertensive Filipinos aged 40-65 years in the Greater Manila Area during the pandemic.

Methods A cross-sectional study was conducted involving 131 hypertensive Filipino participants. Data were collected through an online survey, assessing participant demographic and medical profiles, medication adherence using the Hill-Bone Compliance Scale (HBCS), and the patient-doctor relationship using the Physician-Doctor Relationship Questionnaire-9 (PDRQ-9).

Results Approximately half of the participants demonstrated good adherence to hypertension medication. A weak but significant positive correlation was found between overall medication adherence and the patient-doctor relationship. The duration of anti-hypertensive drug intake also showed a weak positive correlation with medication adherence. Factors such as comorbidities and type of consultation did not significantly impact medication adherence.

Conclusion This study emphasizes the significance of the patient-doctor relationship in medication adherence among hypertensive Filipinos during the COVID-19 pandemic. Enhancing communication and trust between patients and physicians can potentially improve medication adherence and overall disease management.

Key words: COVID-19, hypertension, medication adherence, perception, anti-hypertensive agents, cross-sectional

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Hypertension is widely recognized as the most important modifiable risk factor for myocardial infarction and stroke.[1] Medications serve as the foundation of effective hypertension treatment, yet clinical adherence remains low, despite the availability

of adequate data on the efficacy of antihypertensive drugs).[2,3] Non-adherence to medications is a complex, multidimensional parameter that cannot be solely attributed to the patient.[4] Factors such as poor physician-patient communication, limited access to care, and high costs negatively impact medication adherence.[4] Moreover, these challenges have been exacerbated by the ongoing COVID-19 pandemic, leading to potential oversight of patients with chronic diseases whose management is significantly affected.[5,6] Patients with chronic diseases, including hypertension, face the additional challenge of requiring follow-ups, check-ups, and prescription refills while being subjected to strict lockdown protocols that restrict movement.[6]

While previous studies have focused on the associations between socio-demographic factors and medication non adherence in hypertensive individuals, limited research has explored the relationship between patients and their primary healthcare providers, as well as patients' adherence to antihypertensive medication during the COVID-19 pandemic. Therefore, this study aimed to determine the correlation between patient-doctor relationship and medication adherence among hypertensive Filipinos aged 40-65 in the Greater Manila Area during the COVID-19 pandemic.

Methods

This analytical cross-sectional study was conducted to investigate the correlation between patient-doctor relationship and medication adherence among hypertensive Filipinos aged 40-65 in the Greater Manila Area during the COVID-19 pandemic. The study obtained ethical approval from the UERM Ethics Review Committee with the RIHS ERC Code: 1245/C/2022/055 prior to data collection.

The study's inclusion criteria were as follows: participants had to be Filipino citizens aged between 40 to 65 years old, residing within the Greater Manila Area. Additionally, they had to have a diagnosis of hypertension and be prescribed antihypertensive medications. Individuals without internet access were excluded from participating in the study.

The required sample size was 131, based on a study.[7] The confidence level (α) was set at 0.05, $\beta = 0.21$, and an expected correlation coefficient of $r = 0.24$, from a study done in Poland.[8]

For this study, respondents were obtained using convenience sampling and snowball sampling methods. An announcement detailing the research and its objectives was created and widely circulated through social media platforms such as Facebook, Twitter, and Instagram. The announcement included a link and QR code, enabling potential participants to access the survey easily. Additionally, participants were encouraged to share the survey with others who met the inclusion criteria, using the snowball sampling approach to expand the participant pool.

The survey consisted of four parts: 1) participant sociodemographic details, 2) medical profile on hypertension, 3) medication adherence, and 4) assessment of the strength of the patient-doctor relationship. The medical profile section collected information on the duration of hypertension, duration and number of antihypertensive drugs taken, presence of co-morbidities, and type of consultation with their primary care physician (PCP).

Medication adherence was measured using the Hill-Bone Compliance Scale (HBCS, Cronbach's alpha = 0.84).[9] The degree of patient-doctor relationship was ascertained using the Physician-Doctor Relationship Questionnaire-9 (PDRQ-9, Cronbach's alpha = 0.96).[10]

The HBCS consisted of 14 questions, subdivided into "Medication taking," "Salt intake," and "Appointment adherence." Participants rated the degree to which each prompt applied to them using a Likert scale, with 1 representing "Never" and 4 representing "All of the time." Lower raw scores were interpreted as better adherence and were later inversed during statistical analysis. The PDRQ-9 is a nine-question survey used to quantify the patient's positive perception of their PCP. Participants responded using a Likert scale, with 1 representing "Not at all appropriate" and 5 representing "Totally appropriate." Scores ranged from 9 to 45, with higher scores indicating better perceived patient-doctor relationship.

Favorable results in this study were defined as higher PDRQ scores and lower inversed HBCS scores, which may be interpreted as a higher perceived patient-doctor relationship and higher medication compliance, respectively. Consequently, higher inversed HBCS scores were analogous to higher medication adherence. The patient-doctor relationship and medication compliance were defined based on the sum of the PDRQ-9 and HBCS scores, respectively. The maximum possible inversed HBCS score of 56 was defined as perfect medication adherence, while a score of 14 was the lowest possible value. Good

adherence was defined as raw sums of 80% or more of the total possible score, while scores less than 80% were considered indicative of poor adherence.[11] "Medication taking," "salt intake," and "appointment adherence" were subsets of the HBCS, with maximum inversed scores of 36, 8, and 12, respectively. After inversions, higher scores in the medication adherence subsets indicated better adherence to the prescription drug instructions. Higher scores for salt intake implied patient avoidance of salt, and higher appointment adherence scores indicated a greater ability to maintain scheduled appointments with the PCP.

Statistical analysis was performed using JMP Pro 16 (Licensed). Descriptive statistics, correlations, and all statistical analyses were conducted to determine the correlation between medication adherence and the degree of perceived patient-doctor relationship. Pearson's correlation coefficient (r) was calculated for this purpose. Additionally, correlation analyses were performed between the hypertension profile of the patients and inversed HBCS scores to identify potential factors that may have influenced medication adherence. An independent t-test was used to assess differences in medication adherence based on the presence of other comorbidities (labeled "present" or "not present") and the type of the most recent consultation (labeled "telemedicine" or "face to face"). Finally, odds ratios were calculated to determine the strength of association between good and poor medication adherence and the responses from the medical profile.

Results

The majority of participants in this study were between 56 and 65 years old, with a higher proportion of females. Most participants were married and had a college degree or higher education. The income distribution showed that the largest group had an income of less than 25,000 Php, while the smallest group had an income of 50,000-75,000 Php. The participants were primarily from the second district of the National Capital Region (NCR), particularly Mandaluyong City, Marikina City, Pasig City, Quezon City, and San Juan City. Participants from the Greater Manila Area were primarily from Cavite. The duration of hypertension varied, with most participants having a duration of less than 5 years or 6 to 10 years. The majority of participants had other comorbidities in addition to hypertension, and face-to-face consultations were the most common type of interaction with their primary care physician. Approximately half of the participants demonstrated good adherence to their hypertension medication (Table 1).

PDRQ – 9 resulted to a mean of 39.8±7.05 from the possible score range of 9 to 45. This score is indicative of a favorable patient perception of the patient doctor relationship. The inversed HBCS score has a mean of 46.9±4.24 which correlates with higher adherence (Table 2).

The correlation analysis showed a weak but significant positive correlation between overall medication adherence and the patient-doctor relationship (Pearson's r =0.1698, p=0.0465) (Table 3). The scatterplot depicts a positive weak correlation between the inversed HBCS score and PDRQ-9 (Figure 1). The duration of anti-hypertensive drug intake showed a weak positive correlation with medication adherence (Pearson's r = 0.2217, p = 0.009) (Table 4).Participants with other comorbidities and those who had face-to-face consultations did not show significant differences in their HBCS scores compared to other participants (Table 5).

Furthermore, the study found a negative association between comorbidities and good adherence; however, the results were not statistically significant (OR = 0.84, p = 0.37) (Table 6).

Similarly, there was a negative association between face-to-face consultation and good adherence, but the result was not statistically significant (Table 7). Regarding the subsets of the HBCS, only medication taking demonstrated a significant weak positive correlation with patient-doctor relationship scores. However, salt intake and appointment adherence did not show significant correlations with HBCS scores (Table 8).

Discussion

During the pandemic surge, doctors have advised older adults with chronic diseases to stay at home to reduce the risk of exposure to the virus and protect their health.[12] However, this measure has led to challenges for many patients who rely on support from others for their therapies and prescriptions. The COVID-19 pandemic has been found to have a negative impact on the patient-doctor relationship (PDR) as patients may feel emotionally and physically distant from their primary care physicians (PCPs).[2,12,13]

Table 1. Socio-demographic characteristics and clinical characteristics of participants (N=138).

Characteristics		Frequency (N)	Percentage (%)
Age	40 - 44	9	6.52
	45 - 55	49	35.51
	56 - 65	80	57.97
Sex	Male	56	40.58
	Female	82	59.42
Education	Elementary school or less	2	1.45
	High School	16	11.59
	College level or more	120	86.96
Marital Status	Single	15	10.87
	Married	107	77.54
	Separated/Divorced	15	10.87
	Widowed	1	0.72
Employment status	Unemployed	20	14.49
	Employed	82	59.42
	Retire	36	26.09
Socioeconomic status (Php)	< 25,000	40	28.99
	25,000 - 50,000	24	17.39
	50,000 - 75,000	14	10.14
	75,000 - 100,000	25	18.12
	≥ 100,000	35	25.36
NCR District of Residence	First District	8	5.80
	Second District	49	35.51
	Third District	5	3.62
	Fourth District	21	15.22
	Cavite	41	29.71
	Rizal	12	8.70
	Bulacan	1	0.72
	Laguna	1	0.72
Duration of hypertension (years)	≤ 5	52	37.68
	6 - 10	44	31.88
	11 - 15	19	13.77
	16 - 20	6	4.35
	> 20	17	12.32
Number of anti-hypertensive drugs currently taking	1 - 2	118	85.51
	3 - 4	16	11.59
	≥ 5	4	2.90
Duration of anti-hypertensive drugs intake (years)	≤ 5	54	39.13
	6 - 10	42	30.43
	11 - 15	19	13.77
	16 - 20	6	4.35
	> 20	17	12.32
Presence of other comorbidities	Present	76	55.07
	Absent	62	44.93
Type of consultation adherence	Clinic	112	81.16
	Teleconsult	26	18.84
	Good adherence	70	50.72
	Poor adherence	68	49.28

Table 2. Descriptive statistics of the total responses in the PDRQ-9 and HBCS.

Survey	Mean	Min	Max	SD
PDRQ-9[a]	39.8	9	45	7.05
HBCS[b]	46.9	29	54	4.24

[a]Patient Doctor Relationship Questionnaire 9
[b]Inversed Hill-Bone Compliance Scale

Table 3. Correlation analysis for HBCS and PDRQ-9.

Correlation coefficient[a]	p-value	CI 95%	Direction	Strength
0.1698	0.0465	0.003-0.328	positive	weak

[a]Pearson's r

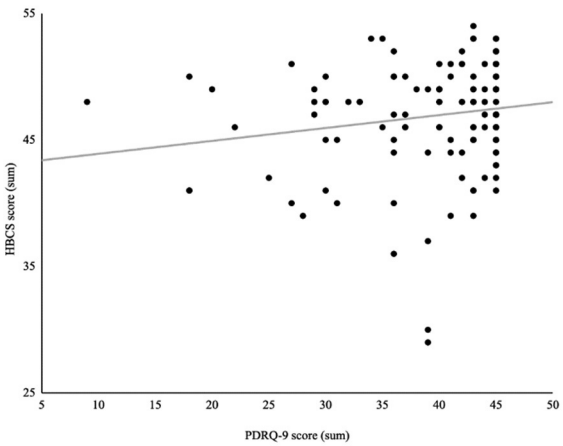

Figure 1. Scatterplot of HBCS score sums and PDRQ-9 score sums.

Table 4. Correlation analysis for HBCS with hypertensive profile.

Variable	Correlation coefficient	p value	Direction
Duration of hypertension (years)[a]	0.1492	0.0807	N/A
Number of anti-hypertensive drugs currently taking[a]	-0.0246	0.7745	N/A
Duration of anti-hypertensive drug intake (years)[a]	0.2217	0.009*	positive

[a]Pearson's r, *p<0.05

Table 5. T - test results comparing the medicine adherence among presence of comorbidities and type of most recent consult.

Variable		N	Mean	SD	p value
Presence of other comorbidities	Present	76	46.90	3.90	0.93
	Not present	62	46.96	4.51	
Type of most recent consultation	In person	112	46.70	4.40	0.12
	Telemedicine	26	47.92	3.35	

Table 6. Odds ratio of presence of comorbidities to good and poor adherence.

	Good Adherence	Poor Adherence	Odds Ratio	p-value
With comorbidities	30	32	0.84	0.37
Without comorbidities	40	36		

Table 7. Odds ratio of type of recent consultation to good and poor adherence.

	Good Adherence	Poor Adherence	Odds Ratio	p-value
Face to face	55	57	0.71	0.28
Teleconsultation	15	11		

Table 7. Odds ratio of type of recent consultation to good and poor adherence.

	Good Adherence	Poor Adherence	Odds Ratio	p-value
Face to face	55	57	0.71	0.28
Teleconsultation	15	11		

Table 8. Correlation analysis for PDRQ-9 and the subsets of HBCS.

Variable	Correlation Coefficienta	p-value	Direction
Medication taking*	0.3229	.0048	positive
Salt intake	0.0089	.9178	N/A
Appointment adherence	-0.0603	.4824	N/A

[a]Pearson's r, *p<0.05

For elderly patients, medication adherence becomes even more crucial during these challenging times. Many older adults may face difficulties in adhering to their prescribed medications due to issues such as forgetfulness or misunderstanding prescription labels.[12,13]

In this study, a significant number of respondents aged between 56 and 60 demonstrated commendable adherence to their medication regimen. The majority of participants reported never forgetting to take their medications, consistently filling their prescriptions, and ensuring an adequate supply of hypertension medication. Additionally, they expressed never skipping their medication before visiting the doctor, showcasing a strong commitment to their treatment plan, even when feeling better.

Medication adherence can be influenced by various factors, including the patient-doctor relationship. Overall medication adherence showed a weak but significant positive correlation with the patient-doctor relationship (Pearson's $r = 0.1698$, $p = 0.0465$).[14] Trust emerged as a critical aspect of the patient-doctor relationship, with patients relying on the competency of their PCP.[14] In this study, the quality of the relationship between patients and their PCP impacted medication adherence. Patients tended to adhere to medications if their PCP had sufficient time for them, understood their concerns, and if there was agreement between the PCP and patient regarding the nature of the patient's medical symptoms. Shared agreement, an engaged relationship, and high levels of communication between patients and

their physician positively influenced medication adherence.[15,16] Conversely, inadequate attention to the antihypertensive medication regimen by physicians had a negative impact on adherence.[14]

Regarding the hypertensive profile, only the duration of anti-hypertensive drug intake revealed a significant weak positive correlation with medication adherence (Pearson's $r = 0.2217$, $p = 0.009$).[17] This indicates that the duration of anti-hypertensive drug intake positively impacts medication adherence. Although the World Health Organization (WHO) suggests that longer duration of antihypertensive treatment negatively affects adherence, other studies report contrary findings.[17,18] Most newly treated hypertensive patients tend to discontinue medications within a year, and there is a higher risk of discontinuation among newly treated hypertensive patients aged below 40 years.[17] However, patients who have taken antihypertensive medication for more than 5 years exhibit better medication adherence ($p < 0.05$).[18] In the present study, the number of antihypertensive drugs currently taken by the patients did not significantly affect medication adherence. However, multiple medications have been recognized as a barrier to medication adherence, and better adherence is observed in patients using single-pill combinations as a treatment strategy.[17]

The Hill Bone Compliance Scale (HBCS) assesses three important behavioral domains of high blood pressure treatment: 1) reduced sodium intake; 2) appointment keeping; and 3) medication taking. Although not the main focus of this study, the analysis of these domains showed that only the behavior domain of medication taking had a weak significant correlation with PDR (Pearson's $r = 0.3229$, $p = 0.0048$). This suggests that the patient-doctor relationship primarily influences medication taking behavior, while appointment keeping and reduced sodium intake, both crucial aspects of managing hypertension, are not strongly influenced by the patient-doctor relationship.

Limitations

This study had some limitations primarily related to the timing of data collection during the pandemic. The researchers encountered challenges in gathering data from a large sample of older hypertensive individuals due to the constraints of conducting the survey online. The target population, aged 40-65, faced difficulties in navigating the online survey platform as they were less familiar with such digital tools. The limitations in data collection might have affected the overall sample size and the representativeness of the study results. As older adults are a crucial demographic for this study, the online format could have excluded some potential participants, leading to a less diverse sample. Consequently, the findings may not fully capture the experiences and perspectives of all older hypertensive individuals in the target population. Future studies should consider employing multiple data collection methods, including face-to-face or phone interviews, to ensure more comprehensive inclusion and representation of this important demographic.

Conclusion

In conclusion, this study revealed a weak, positive correlation between patients' perceived relationship with their doctor and their adherence to anti-hypertensive medication among hypertensive Filipinos aged 40-65 in the Greater Manila Area.

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Sitmate: an android mobile application for the prevention of musculoskeletal discomfort among a business process outsourcing company workforce management personnel*

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Abstract

Introduction Due to COVID-19 pandemic, many have shifted into working at home which led to physical inactivity. This may cause musculoskeletal discomfort, chronic disease, muscle atrophy and spinal imbalance due to improper and prolonged sitting posture. Since mobile devices are relatively available for most of the office workers, there were still a lack of evidence-based mobile applications that can counteract the inactivity through exercises, which led to the researchers to create an application called SitMate that consists of evidence-based exercises which aimed to prevent musculoskeletal discomfort among a business process outsourcing company Workforce Management Personnel (BPO-WMP).

Methods Eleven participants (18-40 years old) full-time, work-from-home BPO-WMP were randomized into Treatment Group(TG)(n=6) and Control Group (CG)(n=5). The TG received one month intervention with the use of SitMate Application containing relaxation exercises, range of motion exercises and stretching exercises, and notifications for postural correction while the CG continued their usual working schedule.

Results There were no significant differences between two groups on all body parts that were measured using the Cornell Musculoskeletal Discomfort Questionnaire, and no significant differences in the intragroup pre-test and post-test scores on all body parts between TG and CG. For the intra-group post-test of the TG, there were noted improvements on the hip/buttock, right shoulder, upper back (median = 0) and right wrist (median = 1.5). There was also a noted increase in discomfort on the neck (median = 1.5) and lower back (median = 3). For the post-test of the CG, there were noted improvements on the right shoulder, right wrist (median = 0) and lower back (median = 1.5).

Conclusion This study has shown that the SitMate application does not effectively reduce the prolonged sitting-related discomfort among the personnel after 1 month of intervention.

Key words: SitMate, mobile application, musculoskeletal discomfort, Cornell Musculoskeletal Discomfort Questionnaire, concentric workforce management, office workers, prolonged sitting, physical inactivity, low back pain, relaxation exercises, posture

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*Dr. Fernando S. Sanchez Research and Publication Awardee, 24th Annual Research Forum, UERMMMCI Research Institute for Health Sciences, November 23, 2022

The COVID-19 pandemic has caused many individuals from different fields into work-from-home arrangements leading to sedentary behaviors such as prolonged sitting and physical inactivity. This may cause musculoskeletal discomfort, chronic disease, muscle atrophy and spinal imbalance due to improper and prolonged sitting posture.[1-3] Approximately 60% of older adults report sitting for more than 4 hours per day, with over 54% watching television more than 3 hours and 65% sitting in front of a screen for over 3 hours.[4] On an 8-hour workday, employees sit 70.1 % of

the work time, translated to 5.6 hours of sitting time.[5] Prolonged sitting has detrimental effects on overall health.[6] This may cause musculoskeletal injuries such as neck, shoulder, and low back pain.[7] Physical activity prevents deleterious consequences of musculoskeletal problems, pain and improves function.[8,9] A decrease in non-specific low back pain is seen within a few weeks when treated with therapy such as aerobic, stretching, and stabilizing exercises.

Out of 379 eligible physical activity applications in one study, 45 had an alarm or a reminder feature, only seven for resistance training were evidence-based, four were based on physical activity reports, two were based on personal experience and no application for aerobic activities, stabilization, active range of motion and stretching was evidence-based.[10] This exposed the need for evidence-based mobile apps that can be used to enhance health outcomes.[11] The lack of evidence-based applications prompted the researchers to create SitMate, an application consisting of evidence-based exercises aimed to prevent musculoskeletal discomfort. The objective of this study is to evaluate the effectiveness of SitMate in preventing work-related disability among a business process outsourcing company Workforce Management Personnel (BPO-WMP).

Methods

The study used an experimental design where full time work-from-home management personnel from a business process outsourcing company were randomly assigned to the SitMate or control group for one month (August 9, 2021, to September 3, 2021). SitMate is an application developed by the researchers which included relaxation exercises and exercises designed to reduce musculoskeletal discomfort. No intervention was given to the control group. Musculoskeletal discomfort was measured at baseline and after one month using the Cornell Musculoskeletal Discomfort Questionnaire.[12] The difference in scores before and after the interventions were compared between the SitMate and control groups. The study was approved by the UERMMMCI Research Institute for Health Sciences Ethics Review Committee (ERC Code 0930/C/2021/011; approved April 26, 2021).

Participants included in this study were full-time workforce management personnel of a business process outsourcing company that worked from home of with an age-range of 18-40 years old, either single or married, had access to an Android mobile phone, at least a college graduate, and must be sitting continuously for at least 2.5 hours. The participants excluded from the study are those who had a history or current health conditions such as recent fractures, evidence of acute inflammatory or infectious processes such as Guillain-Barre, polymyositis, and dermatomyositis. Employees with osteoarthritis, sharp pain during joint movement and muscle elongation, joint instability, hematoma, deep venous thrombosis, severe cardiopulmonary diseases, cancer and communicable diseases such as SARS-CoV-2, tuberculosis and pneumonia were likewise excluded.. The computed sample size was 30 participants per group.

The intervention tested was SitMate, an application developed by the researchers which included relaxation exercises and exercises designed to reduce musculoskeletal discomfort based on available studies – active range of motion, flexibility, stabilization and aerobic. The postural exercises consisted of flexion-extension, elevation-depression, protraction-retraction, rotation, tilt, pump, weight-shifting and deep breathing. The daily exercises guide included marching in place, jogging in place, squats, shoulder circumduction, shoulder press, elbow flexion-extension, abdominal curls, shoulder flexion, shoulder abduction, running, lunges, bird dog, and leg raises. Exercises were progressive from Week 1 to Week 4 and were required to be done on work days. SitMate had reminder and alarm features. It also included instructional videos on how to do the exercises. Musculoskeletal discomfort was measured at the start and at the end of four weeks using the Cornell Musculoskeletal Discomfort Questionnaire (CMDQ).[12]

The CMDQ is a 54-item questionnaire containing a body map diagram and questions about the frequency of musculoskeletal discomfort, severity of musculoskeletal discomfort and interference of musculoskeletal discomfort in the participants' work across 20 body parts specifically neck, upper back, shoulders, elbows, wrists, low back, hips/buttocks, thighs, knees and lower legs. Frequency of discomfort was calculated using a 5-point Likert scale: Never (0), 1 or 2 times/week (1.5), 3 or 4 times/week (3.5), every day (5) or several times a day (10). It was multiplied by the severity, scored using a 3-point Likert scale: slightly comfortable = 1, moderate uncomfortable = 2, very uncomfortable = 3 and interference rating with

3-point Likert scale: Not at all = 1, slightly interfered = 2, substantially interfered = 3. A high score indicated increased risk in having musculoskeletal discomfort. A video tutorial on how to answer the CMDQ was provided to both SitMate and control groups.

Qualified respondents who gave their informed consent were randomly allocated to either the SitMate or control groups through the block random sampling methods. The CMDQ, with a tutorial video, was sent to all participants at the start of the study. After completion of the CMDQ, the link to the SitMate application with a tutorial video on how to use the application was sent to the participants in the intervention group. All SitMate participants were monitored weekly for the accomplishment of tasks to make sure that the participants were doing the exercises as well as to check on their experience gained for progression. Any participant who reported increased pain and discomfort was withdrawn from the study. After the fourth week, the CMDQ sent to all participants in both the SitMate and control groups were collected for the post-intervention evaluation of musculoskeletal discomfort.

Data extracted from the CMDQ were encoded and analyzed using SPSS. The Wilcoxon-signed rank test was used to compare the pre- and post-intervention scores in each group. The Mann Whitney U test was used to compare the difference of the pre- and post-intervention scores between the SitMate and control groups. The level of significance was set at $p < 0.05$. Participants who did not finish the study were documented but not included in the analysis.

Results

Initially, there were 21 potential participants, however, only 18 responses chose to participate in the study. With the 18 responses received, 7 participants were excluded due to not having an Android phone, uncontrolled hypertension, joint instability or having equal to or less than 1hr and 30 minutes of sitting time hence only 11 participants were included. The 11 participants were then randomized to the treatment group (TG) and control group (CG). Six participants were allocated to the TG and five participants were allocated to the CG. One participant from the TG was withdrawn as the participant was not able to answer the CMDQ and did not receive the intervention.

There was no significant difference between the TG and the CG for the general characteristics (Table 1). There were no significant differences between two groups on all body parts that were measured using CMDQ, and no significant differences in the intragroup pre-test and post-test scores on all body parts between TG and CG (Table 2). However, it is noted that there was a slight improvement in comparing the changes between TG and CG in the hip/buttocks (median = -1.5). For the intra-group post-test of the TG, there was noted improvements on the hip/buttock, right shoulder, upper back (median = 0) and right wrist (median = 1.5). There was also a noted increase in discomfort on the neck (median = 1.5) and lower back (median = 3) (Tables 3 & 4). In contrast, for the post-test of the CG, there were noted improvements on the right shoulder, right wrist (median = 0) and lower back (median = 1.5).

Table 1. General demographics of the participants.

Characteristics		Participants	
		Treatment (n=5)	Control (n=5)
Sex	Male	4	3
	Female	1	2
Age	Median Age	40 yrs.(33-40)	33 yrs.(31-40)
Cumulative Duration Sitting Per Day	2 Hrs & 30 Min.	2	2
	Greater than 2 Hrs & 30 min.	3	3
Educational Attainment	College Graduate	5	5
	Master's Degree	0	0
	Doctorate Degree	0	0

*Unless specified, data are presented as median (interquartile range (IQR))

Table 2. Comparison of the difference in both treatment group and control group after 1 month.

Body Parts	Changes in TG	Changes in CG	Between-Group p
Neck	0 (0-3)	0 (0-0)	0.310
Right Shoulder	0 (-1.5-0)	0 (-1.5-0)	0.690
Left Shoulder	0 (-1.5-0)	0 (-1.5-1.5)	1.000
Upper Back	0 (-1.5-1.5)	0 (0-1.5)	0.421
Right Upper Arm	0 (0-3)	0 (-2-1.5)	0.421
Left Upper Arm	0 (-1.5-1.5)	0 (-1.5 - 1.5)	1.000
Lower Back	0 (-3-3.5)	0 (-18.5-1.5)	0.421
Right Forearm	0 (-3-0)	0 (0-4.5)	0.222
Left Forearm	0 (0-6)	0 (0-1.5)	0.421
Right Wrist	0 (-7-10.5)	0 (-1.5 - 12.5)	0.841
Left Wrist	0 (0-6)	0 (0-0)	0.310
Hips/ Buttocks	-1.5 (-3.5-0)	0 (-12.5-0)	0.548
Right Thigh	0 (0-6)	0 (0-1.5)	0.548
Left Thigh	0 (0-6)	0 (0-1.5)	1.000
Right Knee	0 (0-3)	0 (-1.5-0)	0.222
Left Knee	0 (0-3)	0 (0-0)	0.690
Right Lower Leg	0 (0-6)	0 (0-1.5)	1.000
Left Lower Leg	0 (0-6)	0 (0-0)	0.690

Data are presented as median (interquartile range (IQR)). Mann- Whitney U Test was performed for intergroup comparisons, p for significant change difference between groups (<0.05).

Table 3. Comparison of the pre-test and post-test score of the treatment group after 1 month.

Body Parts	Pre-test Score of the Treatment Group	Post-test Score of the Treatment Group	Intra-group p-value
Neck	0 (0-1.5)	1.5 (0-3)	0.180
Right Shoulder	1.5 (0-1.5)	0 (0-1.5)	0.157
Left Shoulder	0 (0-3)	0 (0-3)	0.655
Upper Back	1.5 (0-3)	0 (0-3)	0.564
Right Upper Arm	0 (0-0)	0 (0-3)	0.180
Left Upper Arm	0 (0-0)	0 (0-6)	0.317
Lower Back	1.5 (0-3.5)	3 (0-5)	0.715
Right Forearm	0 (0-0)	0 (0-3)	0.180
Left Forearm	0 (0-0)	0 (0-6)	0.317
Right Wrist	3 (0-7)	1.5 (0-14)	1.000
Left Wrist	0 (0-0)	0 (0-6)	0.180
Hip/Buttock	1.5 (0-3.5)	0 (0-0)	0.102
Right Thigh	0 (0-0)	0 (0-6)	0.180
Left Thigh	0 (0-0)	0 (0-6)	0.317
Right Knee	0 (0-0)	0 (0-3)	0.180
Left Knee	0 (0-0)	0 (0-3)	0.317
Right Lower Leg	0 (0-0)	0 (0-6)	0.317
Left Lower Leg	0 (0-0)	0 (0-6)	0.317

Data presented as median (interquartile range (IQR)). Wilcoxon-signed rank test was performed for intragroup comparisons.

Table 4. Comparison of the pre-test and post test score of the control group after 1 month.

Body Parts	Pre-test Score of the Control Group	Post-test Score of the Control Group	Intra-group p value
Neck	0 (0-1.5)	0 (0-1.5)	0.564
Right Shoulder	1.5 (0-3.5)	0 (0-3.5)	0.317
Left Shoulder	0 (0-3)	0 (0-1.5)	1.000
Upper Back	0 (0-1.5)	0 (0-1.5)	0.317
Right Upper Arm	0 (0-3.5)	1.5 (0-1.5)	0.655
Left Upper Arm	0 (0-1.5)	0 (0-1.5)	0.564
Lower Back	3.5 (0-20)	1.5 (0-5)	0.285
Right Forearm	0 (0-1.5)	0 (0-6)	0.317
Left Forearm	0 (0-1.5)	0 (0-1.5)	0.317
Right Wrist	1.5 (0-1.5)	0 (0-14)	1.000
Left Wrist	0 (0-1.5)	0 (0-1.5)	0.317
Hip/Buttocks	1.5 (0-14)	1.5 (0-3.5)	0.317
Right Thigh	0 (0-3.5)	0 (0-3.5)	0.317
Left Thigh	0 (0-1.5)	0 (0-1.5)	0.317
Right Knee	0 (0-1.5)	0 (0-1.5)	0.317
Right Lower Leg	0 (0-0)	0 (0-1.5)	1.000

Data are presented as median (interquartile range (IQR)). Wilcoxon -signed rank test was performed for intragroup comparisons

The likelihood of delayed-onset muscle soreness to occur when using the SitMate Application every 5 days is 0.588 case in weeks 1 and 2, 0 case in week 3, and 0.526 case in week 4.

Discussion

To the best of the authors' knowledge, SitMate is the first mobile application to incorporate postural awareness and weekly relaxation exercise with its corresponding progression. In addition, this study is the first to use CMDQ to evaluate the effectiveness of SitMate among a business process outsourcing company workforce management personnel (BPO-WMP).

In contrast to the previous study on reducing musculoskeletal discomfort conducted among office workers which was implemented for a month by encouraging the participants to "stand-up and sit-less" every 30 minutes, resulted to a significant decrease in sitting time possibly leading to decreased discomfort in the neck, upper arm, upper back, low back and hip/thigh.[5,13,14,15,16,17] In the SitMate application, it has the same feature where the participants are encouraged to stand up every 30 minutes[5,18,19] with incorporation of relaxation exercises which was supported by providing exercises such as cervical spine motions[20], scapular motions[21] and stretching of major muscle groups to reduce muscle aches, pain, and stiffness during prolonged sitting.[5,9,18-21] Based on the evidence provided in these supporting articles, the researchers expected that the discomfort score would decrease among participants who received the SitMate intervention. Nonetheless, there was no statistically significant improvement based on the Cornell Musculoskeletal Discomfort Questionnaire in comparison to the pre-test and post-test scores of the Treatment Group. However, it's important to note that the scheduling of progression for the SitMate intervention was based on the completion of adverse effect forms at the end of each week. These forms were only accessible to participants once they finished the prior week. Surprisingly, 60% of the participants took longer than the designated timeframe to complete the first and second weeks, 80% exceeded the third-week timeframe, and 100% exceeded the fourth-week timeframe. As a result, there is a possibility that some participants did not receive the intended relaxation intervention as intended due to the delay in progressing through the specified timeframe. Moreover, studies conducted had shown that sustaining prolonged posture heavily contributes to having musculoskeletal discomfort causing improper joint loading on cervico-thoracic and lumbosacral joint, and spinal imbalance.[18,22,23] Another study where either healthy workers or workers with chronic low back pain experienced low back pain due to the assumption of slumped posture after 20 minutes during an hour of sitting.[5] Therefore, the importance

of correcting posture every 20 minutes per hour can help in reducing musculoskeletal discomfort.[18] Based on the study results and the observed delayed progression of participants, it is plausible to infer that some participants may not have fully complied with the suggested postural correction, which was delivered through their cell phones every 20 minutes per hour during work hours. This lack of compliance could have contributed to the prolonged discomfort and exceeded timeframes for the SitMate intervention, potentially affecting the overall effectiveness of the intervention in reducing discomfort scores. Further analysis and investigation would be required to understand the reasons behind the non-compliance and its impact on the study outcomes.

Numerous studies have demonstrated that mobile applications are effective tools for improving health outcomes. For instance, the NeckProtector mobile app has been shown to effectively reduce neck pain by incorporating stretching exercises and encouraging reduced sitting time.[11,23,24,25] Considering these positive results, it is recommended that mobile health applications should include pre-programmed training plans aimed at reducing prolonged sitting.[26] On the other hand, for practical application of SitMate, it may not significantly reduce musculoskeletal discomfort among office workers, however it can reduce their sitting time and improve their health outcomes by providing additional knowledge on how the body functions during a specific relaxation exercise and by promoting muscle activity.[11] By incorporating SitMate as a guide, office workers have the opportunity to proactively address several health concerns associated with their sedentary work environment. Regular use of SitMate can help reduce physical inactivity, which, in turn, lowers the risk of cardiovascular diseases and diabetes. The app's guidance on Range of Motion (ROM), aerobic exercises, stretching, and stabilization exercises can be beneficial in improving venous return in the lower limbs and reducing the risk of muscle atrophy.

Through its well-designed exercise programs, SitMate empowers users to safely perform the specified exercises, ensuring proper form and technique. By engaging in these exercises, office workers can counteract the negative effects of prolonged sitting, promoting better overall health, and enhancing their physical well-being. Embracing SitMate as a part of their daily routine can lead to a more active and healthier lifestyle, mitigating the adverse effects of sedentary behavior in the office environment.[13,27,28] Moreover, the inclusion of timed postural reminders in the SitMate application prompts users to adopt and maintain proper posture throughout their workday. These reminders play a crucial role in reducing the risk of muscle imbalances on the spine. By promoting regular adjustments to ergonomic positions, SitMate helps users prevent strain on specific muscle groups and encourages a balanced distribution of stress on the spine. Consistent use of the app's postural reminders can lead to improved musculoskeletal health and a reduced likelihood of developing discomfort or injuries related to poor sitting posture.[18,22]

Overall, SitMate holds great significance when used properly during working hours, especially for work-from-home office workers. By providing guided exercises, postural reminders, and promoting regular movement, SitMate can effectively decrease the risk of musculoskeletal discomfort and systemic complications such as cardiac and metabolic conditions. With many office workers facing physical inactivity due to their current work-from-home setups, the app's features address the specific challenges of sedentary behavior in this context.

By incorporating SitMate into their daily routine, office workers can proactively combat the negative effects of prolonged sitting and reduce the likelihood of developing health issues associated with a sedentary lifestyle. The app's comprehensive approach to promoting proper posture and regular exercise makes it a valuable tool for enhancing overall health and well-being, ensuring a more balanced and active workday for users.

In this study, the SitMate mobile application did not demonstrate a significant reduction in prolonged sitting-related discomfort scores on the CMDQ among the BPO workforce management personnel after 1 month of intervention. However, the researchers recommend further investigation by assessing the ergonomics of the participants and ensuring consistent usage of the application throughout the entire research protocol. The limited number of participants in the study was influenced by factors such as the availability of participants and the prevalence of the current work-from-home setup, which made recruitment challenging.

To achieve more robust results, future studies should focus on recruiting a minimum computed sample size of individuals who are prone to prolonged sitting for 2 ½ hours or more. Additionally,

ensuring consistent usage of the SitMate application throughout the intervention period will provide a clearer understanding of its impact on reducing discomfort and promoting healthier sitting habits among BPO workforce management personnel. By addressing these considerations, future research may yield more conclusive and beneficial findings regarding the effectiveness of SitMate in mitigating prolonged sitting-related discomfort in the context of a remote work environment.

Acknowledgements

The researchers would like to express their deepest appreciation to their fellow research members, especially Abraham A. Teodoro and Olivia Jacqueline L. Ong, and the participants in this study, each of whom provided great contributions throughout the study. Additionally, the researchers would like to acknowledge research coordinators Ma'am Anna Lugue and Sir Warrick Sy from the faculty of CAReS UERMMMCI for their support and guidance. Lastly, the researchers are thankful to the mobile application development team and its members, Janley, Lloyd and Markton. The creation of the SitMate App would be impossible without the talent of these developers.

Support/Funding

The study was supported by a grant from the University of the East Ramon Magsaysay Memorial Medical Center Inc.

Conflict of interest declaration

The researchers declare that the study has no existing conflict of interest.

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A quasi -experimental study on the effects of a breastfeeding reminder system on breastfeeding in two tertiary medical centers

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Abstract

Introduction In the face of unchanging high rates of stunting among 12-23 months old Filipino babies, sustaining exclusive breastfeeding up to 6 months old remains a challenge. This study determined the effect of a breastfeeding reminder system on breastfeeding.

Methods This is a quasi-experimental study. Mothers were regularly given breastfeeding reminders by SMS and phone call. The weight, body length, episodes of upper respiratory tract infection and diarrhea were compared between the babies who were given exclusive breastfeeding and those whose exclusive breastfeeding was not sustained. Pearson Chi – square test and t-test at p=0.05 determined significance of differences of variables.

Results From March- October 2020, there were 450 babies included in the study. Of these babies, 44.8% were given exclusive breastfeeding up to 6 months. Timely initiation of breastfeeding was practiced by 91.95% of the mothers in the study. Babies who did not receive exclusive breastfeeding were shorter than those who received exclusive breastfeeding at 1 year old (70.11cm +2.78 vs.75.47cm +1.41, p<0.001) and at 2 years old (80.89 cm +2.30 vs. 87.29cm +1.47, p<0.001). At 2 years old, babies who received exclusive breastfeeding had no episodes of diarrhea and minimal (2%, p<0.001) episodes of acute respiratory infections.

Conclusion Due to the implementation of the reminder system, the percentage of babies exclusively breastfed up to 6 months of age increased to 44%. This is a significant improvement compared to a previous study where only 29% of the babies were exclusively breastfed.At one and two years old, babies who were not exclusively breastfed had stunting, weighed less and had more infections (diarrhea and URTI).

Key words: exclusive breastfeeding, infants, stunting

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According to the World Health Organization's 2018 Report on Infant and Young Child Feeding, optimal breastfeeding is of utmost importance, as it has the potential to save the lives of over 820,000 children under the age of 5 years annually.[1,2] This significance is evident in the context of declining under-five mortality rates over the past 15 years; however, neonatal mortality has not seen the same level of reduction. Neonatal deaths still account for 45% of all under-5 deaths, highlighting the importance of focusing on breastfeeding practices to address this issue.[3,4]

The benefits of exclusive breastfeeding up to 6 months of age are vast and encompass various aspects. In the WHO publication reviewing current scientific knowledge on exclusive breastfeeding, it highlights that this practice fosters essential interaction and bonding between mother and baby, particularly during a critical period in early brain development. During this time, the combination of optimal nourishment, positive stimulation, and attentive care can significantly enhance the formation of neural pathways in the developing brain.[5] Moreover, there is compelling evidence indicating that anything other than exclusive breastfeeding increases the risk of overweight and obesity. This underscores the importance of promoting exclusive breastfeeding as a crucial factor in supporting the long-term health and well-being of infants.[6]

Despite extensive evidence highlighting the vital importance of breastfeeding for infant and early child health, there have been only modest improvements in breastfeeding rates in the country over the last decade. A significant concern lies beyond the neonatal period, as the numbers remain discouraging, with 3 out of 5 infants under 6 months of age not receiving the protective benefits of exclusive breastfeeding. This situation underscores the urgent need for targeted interventions and increased awareness to promote exclusive breastfeeding and improve the overall health outcomes of infants in the country.[1]

Aligned with the strategic thrust of promoting breastfeeding during the first 6 months of life and appropriate introduction of complementary feeding at 6 months old, another key strategic focus is the intensified mobilization of local government units (LGUs). This approach aims to strengthen support and engagement from local authorities in implementing and advocating for breastfeeding initiatives, creating an enabling environment for mothers and families to practice exclusive breastfeeding and optimal complementary feeding practices. By collaborating with LGUs, enhance awareness, accessibility, and sustainability of breastfeeding programs can be enhanced further and improve the overall health and well-being of infants and young children in the community.[7]

As the local government units (LGUs) undergo capacity building and mentoring on nutritional program management to become self-propelling, it is essential to address the need for additional support from a tertiary government hospital to augment the programs directed towards the LGUs. In fact, another crucial strategic thrust is the complementation of actions between the national and local governments. By fostering collaboration between a tertiary government hospital and the LGUs, the overall impact of nutritional programs can be strengthened. The hospital can provide specialized expertise, resources, and technical assistance to further enhance the LGUs' efforts in promoting and implementing breastfeeding and nutritional initiatives effectively. This synergistic approach will empower both levels of government to work together towards a common goal of improving maternal and child health outcomes and creating a healthier future for the community.[7]

The PPAN 2017-2022 places significant importance on addressing malnutrition in 38 priority areas, with the northern NCR or CAMANAVA region being identified as one such priority area.[7]

The study consists of two primary sites. The first site is a tertiary government hospital located within the CAMANAVA area, which covers the cities of Caloocan, Malabon, Navotas, and Valenzuela. Notably, this area has been identified as a priority area in the PPAN 2017-2022, emphasizing its significance in addressing malnutrition. The second site is a private tertiary medical center situated in the northern NCR, geographically adjacent to the CAMANAVA region.

Therefore, this study aimed to enhance the existing breastfeeding programs of local government units by providing additional support to promote timely breastfeeding initiation right after delivery. To bolster exclusive breastfeeding practices up to 6 months of age, a reminder system was implemented using various communication channels such as SMS, viber messaging, and voice calls. Beyond 6 months, the reminders emphasized complementary feeding while continuing breastfeeding. It is worth noting that this approach is not a novel concept, as the World Health Organization (WHO) recognizes the effectiveness of telephone counseling and other technological interventions as valuable adjuncts. Such strategies empower not only end-users but also health workers and lay or peer counselors, contributing to more successful and sustained breastfeeding practices within the community. By leveraging these proven methods, the study aimed to further improve breastfeeding rates and ultimately enhance the nutritional status and

health outcomes of infants and young children in the study area.[8]

This study determined the effects of a breastfeeding support program by telephone counselling encounters in two tertiary medical centers on breastfeeding rate with the following specific objectives:

1. identified the demographics of the mothers in the study population.
2. determined the rate of timely breastfeeding initiation among the study population.
3. determined the effect on breastfeeding rate of telephone counselling encounters on mothers who were able to sustain exclusive breastfeeding for 6 months and those who were not able to sustain exclusive breastfeeding (EBF).
4. compared the weight and height and weight for height at 1 year and 2 years old of infants who had EBF and did not have EBF up to 6 months
5. compared the rate of acute upper respiratory tract infections and acute diarrhea in infants at 1 year and 2 years old between the two groups (those who had EBF and did not have EBF up to 6 months)

Methods

This is a quasi-experimental study that focused on term babies born between March and September 2020 in two hospitals, with a follow-up period until the children reached 2 years of age. The hospitals involved in the study included a tertiary government medical center and a private tertiary hospital located in close proximity to each other. Ethical approval for the study was obtained from the ethics committees of both hospitals to ensure the protection and well-being of the participants.

All mothers who had uncomplicated deliveries at the two medical centers were included in the study. After obtaining written informed consent, relevant maternal data were collected, including age, parity, BMI, educational attainment, and employment status. For neonates, birth weight and Z scores were recorded.

During the first 6 months of infancy, mothers received reminders or wellness checks via telemedicine twice a month. These reminders focused on encouraging exclusive breastfeeding continuation, timely immunization, and monitoring for any episodes of respiratory tract infections or diarrhea. After the 6-month mark, monthly wellness checks through telemedicine continued, aimed at supporting mothers in sustaining both breastfeeding and appropriate complementary feeding based on the child's age. Additionally, these check-ins encompassed monitoring immunization schedules and recording weight and body length or height during immunization visits to local health centers. The wellness checks also involved inquiring about any episodes of respiratory tract infections or diarrhea.

The use of telemedicine for wellness checks was considered standard of care for follow-up of infants born during the data collection period. This approach was adopted due to limitations brought upon by the pandemic, such as lack of public transportation and surges in COVID-19 admissions at the institutions. Only asymptomatic or well infants were included for the wellness checks, ensuring a focus on maintaining the health and safety of the participants. Mothers were instructed to contact the researchers for any health-related concerns related to their babies.

By incorporating telemedicine for wellness checks, the study aimed to provide essential support to mothers and monitor infant health closely during a challenging period, ultimately contributing to better maternal and child healthcare outcomes within the context of the pandemic.

Chi-square and t-tests were employed to assess significant differences between babies who received exclusive breastfeeding and those who did not, with a significance level (α) set at 0.05 for categorical and continuous variables, respectively. The data analysis was performed using SPSS version 23

Results

The study included a total of 450 babies. Among them, 202 babies (44.8%) received exclusive breastfeeding (EBF) for 6 months, while 248 babies (55.1%) did not. As depicted in Table 1, the mothers in both groups showed comparability in terms of age, BMI, parity, educational attainment, and employment status. Additionally, the babies' birthweights were comparable, even when categorized based on appropriateness for gestational age. Furthermore, timely initiation of breastfeeding was found to be comparable (p=0.141) in both groups, with an average of 91.95%.

Table 2 presents the Z scores of the two groups, which were obtained using the growth charts provided

Table 1. Demographics of mothers who were able to sustain exclusive breastfeeding (EBF) and who were not able to sustain exclusive breastfeeding (EBF).

Demographics	EBF Sustained, Numbers (%)	EBF Not Sustained, Number (%)	p value
Age of mother (Mean,+ SD)	26.12 + 5.99	26.10 + 5.80	0.976*
BMI (Mean,+ SD)	23.28+3.68	23.36 + 3.80	0.825*
Parity (%)			
1	94 (48.5)	104 (43.9)	0.439*
2	65 (33.5)	79 (33.3)	
≥ 3	35 (18)	54 (22.8)	
Mother's educational attainment			
Elementary	8 (4.1)	9 (3.8)	0.202*
High School	94 (48.5)	124 (52.3)	
College	92 (47.4)	104 (43.9)	
Mothers who are regularly working			
Fulltime	135 (69.9)	164 (69.2)	<0.001**
Parttime	50 (25.9)	33 (13.9)	
Unemployed	8 (4.1)	40 (16.9)	
Birth weight (Mean,+ SD)	2.91 +0.38	2.92+ 0.39	0.741*
AGA 0 Z score	167 (86.1)	205 (86.5)	0.991*
SGA (low Z score)	15 (7.7)	18 (7.6)	0.991*
LGA	12 (6.2)	14 (5.9)	
Timely initiation of breastfeeding	189 (93.6)	224 (90.3)	0.141*

*t test
** Pearson Chi square

by the World Health Organization (WHO) for males and females. These Z scores served as a reference for assessing the infants' growth and development. Z scores falling within the range of -1 to +1 were classified as normal, indicating healthy growth. Z scores equal to or below -2 were categorized as low, indicating potential growth restriction, while Z scores equal to or above +2 were classified as high, suggesting possible accelerated growth.

Based on the analysis of mean body length or height for age at 1 year, babies who did not receive exclusive breastfeeding exhibited lower Z scores compared to babies who received exclusive breastfeeding (70.114 + 2.78 vs. 75.47 + 1.41, $p < 0.001$). This trend persisted at 2 years of age, with babies who did not receive exclusive breastfeeding having lower Z scores (80.89 + 2.30) compared to those who received exclusive breastfeeding (87.29 + 1.47, $p < 0.001$).

Furthermore, a higher percentage of babies who did not receive exclusive breastfeeding had low Z scores compared to those who received exclusive breastfeeding. At 1 year old, 89.4% of babies who did not receive EBF had low Z scores, whereas only 2.6% of babies who received exclusive breastfeeding had low Z scores ($p < 0.001$). At 2 years old, 98.7% of babies who did not receive EBF had low Z scores, while none of the babies who received exclusive breastfeeding had low Z scores ($p < 0.001$).

These findings indicate a significant association between exclusive breastfeeding and better growth outcomes in terms of body length or height for age at both 1 year and 2 years of age. Babies who received exclusive breastfeeding showed higher Z scores and a lower prevalence of low Z scores, emphasizing the importance of exclusive breastfeeding in promoting optimal growth and development during the first two years of life.

Based on the analysis of mean body weight at 1 year old, babies who did not receive exclusive breastfeeding exhibited lower Z scores compared to

Table 2. Z-scores of babies given exclusive breastfeeding (EBF) and who were not given exclusive breastfeeding (EBF) using weight for age at 1 and 2 years old, height for age at 1 and 2 years old, and weight for height (WHZ) at 1 and 2 years old.

Demographics	EBF Sustained, numbers (%) 202	EBF Not Sustained, number (%) 248	p value
Body Length at 1 year	75.47+1.41	70.114+2.78	<0.001
Z score normal	189 (97.4)	25 (10.5)	<0.001
Z score low	0 (0.5)	211 (89)	
Z score high	4 (2.1)	1 (0.4)	
Body length at 2 years	87.29+1.47	80.89+2.30	<0.001
Z score normal	194 (100)	3 (1.3)	<0.001
Z score low	0	234 (98.7)	
Z score high	0	0	
Weight at 1 year old (kg+sd)	9.35+0.56	7.14+0.54	<0.001
Z score normal	194 (100)	0	<0.001
Z score low	0	237 (100)	
Z score high	0	0	
Weight at 2 years old (kg+sd)	14.08+12.02	8.85+0.52	<0.001
Z score normal	194 (100)	3 (1.3)	<0.001
Z score low	0	234 (98.7)	
Z score high	0	0	
WHZ Z score at 1 year old			
Z score normal	194 (100)	169 (71.3)	<0.001
Z score low	0	68 (28.7)	
Z score high	0	0	
WHZ Z score at 2 years old			
Z score normal	194 (100)	3 (1.3)	<0.001
Z score low	0	234 (98.7)	
Z score high	0	0	

babies who received exclusive breastfeeding (7.14 cm + 0.54 vs. 9.35 cm + 0.56, $p < 0.001$). This difference remained significant at 2 years old, with babies who did not receive exclusive breastfeeding having lower Z scores (8.85 cm + 0.52) compared to those who received exclusive breastfeeding (14.08 cm + 12.02, $p < 0.001$).

At 1 year old, all babies with low Z scores were those who did not receive exclusive breastfeeding, while none of the babies who received exclusive breastfeeding had low Z scores (100% vs. 0%, $p < 0.001$). At 2 years old, the majority of babies with low Z scores were those who did not receive exclusive breastfeeding, with only a negligible percentage having low Z scores among those who received exclusive breastfeeding (98.7% vs. 0%, $p < 0.001$).

A significant difference in weight-for-height Z score (WHZ) at 1 year old was observed between the two groups, with babies who received exclusive breastfeeding having a higher percentage of normal WHZ scores compared to those who did not (100% vs. 71.3%, $p < 0.001$). Similarly, at 2 years old, only 1.3% of babies who did not receive exclusive breastfeeding had a normal WHZ score, while all babies who received exclusive breastfeeding had a normal WHZ score ($p < 0.001$).

Table 3 reveals the notable increase in the rate of acute upper respiratory tract infections among babies who did not receive exclusive breastfeeding compared to those who had exclusive breastfeeding. At 6 months old, 8% of babies who did not receive exclusive breastfeeding experienced acute upper respiratory tract infections ($p < 0.001$). Similarly, at 12 months old, 7.6% of babies who did not receive exclusive breastfeeding had acute upper respiratory tract infections ($p < 0.001$).

While the rate of infections appeared comparable at 18 months old ($p = 0.070$), there was a significant

increase (p = 0.047) in the incidence of infections among babies who were not given exclusive breastfeeding.

Table 4 presents a striking finding, demonstrating the complete absence of acute diarrhea in all age groups included in this study among babies who received exclusive breastfeeding (p = 0.001). In comparison, babies who did not receive exclusive breastfeeding exhibited a higher incidence of acute diarrhea.

Discussion

The goal of ending preventable child deaths and reducing neonatal mortality to at least 12 per 1,000 live births highlights the urgent importance of ensuring that all newborns are breastfed within the first hour of life.[2] Successful exclusive breastfeeding necessitates early initiation of breastfeeding, meaning breastfeeding should commence within 1 hour of birth. Early initiation of breastfeeding is crucial as it serves as a protective measure for the newborn, reducing the risk of infections and decreasing newborn mortality rates. By promoting and prioritizing early initiation of breastfeeding, there can be significant strides towards achieving these vital healthcare objectives and securing better health outcomes for newborns.[9,10]

Thus, "The Every Newborn Action Plan" was introduced as a comprehensive initiative that recognizes the critical role of early initiation of breastfeeding in reducing preventable neonatal mortality.[11] This action plan aims to tackle a significant issue, as in 2015, out of 140 million live births, only 45% of newborns were breastfed within the first hour of life. By emphasizing and prioritizing early initiation of breastfeeding in its road map and joint action platform, this initiative seeks to address this alarming statistic and promote the well-being of newborns worldwide. By encouraging early breastfeeding initiation, newborns can be provided with essential nutrients, immunity, and protection against infections, ultimately contributing to a substantial reduction in neonatal mortality rates and ensuring a healthier start to life for every baby.[11,12]

The barriers to the simple yet cost-effective approach of early initiation of breastfeeding are diverse, with cultural norms and traditions being one of the foremost challenges. This aspect holds particular significance as multi-cultural communities are being served. Addressing and overcoming these barriers are crucial to improving neonatal health and well-being. McKenna, et al. observed that traditional beliefs in certain communities consider colostrum as dangerous, leading to its wastage instead of recognizing its vital nutritional benefits for newborns. In other settings, cultural practices involve feeding newborns tea, butter, sugar water, honey, or animal

Table 3. Rate of acute upper respiratory tract infections among babies who had exclusive breastfeeding (EBF) and whose exclusive breastfeeding (EBF) were not sustained by single age (in weeks).

Age	EBF Sustained, numbers (%) With AURI	EBF Not Sustained, number (%) With AURI	p value*
6 mos	0 (0)	19 (8)	<0.001
12 mos	0	18 (7.6)	<0.001
18 mos	2 (1)	9 (3.8)	0.070
24 mos	4 (2.1)	14 (5.9)	0.047

*Pearson Chi-square

Table 4. Rate of acute diarrhea or loose bowel movement among babies who had exclusive breastfeeding (EBF) and whose exclusive breastfeeding (EBF) were not sustained by single age (in weeks).

Age	EBF Sustained, numbers (%) With LBM	EBF Not Sustained, number (%) With LBM	p value*
6 mos	0 (0)	12 (5.1)	0.001
12 mos	0 (0)	17 (7.2)	<0.001
18 mos	0 (0)	8 (3.4)	0.010
24 mos	0 (0)	11 (4.6)	0.002

milk before they are breastfed, which can interfere with the early initiation of breastfeeding and deprive infants of the essential nutrients and immune protection found in colostrum.[13] To promote early initiation of breastfeeding successfully, it is essential to work collaboratively with communities, understanding and respecting their cultural beliefs and practices. Engaging in culturally sensitive approaches and raising awareness about the benefits of early breastfeeding initiation, help dispel misconceptions and traditional barriers, ultimately fostering healthier practices for newborns and contributing to the reduction of preventable neonatal mortality.

In the 2018 Expanded National Nutrition Survey (ENNS) conducted by the Department of Science and Technology Food and Nutrition Research Institute, it was found that the rate of early or timely initiation of breastfeeding in 2018 was 69.2%. This percentage was significantly higher ($p < 0.05$) than the rate of 65.1% recorded in 2015, but lower than the rate of 77.1% obtained in 2013.[14,15] In the current study, the average rate of timely initiation of breastfeeding was notably higher at 91.95%. Additionally, the rate of babies who were eventually given exclusive breastfeeding for 6 months was higher than those who did not, although the difference was not statistically significant (93.6% vs. 90.3%, $p = 0.141$). These findings suggest that there has been progress in improving the rate of timely initiation of breastfeeding in recent years, but there is still room for further improvement to match or exceed the rates achieved in 2013. Additionally, although there was a higher proportion of babies receiving exclusive breastfeeding for 6 months in this study, the difference compared to those who did not receive exclusive breastfeeding was not statistically significant. This highlights the need for continued efforts to promote and support exclusive breastfeeding practices for improved infant health and development.

After timely initiation of breastfeeding, sustaining exclusive breastfeeding becomes crucial due to compelling reasons. Studies, such as the one conducted by Sankar, have shown that in low- and middle-income countries, infants who receive mixed feeding (introduction of foods and liquids other than breastmilk before 6 months) face up to 2.8 times higher mortality risk than those who are exclusively breastfed. The risk of mortality is even higher among infants who are not breastfed at all, as they face a staggering 14-fold higher risk of death when compared to their exclusively breastfed counterparts.[16]

Sadly, the 2016 UNICEF Global Database on breastfeeding reported that in 2015, only 31% of infants received exclusive breastfeeding from 0-6 months old.[2] This highlights the need to increase efforts to promote and support exclusive breastfeeding in early infancy.

In this study, at 6 months old, 44.8% of babies received exclusive breastfeeding alongside complementary feeding in addition to breastmilk. This marked increase in breastfeeding rate is noteworthy when compared to the 2018 report from the Food and Nutrition Research Institute (FNRI) on the Nutritional Status of Filipino Infants and Young Children 0-23 months, which indicated a breastfeeding rate of 29% at 5.9 months.[15] Despite the improvements, it appears that gains in breastfeeding rates are modest and not sustained substantially, as evidenced by similar data from previous nationwide surveys.

These findings emphasize the need for continuous and comprehensive efforts to encourage exclusive breastfeeding practices, addressing cultural barriers, and enhancing support systems to achieve better health outcomes for infants and young children. Promoting and sustaining exclusive breastfeeding up to 6 months of age and beyond can play a critical role in reducing infant mortality and improving overall child health.

The Department of Health National Nutrition Council's Philippine Plan of Action for Nutrition (PPAN) 2017-2022 Executive Summary identifies the low rate of exclusive breastfeeding as a key nutrition problem that needs to be addressed. Sub-optimal breastfeeding practices contribute to these low rates, depriving infants of the essential nutrients required for optimal growth during their most rapid growth phase.[7] To combat this issue, the PPAN 2017-2022 sets intermediate outcome targets, one of which is to increase the prevalence of exclusive breastfeeding among infants aged 5 months old. The goal is to raise the prevalence from 24.7% in 2015 to 33.3% by the year 2022. The Executive Summary of the Philippine Plan of Action for Nutrition 2017-2022 highlights another concerning issue - high levels of stunting and wasting among children under-five years of age. These levels have remained largely unchanged over the years. In 2014, the prevalence of stunting in children under 5 years old was 33.4%.[7] Unfortunately, this situation has barely improved, as evidenced by the 2018 Expanded

National Nutrition Survey (ENNS) conducted by the Department of Science and Technology Food and Nutrition Research Institute, which reported a stunting rate of 36.6% among infants aged 12-23 months.[15]

These statistics emphasize the need for continued efforts and interventions to address the persistent problem of stunting in young children. Stunting can have long-term adverse effects on physical and cognitive development, and addressing this issue is crucial to ensuring the healthy growth and development of the nation's future generations. By prioritizing and implementing targeted measures to combat stunting, the Philippine Plan of Action for Nutrition aims to make significant progress in improving child nutrition and reducing the prevalence of stunting among young children in the country.

The findings of this study align with the broader issue of stunting in young children due to non-exclusive breastfeeding. Babies who did not receive exclusive breastfeeding exhibited stunting at both 1 year and 2 years old, with a significantly higher percentage affected compared to those who were exclusively breastfed at the same age groups (89% and 98.7% vs. 0.5% and 0%, $p < 0.001$, respectively).

Moreover, the mean height Z scores for both age groups among the non-exclusively breastfed babies were observed to be -2, indicating a negative impact on their growth and development.

In addition to stunting, wasting was also present in the non-exclusively breastfed group, as indicated by Z scores of -2 for weight and weight for height (WHZ) scoring.

These results underscore the critical role of exclusive breastfeeding in promoting healthy growth and development in young children. Non-exclusive breastfeeding is associated with an increased risk of stunting and wasting, which can have long-term consequences on a child's overall health and well-being. The study highlights the importance of supporting and encouraging exclusive breastfeeding practices to ensure optimal nutrition and health outcomes for infants during their early years of life.

Therefore, it is highly advisable to adapt the World Health Organization's (WHO) guidelines on counseling women to improve breastfeeding practices. These guidelines advocate for the provision of at least six breastfeeding counseling contacts, which allow for comprehensive support to breastfeeding mothers and their families. The counseling should commence during the antenatal period and continue throughout the various stages of breastfeeding and introduction of complementary feeding.[8]

The minimum of six breastfeeding counseling contacts may occur at the following time points:

1. Before birth (antenatal period)
2. During and immediately after birth (perinatal period up to the first 2–3 days after birth)
3. At 1–2 weeks after birth (neonatal period)
4. In the first 3–4 months (early infancy)
5. At 6 months (at the start of complementary feeding)

These counseling contacts play a crucial role in educating and supporting mothers, enabling them to overcome challenges and establish successful breastfeeding practices. By providing continuous guidance and assistance at various stages, breastfeeding mothers can receive the necessary encouragement and information to ensure optimal breastfeeding outcomes. Implementing these WHO guidelines can contribute significantly to enhancing breastfeeding rates and promoting better health for both infants and mothers.

The higher rate of respiratory tract infections and diarrhea observed among non-exclusively breastfed babies ($p < 0.001$) is a significant contributing factor to the issue of malnutrition in the early years of life.[17] Poor infant and young child feeding practices during the first two years, combined with recurrent bouts of infection, can help explain the elevated levels of stunting.[7]

Respiratory tract infections and diarrhea are common illnesses in young children, and non-exclusive breastfeeding can compromise their immune system, making them more susceptible to these infections. Additionally, inadequate nutrition due to suboptimal feeding practices further weakens their immune response and overall health. The combination of frequent infections and inadequate nutrition can lead to malnutrition, which, in turn, contributes to stunted growth in children.

Addressing the problem of non-exclusive breastfeeding and promoting proper infant and young child feeding practices is crucial to break this cycle and reduce the burden of stunting. Providing comprehensive support for exclusive breastfeeding and appropriate complementary feeding, along with

measures to prevent and manage infections, can significantly improve the nutritional status and overall health of infants and young children, ultimately reducing the prevalence of stunting and its associated long-term consequences.

Stunting is a prevalent issue, affecting 89% of babies at 1 year old and a significant 98% at 2 years old among those who did not receive exclusive breastfeeding. In contrast, at 2 years old, none of the babies who received exclusive breastfeeding had diarrhea, and only a minimal 2% experienced acute respiratory infections. These findings highlight the crucial role of exclusive breastfeeding in promoting better health outcomes for infants, reducing the risk of infections, and potentially preventing stunting.

To address this concern effectively, it is recommended to prioritize maternal education on breastfeeding practices during the antenatal period. Equipping expectant mothers with knowledge and skills about breastfeeding can positively influence their attitudes and practices, laying a strong foundation for successful breastfeeding experiences.

Additionally, providing continuous follow-up and support through breastfeeding counseling up to 6 months can prove instrumental in helping mothers navigate the challenges they may encounter during the breastfeeding journey. This personalized guidance and encouragement can play a vital role in sustaining exclusive breastfeeding and fostering a nurturing and nourishing environment for both mother and child.

By incorporating maternal education and ongoing counseling, healthcare providers can empower mothers to make informed choices about breastfeeding and ensure the well-being of infants, leading to improved nutrition, reduced infections, and a potential decrease in stunting prevalence. These interventions collectively contribute to the overall health and development of infants and set them on a path towards a healthier future.

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A correlational study of burnout, compassion fatigue, and moral injury related to resilience of nurses in COVID-19 wards of a public hospital in Metro Manila

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Abstract

Introduction Increased healthcare demands due to the COVID-19 pandemic have overwhelmed nurses worldwide. Resilience of nurses has been impacted due to many factors (e.g., longer work shifts) causing psychological distress. The study aimed to determine the correlation of burnout, compassion fatigue, and moral injury with resilience among nurses assigned in COVID-19 wards.

Methods Virtual survey tools were sent to nurses of a public hospital to obtain data. Data were analyzed using JAMOVI and SPSS.

Results Levels of burnout showed moderate burnout in personal burnout (f=44) (65.7%); Moderate burnout in work-telated burnout (f=36) (53.7%); no/low level of burnout in client-related burnout (f=48) (71.6%). Level of compassion fatigue showed job burnout (f=59) (88.1%). Level of moral injury indicated "requiring clinical attention" (f=52) (77.6%). Level of resilience showed medium resilience (f=45) (67.2%). Correlation between burnout and resilience yielded negligible negative correlations between personal burnout and resilience (r=-0.160, p=0.031), work-related burnout and resilience (r=-0.222, p=0.008), and client-related burnout and resilience (r=-0.120, p=0.741). Correlation yielded weak negative correlations between compassion fatigue and resilience (r=-0.254, p=0.038) and between moral injury and resilience (r=-0.318, p=0.009). The linear regression showed no significant correlations between personal burnout and resilience (p=0.063), work-related burnout and resilience (p=0.070), client-related burnout and resilience (p=0.331), compassion fatigue and resilience (p=0.080), moral injury and resilience (p=0.227).

Conclusion The findings showed significant correlations between personal burnout and resilience, work-related burnout and resilience, compassion fatigue and resilience, and moral injury and resilience. There were no significant correlations between client-related burnout and resilience. Multiple linear regression indicated burnout, compassion fatigue, and moral injury are not predictive factors for resilience.

Key words: Resilience, burnout, compassion fatigue, moral injury

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Dr. Fernando S. Sanchez Research and Publication awardee, 24th Annual Research Forum, UERMMMCI Research Institute for Health Sciences, November 23, 2022

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The COVID-19 pandemic has resulted in major healthcare crises in many countries leading to psychological stress among health care workers (HCW).[1] At the time of the study, there were 2,698,232 COVID-19 cases in the Philippines of which 26,566 were HCWs. There were 106 (0.4%) deaths among HWCs and 228 (0.9%) remained as active cases. According to a study, nurses are more likely to contract COVID compared to other HCWs due to their direct and frequent contact with their clients.[2] With the outbreak of the delta variant, it has also aggravated the lack of staff and inadequate nurse-patient ratio.[3]

A meta-analysis showed that HCWs experienced stress (40%), anxiety (28%), burnout (28%), depression (28%), and posttraumatic stress (13%).[4] These are due to a variety of factors, such as extended hours in their shifts to cater the greater demands of healthcare during the pandemic. More psychological issues among HCWs have been shown to be triggered by inadequate support from the public, government, and administration, diminished sleep, prolonged separation from families and friends, the fear of transmitting COVID-19 to relatives and colleagues, and being in close proximity to patients in COVID-19 wards.[5] Factors such as high transmission of COVID-19, lack of mass testing, scarcity of personal protective equipment and supplies for healthcare professionals, and perceptions in the community have also added to their stress.[6] The whole situation has put HCWs, especially nurses, at a higher risk of experiencing burnout, compassion fatigue, and moral injury.

Burnout among nurses in 49 countries was at 11.2 percent and was associated with sociodemographic (age, sex, educational level, degree), social (perceived threat of COVID), and occupational (high-risk environment) factors.[7] Compassion fatigue is closely related to burnout as it involves depersonalization, worn-out emotional states, and an absent feeling of self-fulfillment. The protracted pandemic, forcing HCWs and nurses to provide care for a long period of time has placed them at risk for developing compassion fatigue.[8] Nurses who have witnessed firsthand the agony and torment of their patients and co-workers may develop moral injury. A study revealed that nurses have been shown to be negatively influenced by personal views that their institutional guidelines were unfair, and their supervisors acted and continued to act unjustly towards them.[9] A previous study found that nurses' ability to cope with psychological threats was determined by their resilience.[10] Resilience was found to be an important mediator in reducing the negative impact of burnout, compassion fatigue, and moral injury, such as the nurses' capacity to deliver their nursing interventions.[11]

The study aimed to determine the correlation of burnout, compassion fatigue, and moral injury with resilience among nurses assigned in COVID-19 wards of a public hospital in Metro Manila.

Methods

The study utilized a descriptive correlational design to describe and examine the correlation between and among burnout, compassion fatigue, and moral injury as independent variables and resilience as dependent variable. The study was conducted at a COVID-19 referral center public hospital in Metro Manila with the capacity to accommodate up to 116 patients. The staff consisted of 84 nurses who went on 12-hour shifts. Participants were selected by convenience sampling and those who agreed to participate and gave their informed consent were asked to answer the Copenhagen Burnout Inventory, Compassion Fatigue Short Scale, Moral Injury Symptom Scale-Health Professional Version, and the Brief Resilience Scale.[12-15] The study was approved by the UERMMMCI Research Institute for Health Sciences Ethics Review Committee (RIHS ERC Code 1189/C/2021/269, approved April 18, 2022).

The eligible participants for the study were regular and full-time nurses who had worked or were currently working for at least six months in the COVID-19 wards of the identified hospital. Additionally, they needed to be willing to participate in the study and have the ability to read and communicate in English. Participants who had COVID-19 or any physical or mental health condition were excluded from the study. Additionally, nurses who requested to discontinue filling up the survey questionnaires were withdrawn from the analysis. The sample size of 67 respondents was determined using G*Power software, with the following parameters: a confidence level (α) of 0.05 (95% confidence level) and a statistical power of 0.75. There were four assessment instruments utilized in this study - Copenhagen Burnout Inventory (CBI), Compassion Fatigue Short Scale (CF-Short Scale), Moral Injury Symptom Scale-Health Professional (MISS-HP) Version, and Brief Resilience Scale (BRS).[12-15] The researchers secured permission from the authors of these assessment instruments to utilize their questionnaires. The Copenhagen Burnout Inventory (CBI) is a 19-item instrument using a 5-point Likert scale that measures burnout in three dimensions or subscales: personal, work-related, and client-related burnout.[12] From always = 100 to never = 0, the response items are graded on a scale of 100, 75, 50, 25, and 0. The items within a subscale are averaged. The total score is the average of the scores on the items. Burnout is classified as low (< 50), moderate (50 to 74), high (75 to 99), and severe (100). The lower scores indicate a lower level of burnout. If less than

three questions were answered, the respondent was classified as non-responder.

The Compassion Fatigue Short Scale (CF-Short Scale) is a 13-item questionnaire that consists of the following domains: an 8-item burnout subscale and a 5-item secondary trauma subscale.[13] Each item is scored on a 10-point Likert scale (1 = rarely/never to 10 = very often). The scores may range from 13 to 130; a higher score denotes a higher level of compassion fatigue. A score of 15+ suggests that vicarious trauma may be present. A score of 30+ suggests that job burnout may be present.

The Moral Injury Symptom Scale: Healthcare Professionals Version (MISS-HP) is a 10-item questionnaire that assesses the 10 dimensions/ domains of MI: betrayal, guilt, shame, moral concerns, loss of trust, loss of meaning, difficulty forgiving, self-condemnation, religious struggle, and loss of religious faith.[14] MISS-HP provides visual analogues using a 10-point Likert scale ranging from 1 ("strongly disagree") to 10 ("strongly disagree") which will indicate how the respondent personally agrees or disagrees with each statement. All 10 items will create a total score ranging from 10 to 100; the higher the score, the greater the MI. Four items are scored reversely because of their positive wordings. Scores of 36 or higher are interpreted as an indication of MI symptoms causing moderate to extreme problems with family, social, and occupational functioning, and therefore require clinical attention.

The Brief Resilience Scale (BRS) is a 6-item questionnaire using a 5-point Likert scale which includes both positively and negatively worded items and was created to assess a unitary construct of resilience.[15] Positively worded items 1, 3, and 5 are contrasted with negatively worded items 2, 4, and 6. The BRS is scored by computing the mean of the six items. For the scoring, the responses are added varying from 1-5 for all six items giving a range from 6 to 30. The total is then divided by the total number of questions answered. Resilience is classified as very high (30-28), high (27-24), medium (23-18), low (17-13), and very low (12-6).

The scores from the four questionnaires of each respondent were encoded in Excel. The frequency distribution, mean, and standard deviation of scores per assessment tool were computed. Pearson correlation coefficient (r) was used to determine the correlation of three pairs of continuous variables: burnout and resilience, compassion fatigue and resilience, and moral injury and resilience. The predictive factor between one dependent continuous variable and two or more independent continuous variables, as well as the value of the dependent variable at a given value of the independent variable, was determined using multiple linear regression analysis. The coefficient of determination (r^2) was computed to determine the dependent variable's proportion of variance that the independent variable could explain; it estimated the relationship between movements of the dependent variable based on an independent variable. SPSS was used for the statistical analysis.

Results

Table 1 shows that 83.6% of 67 respondents had moderate to severe personal burnout, 73.1% had work-related burnout and 28.4% had client-related burnout. The mean scores for personal (61.1) and work-related burnout (57.2) were in the moderate level while that for client-related burnout was in the low level (39.3). Almost 9 of 10 respondents had compassion fatigue indicating job burnout and the rest had vicarious trauma. More than three-fourths of respondents had moral injury requiring clinical attention. Eight out of 10 participants had medium to high resilience while 16.4% had very low to low resilience. The mean resilience score was 3.4 (medium resilience).

Table 1 shows the levels of burnout, compassion fatigue, moral injury and resilience of nurses in the COVID-19 wards of a public hospital in Metro Manila. Level of burnout of COVID-19 ward nurses was determined by using the Copenhagen Burnout Inventory. Majority of nurses (65.7%) experienced moderate burnout under personal burnout; 53.7% experienced moderate burnout under work-related burnout; and, 71.6% experienced little to no burnout under client-related burnout.

Table 2 shows Pearson's correlation analysis for the following variables: burnout, compassion fatigue, and moral injury to resilience of nurses in the COVID-19 wards of a public hospital in Metro Manila. In three subscales of CBI, Pearson's r correlation coefficient identified negligible negative correlation between personal burnout and resilience ($r = -0.160$, $p = 0.031$), work-related burnout and resilience ($r=-0.222$, $p=0.008$), client-related and resilience ($r=-0.120$, $p=0.741$). The p-values for personal and work-related burnout rejected the null hypotheses, indicating there

Table 1. Levels of burnout, compassion fatigue, moral injury and resilience of burses in COVID-19 Wards.

Variables	Score	Interpretation	*f*	%	x̄	SD
Personal Burnout	100	Severe Level	1	1.5%	61.1	14.93
	75-99	High Level	11	16.4%		
	50-74.99	Moderate Level	44	65.7%		
	< 50	No/Low Level	11	16.4%		
Work-related Burnout	100	Severe Level	0	0.0%	57.2	17.44
	75-99	High Level	13	19.4%		
	50-74.99	Moderate Level	36	53.7%		
	< 50	No/Low Level	18	26.9%		
Client-Related Burnout	100	Severe Level	0	0.0%	39.3	16.48
	75-99	High Level	1	1.5%		
	50-74.99	Moderate Level	18	26.9%		
	< 50	No/Low Level	48	71.6%		
Compassion Fatigue	> 30	Indicates Job Burnout	59	88.1%	56.8	22.74
	15-29	Indicates Vicarious Trauma	8	11.9%		
Moral Injury	36-100	Requires Clinical Attention	52	77.6%	47.5	13.74
	10-35	Low Level	15	22.4%		
Resilience	5.0-4.67	Very High	0	0.0%	3.4	0.56
	4.50-4.00	High	11	16.4%		
	3.83-3.00	Medium	45	67.2%		
	2.83-2.17	Low	9	13.4%		
	2.00-1.00	Very low	2	3.0%		

is a significant correlation. Meanwhile, the p-value (p = 0.741) for client-related burnout accepted the null hypothesis, implying no significant association or correlation between client-related burnout and resilience. Table 2 shows that personal (r = -0.160, p = 0.003), work-related (r = -0.222, p = 0.008), and client-related burnout(r = -0.120, p = 0.741) had a negligible negative correlation with resilience.

Table 3 shows the linear regression analysis of burnout, compassion fatigue, and moral injury as predictive factors towards resilience of nurses in the COVID-19 wards of a public hospital in Metro Manila.

For the linear regression analysis of personal burnout and resilience, there was no significant correlation found between the two variables personal burnout and resilience (p = 0.063). This indicates that personal burnout was not a predictive factor of resilience. Specifically, results showed 0.009% decrease (regression coefficient = -0.009) in resilience for every one percent increase in personal burnout. Standard error of 0.005 showed how much variation there was around the estimates of the regression coefficient. For its regression statistics, the multiple R that calculates the quality of the prediction of the dependent variable (resilience), was determined to be 0.229. Meanwhile, R^2 value was 0.052, which indicates that the independent variable (personal burnout) explained 5.2% of the variability of the dependent variable (resilience). For the adjusted R^2, the value shown was 0.038; this lower adjusted R^2 meant additional variables were not providing any value to the regression model. Lastly, it had a standard error of 0.550, which was a measure of how far the data points deviated from the regression line on average. The spread of data values to the regression line decreased as the standard error decreased.

For the linear regression analysis of work-related burnout and resilience, there was no significant correlation between work-related burnout and resilience (p = 0.063). Work-related burnout is therefore not a predictive factor of resilience. Specifically, results showed 0.007% decrease (regression coeffiecient = -0.007) in resilience for every one percent increase in work-related burnout. Standard error of 0.003 showed how much variation

Table 2. Pearson's correlation coefficient analysis of burnout (personal burnout, work-related burnout, client-related burnout), compassion fatigue and moral injury related to resilience of nurses in COVID-19 wards.

Variables	Pearson's *r*	Interpretation	*p*	Decision	Interpretation
Personal Burnout - Resilience	-0.160	Negligible negative correlation	0.0031	Reject Ho_1	There is a significant relationship
Work-Related Burnout - Resilience	-0.222	Negligible negative correlation	0.008	Reject Ho_1	There is a significant relationship
Client-Related Burnout - Resilience	-0.120	Negligible negative correlation	0.741	Accept Ho_1	There is no significant relationship
Compassion Fatigue - Resilience	-0.254	Weak negative association	0.038	Reject Ho_2	There is a significant relationship
Moral Injury - Resilience	-0.318	Weak negative association	0.009	Reject Ho_3	There is a significant relationship

Table 3. Linear regression analysis of burnout, compassion fatigue and moral injury as predictive factors towards resilience of nurses in COVID-19 wards.

Variables	*p* Value	*β* Coef.	Std. Error	Multiple R	R^2	Adjusted R^2	Std. Error	Observations
Personal Burnout	0.063	-0.009	0.005	0.229	0.052	0.038	0.550	67
Work-Related Burnout	0.070	-0.007	0.003	0.222	0.050	0.035	0.551	67
Client-Related Burnout	0.331	0.004	0.004	0.121	0.015	-0.001	0.561	67
Compassion Fatigue	0.080	-0.005	0.003	0.215	0.046	0.032	0.552	67
Moral Injury	0.227	-0.006	0.558	0.150	0.022	0.007	0.558	67

there was around the estimates of the regression coefficient. For its regression statistics, the multiple R was at 0.222. For the Adjusted R^2, the value shown was 0.035; this lower adjusted R^2 indicates additional variables were not providing any value to the regression model. Lastly, it had a standard error of 0.551.

For the linear regression analysis of client-related burnout and resilience, the results revealed a high p-value (p = 0.331), thus, there is no significant correlation between client-related burnout and resilience found. In addition, client-related burnout was not a predictive factor of resilience. Specifically, results showed 0.004% increase (regression coeffiecient = 0.004) in resilience for every one percent increase in client-related burnout. For its regression statistics, the multiple R was determined to be 0.121. For the Adjusted R^2, the value was -0.001; this lower adjusted R^2 indicates additional variables were not providing any value to the regression model. Lastly, it had a standard error of 0.561.

For the linear regression analysis of compassion fatigue and resilience, there was no significant correlation between compassion fatigue and resilience (p = 0.080) therefore compassion fatigue is not a predictive factor of resilience. Specifically, results showed 0.5% decrease (regression coefficient = -0.005) in resilience for every one percent increase in compassion fatigue. Standard error of 0.003 showed how much variation there was around the estimates of the regression coefficient. At present, no literature supports or contradicts the results of the linear

regression analysis of moral injury as a predictive factor toward resilience among nurses in a public hospital. For its regression statistics, the multiple R was at 0.215. Meanwhile, R^2 value was 0.046, which indicates that personal burnout explained 4.6% of the variability in resilience. For the Adjusted R^2, the value shown was 0.032; this lower adjusted R^2 meant additional variables were not providing any value to the regression model. Lastly, it had a standard error of 0.552.

For the linear regression of moral injury and resilience, there was no significant correlation between moral injury and resilience ($p = 0.227$) therefore, moral injury was not a predictive factor of resilience. Specifically, results showed 0.006% decrease (regression coefficient = -0.006) in resilience for every one percent increase in moral injury. Standard error of 0.558 showed how much variation there was around the estimates of the regression coefficient. The multiple R was at 0.150. Meanwhile, R^2 value was 0.022, which indicates moral injury explained 2.2% of the variability in resilience. The value shown for Adjusted R^2 was 0.007, which indicates that additional variables were not adding any value to the regression model. Lastly, it had a standard error of 0.558.

Discussion

Level of compassion fatigue showed that 88.1% of nurses have scored 30 and above on the CF Short Scale, indicating that majority of them experienced job burnout. One study found that in crisis events, compassion fatigue and its accompanying symptoms are significant and likely problems for critical care nurses because the pressures to address and cope with the demand for healthcare sometimes outweigh the capability to fulfill it.[16] Data on compassion fatigue is significant because it can help alert healthcare institutions of the number of nurses in their COVID wards that are feeling less compassionate towards their clients.

Level of moral injury showed that 77.6% of nurses fall under the category of "requiring clinical attention" using the MISS-HP. This is aligned with a study which revealed that HCW in contact with COVID patients showed elevated sight of negative mental health symptoms.[17] Obtaining the status of moral injury will allow the hospital administrations with COVID wards to understand how many of their nurses' values and moral beliefs have been likely distressed.

Level of resilience showed that 69% of nurses experienced medium resilience. This is supported by a previous study that showed resilience as a significant mediator in preventing the negative impact of burnout, compassion fatigue and moral injury in the nurses' ability to deliver high-quality patient care.[11] Knowing their resilience status will aid the administration of various hospitals to understand that the COVID-19 pandemic has influenced the resilience of nurses down to medium levels, and that such data call for policy reform in each respective institution.

For the correlation between compassion fatigue and resilience, the Pearson's r ($r = - 0.254$) implies that there is a weak negative association between these two variables. This data is also supported by a study which revealed that levels of psychological resilience influenced the effects of compassion fatigue on nurse's work outcome and patient safety outcomes and therefore, further proving a relation between compassion fatigue and resilience.[18]

For the correlation between moral injury and resilience, it was found to have a weak negative association ($r=-0.318$). This finding is backed up by a study which found that increased stress among nurses resulted in poor decision-making and dissatisfaction with the care provided to their patients, resulting in a higher likelihood and frequency of moral injury, particularly for nurses working in COVID-19 wards with a high workload demand.[19]

There was no literature to support or oppose the findings of the linear regression analysis of moral injury as a predictor of resilience among nurses in a public hospital at the time of this writing.

Conclusion

This study explored the relationship between burnout, compassion fatigue, moral injury, and resilience among nurses working in COVID-19 wards. The results revealed variations in the correlations between these variables. Personal and work-related burnout showed a significant positive correlation with resilience, while there was no significant correlation between client-related burnout and resilience. The three subscales of burnout displayed a negligible negative correlation.

Regarding compassion fatigue and moral injury, both showed weak negative correlations with resilience, suggesting an inverse relationship. As

resilience increased, compassion fatigue and moral injury decreased, and vice versa, albeit to a weak extent. Multiple linear regression analysis indicated that burnout, compassion fatigue, and moral injury were not predictive factors for resilience among nurses in COVID-19 wards of a public hospital. Additionally, no confounding variables were found to affect this prediction.

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An analytical cross-sectional study on the relationship of perceived social connectedness and burnout symptoms in medical students from a private tertiary institution in Metro Manila enrolled in an online curriculum for the academic year 2020-2021

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Abstract

Introduction Online learning was put at the forefront for the safe continuation of education amid the COVID-19 pandemic. This study determined the association of the level of social connectedness and symptoms of burnout in a purely online academic curriculum.

Methods This analytical cross-sectional study design included medical students enrolled in a private tertiary institution in the National Capital Region as respondents in an online survey. The perceived social connectedness and symptoms of burnout were objectively measured, using previously validated questionnaires, the Social Connectedness Scale - Revised (SCS-R), and the Copenhagen Burnout Inventory (CBI). The prevalence risk ratio (PRR) was computed.

Results Of the 119 respondents, majority reported reduced levels of social connectedness (72.3%) and experienced symptoms of burnout (85.7%). Among those with reduced levels of social connectedness (PRR: 1.25; 1.00, 1.55), there was a higher risk of having symptoms of burnout.

Conclusion Amid the implementation of a purely online curriculum, medical students with reduced social connectedness had an increased risk of experiencing symptoms of burnout.

Key words: Social connectedness, burnout symptoms, online medical curriculum

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In March 2020, the World Health Organization (WHO) declared the novel-coronavirus 2019 (COVID-19) as a worldwide pandemic, and as a result, the Philippine government placed the entire country under lockdown.[1,2] Organizational restructuring and changes were forced upon many institutions, particularly medical schools, wherein the withdrawal of clinical clerks from hospitals and bedside teaching led to an abrupt transition to online learning. Various challenges and barriers to online learning (i.e., technical difficulties, inaccessibility to the internet and/or lack of stable internet connection,

sociopolitical and psycho-emotional family problems, and loss of belongingness in the student community) soon became evident and had negatively affected the attainment of learning outcomes in the traditional mode of teaching.[2] Stay-at-home and social distancing orders brought about by the pandemic also impeded social interaction, which increased the risk in negatively affecting belongingness.[3] Belongingness had always been integral to one's overall well-being; thus, its compromise could have potentially hampered success in online learning. Another dimension of strain to online learning was further added as some students felt isolated and distracted due to the development of anxiety, depression, loneliness and alienation which could be explained by the lack of belongingness and social connectedness.[3] The combination of drawbacks associated with online learning may have contributed to the onset of burnout, which is characterized by physical, mental, and emotional exhaustion resulting from excessive demands placed on individuals by various stressors. Burnout can manifest through symptoms such as increased fatigue, quickness to anger, heightened irritability, cynicism, reduced professional efficacy, and feelings of isolation, along with a diminished sense of accomplishment despite investing more time in work.[4-6] As the basic medical curriculum had long been regarded as a demanding course with increased mental and physical requirements, medical students might be at an increased risk of burnout syndrome. Medical students often resorted to inadequate coping mechanisms (e.g., sleep deprivation, loss of time for family and friends and physical exercise) to deal with the rigors of medical school to the detriment of their own health and career.[5,7,8] The recognition of the adverse effects on individuals experiencing burnout syndrome had drawn attention; hence, the Copenhagen Burnout Inventory (CBI) and Maslach Burnout Inventory (MBI) were created to determine the prevalence of burnout among individuals in the human service sector and the general population, respectively.[6,9]

As the COVID-19 pandemic brought about the need for social distancing and severely limited interaction, online learning had been placed at the forefront for the safe continuation of education in today's "new normal". Belongingness and social connectedness, which had been integral components to one's overall well-being, suffered greatly, more notably among medical students. Medical students could inadvertently develop feelings of anxiety and loneliness, which could compromise their overall well-being and even possibly jeopardize their ability to be at their peak performance, especially in the online learning environment.

This epidemiological investigation aimed to shed light on the situation of medical students enrolled in an online curriculum at a private tertiary medical institution during the COVID-19 pandemic. The recognition of the prevalence of burnout among medical students enrolled in an online curriculum during the COVID-19 pandemic could influence administrative decision-making, academic restructuring, and more optimal learning practices for future healthcare professionals during and beyond the pandemic. The results of this study could allow for early intervention and provision of services to students experiencing burnout, which might relieve obstacles to the achievement of success in online learning. A systems-based approach might be employed by the administrative office of tertiary medical institutions to effectively address and mitigate the development of burnout among its students currently enrolled in online curricula during the COVID-19 pandemic. Thus, the study aimed to identify a possible causal relationship between social connectedness and burnout among medical students of a private tertiary medical institution enrolled in an online curriculum during the COVID-19 pandemic. More specifically, the study described the socio-demographic profile of respondents of a private tertiary medical institution enrolled in an online curriculum during the COVID-19 pandemic, to determine the proportion of the study respondents with reduced perceived social connectedness, and to determine the proportion of the study respondents with symptoms of burnout.

Methods

An analytical cross-sectional study was conducted to determine the relationship of perceived social connectedness and burnout among medical students from a private tertiary hospital in the National Capital Region (Metro Manila). Burnout was measured using a modified Copenhagen Burnout Inventory (CBI), which only consisted of the Personal Burnout and Work-Related Burnout subscales. Both subscales were five-point Likert scales and had 13 items each. A total score of greater than 35 was considered as positive

for burnout or having burnout symptoms. Social connectedness, on the other hand, was assessed using the Social Connectedness Scale - Revised (SCS-R), a six-point Likert scale with 20 items. A score of less than 90 was considered to have decreased / lacking social connectedness. The study utilized convenience sampling and employed an online survey which was disseminated through different social media platforms. Each respondent was asked to fill up a consent form before proceeding with the rest of the questionnaire. The study was approved by the UERMMMCI Research Institute for Health Sciences Ethics Review Committee.

Undergraduate medical students from Year Levels I to III who were residing with their families and/ or relatives in the Philippines and enrolled in an online curriculum for the Academic Year (AY) 2020-2021 were recruited. Individuals with symptoms of hyperthyroidism and/or diagnosed with any mood, depressive, or psychotic disorders were excluded. Using a Z-value for alpha error of 1.96, hypothesized proportion derived from past studies of 0.611, and proportion of the value being studied of 0.75, a sample size of 90 was computed.

Analysis of the basic results was performed with descriptive statistics to elucidate frequencies and percentages based on the CBI and SCS-R scales. Results were interpreted by computing for the prevalence risk ratio (PRR) with a confidence interval of 95% using Chi square as statistical analysis to determine the association between social connectedness and burnout among the respondents. Respondents with burnout and/or reduced social connectedness based on their results after answering the CBI and SCS-R were referred to a psychiatrist for formal evaluation and possible subsequent intervention.

Results

The final number of respondents included in the study was 119. As shown in Table 1, majority belonged to the 23-24 age group (52.9%), female (73.9%) , Roman Catholics (79.8%) and residents of the National Capital Region (58%). All of the respondents were residing with family and relatives. All of the study respondents had at least two electronic gadgets that could be used for online teaching-learning activities; 75.8% owned more than two electronic equipment (i.e., smart phone, computer tablet, and personal computer). In their respective homes, 89.9% of respondents had a designated personal work / study space, while 10.1% of respondents did not have a specific area for online didactics.

Table 1. Social-demographic profiles of survey respondents from a private tertiary institution in Metro Manila as medical students enrolled in the online curriculum for Academic Year 2020-2021.

Variables	N	%
Age Groups (years old)		
21-22	42	31.9
23-24	72	52.9
25-26	15	12.6
27 and above	3	2.5
Sex		
Male	31	26.1
Female	88	73.9
Religion		
Roman Catholic	95	79.8
Others	24	20.2
Address		
National Capital Region	69	58
Other Provinces	50	42
Year Level		
Level I	43	36.1
Level II	56	47.1
Level III	20	16.8
Currently Residing		
With Family / Relatives	115	94
With Friends	3	3
Alone	1	3
Number of Devices Available for Online Teaching-Learning Activities		
1	-	-
2	30	25.2
More than 2	89	74.8
Has Personal Work / Study Space at Home		
Yes	107	89.9
No	12	10.1

As shown in Table 2, there were 86 respondents (72.3%) who had experienced reduced social connectedness during the online learning setup. Respondents were considered to have reduced social connectedness if they attained a score below 90 on the

Social Connectedness Scale. This showed that most of the medical student population had lower social connectedness.

Table 2. Frequency of reduced or normal social connectedness among survey respondents from a private tertiary institution in Metro Manila as medical students enrolled in the online curriculum for Academic Year 2020-2021.

	F (n=119)	%
Reduced Social Connectedness	86	72.3%
Normal / Adequate Social Connectedness	33	27.7%

Table 3 presents the prevalence of burnout among the study respondents, which was found to be 85.7%. This determination was made by considering respondents who scored 35 and above on the Copenhagen Burnout Inventory (CBI) as experiencing burnout. The results indicate that a significant proportion of medical students were affected by burnout during the online learning setup.

Table 3. Frequency of burnout among survey respondents from a private tertiary institution in Metro Manila as medical students enrolled in the online curriculum for Academic Year 2020-2021.

	F (n=119)	%
With burnout	102	85.7%
Without burnout	17	14.3%

In Table 4, the crude prevalence rate ratio (PRR) for having symptoms suggestive of burnout possibly caused by reduced social connectedness was computed to be 1.25 (95%; CI: 1.00, 1.55). This suggested that among medical students with reduced social connectedness, there was higher risk of having burnout, and this was statistically significant.

Discussion

Since the COVID-19 pandemic began and with the implementation of lockdown and community quarantine protocols in the Philippines, psychological stress had been evident among many Filipinos, including young adult medical students, which impacted on their ability to cope with the rigors of a pure online medical curriculum. Medical schools were forced to abruptly shift from the conventional face-to-face learning towards the current online learning which resulted in students expressing feelings of anxiety, burnout, loneliness, homesickness, grief, and hopelessness.[2] Medical students were at risk of burnout due to loss of social support, which could inadvertently affect the affective, cognitive, social, and psychomotor domains of learning. Social connectedness was the most important protective factor of burnout that should be addressed especially in the healthcare setting.[10] Consequently, this underscores the significance of gaining insight into the status and correlation between burnout symptoms and social connectedness among medical students enrolled in an online curriculum at a tertiary medical institution.

In this epidemiologic investigation, more than four-fifths (85.7%) of the student population had burnout symptoms and more than two-thirds (72.3%) experienced reduced social connectedness. Almost two-thirds of the respondents described themselves as having burnout symptoms with reduced social connectedness. The PRR was calculated with a value of 1.25, indicating a positive association between the reduction of social connectedness and prevalence of burnout symptoms in this study. This suggested that an increased frequency of reduced social connectedness could also be related to higher risk for burnout symptoms.

Table 4. Relationship between social connectedness and burnout among survey respondents from a private tertiary institution in Metro Manila as medical students enrolled in the online curriculum for Academic Year 2020-2021.

	(+) Burnout	(-) Burnout	Prevalence Rate Ratio (C.I.)
With Reduced Social Connectedness	78 (65.5%)	8 (6.7%)	1.247 (95% CI 1.001, 1.553)
Without Reduced Social Connectedness	24 (20.2%)	9 (7.6%)	

The COVID-19 pandemic together with the changes in social distancing and online learning had been associated with a decrease in levels of social connectedness globally.[11] This was consistent with current findings of a 72.3% frequency proportion of individuals having reduced social connectedness. Some studies pointed to the pivotal role of modern technology in facilitating virtual interactions within the community.[11-13] However, a qualitative study highlighted the importance of interaction within a physical space and the limitations set by online learning.[11] The study further assessed the primary drawback of online learning to be reduced levels of social connectedness. In addition, unstable and unreliable internet services and episodic power interruptions throughout the Philippines should also be taken into account when assessing the limitations of online interactions, in the setting of a purely online medical curriculum.[11]

In a previous systematic literature review and meta-analysis on burnout among medical students, burnout prevalence ranged from 7.0% to 75.2% using varying country-specific factors, applied instruments, and cut-off criteria for burnout symptomatology, yet none were as high as the observed 85.7% frequency proportion in this present study.[14] Further, current data appeared inconsistent with similar studies on the relationship of burnout and online learning that showed a drop in burnout symptoms.[15,16] The increased prevalence of burnout, as well as online learning, had been independently associated with decreased academic performance in medical students.[17]

This study found a PRR (Prevalence Rate Ratio) of 1.25, indicating that an increase in the frequency of reduced social connectedness was associated with a higher risk of burnout symptoms. These results were comparable with previous research regarding adequate social connectedness as a protective factor in reducing the prevalence of burnout.[18-20] However, there were also studies which concluded that there was no association between social support and prevalence of burnout.[21,22] These conflicting statements might be attributed to the disparity in inventories for burnout and social connectedness used, as well as differences in analyzing the data.

Social support was frequently shown to have a buffering effect against stress.[19,23] This allowed greater resiliency of students amid a myriad of psychosocial stressors. The same set of studies hinted that support from the school or teachers would yield the strongest relationship with student burnout, compared to other forms of social support, such as support from friends or family.[19,23] This also emphasized that school or teacher support contributed the greatest in building resilience of their students due to the direct and practical applications of their help.[19,23] This implied that the different types of social support had varying strengths in the well-being of students. In one meta-analysis, it was reported that students who experienced reduced academic achievement perceived inadequate social support.[19] Another study argued that social support regulated the stress and allowed positive coping against the stress.[24] These studies would therefore conclude that intervention programs against burnt out students would first require assessment of the student's feeling of inefficacy and the perceived amount of social support they received from the school, teachers, and their friends and family.[19]

Conclusion

Amid the COVID-19 pandemic and the implementation of a purely online curriculum, medical students with reduced social connectedness had an increased risk of experiencing symptoms of burnout, PRR of 1.25 (95% CI 1.00, 1.55), and this measure of association was statistically significant.

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A cross-sectional study of the association of social media use during the pandemic to the psychological well-being status of medical students in a private tertiary institution

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Abstract

Introduction Lockdowns and quarantine measures during the pandemic have led to increased media consumption among students worldwide. This study aimed to determine the association between the status of the psychological well-being of medical students in a private tertiary institution and social media use during the pandemic.

Methods This is cross-sectional analytical study which included medical students in a private tertiary institution. SONTUS was used to measure social media usage, while Ryff's Scales of Psychological Well-Being was used to assess the psychological well-being. PRR and Chi-square test were used for data analysis.

Results There were 317 respondents in the study. Based on the results of SONTUS, there are 114 respondents who have high usage. For the Ryff's scale, there were 76 respondents who have low well-being scores. The computed Pearson Chi-square has an associated probability (p-value) of 0.855 which is more than the set significance level of 0.05. For the PRR, the computed value was 1.04.

Conclusion There was no association found between the psychological well-being status of medical students in a private tertiary institution and social media use during the pandemic.

Key words: social media use, well-being, pandemic

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Humanity has used the internet for a wide range of purposes since its inception. It has been used as a tool to help individual with various needs in their daily lives. The popularity of social media sites is clear, as it has permeated our daily lives to the point where it is now pre-installed in mobile phones.[1] The COVID-19 pandemic has disrupted many people's lives and brought the world to a halt. This has resulted in an increase in media consumption among students worldwide.[2] Problematic use of social media can be an indicator of low well-being as it can lead to psychological distress and maladaptive coping mechanisms.[3,4] During the COVID-19 pandemic,

students learned online using video conferencing apps such as Zoom, Google Meet, and others. As a source of entertainment and a way to connect with others, social media usage has skyrocketed during the pandemic. Thus, this raises the question of whether there is a link between social media usage and student's well-being .

The extended lockdown period has led to worsening psychological and learning behaviors of medical students.[5] Some studies reported a slightly lower average quality of life due to the lockdown and increased perception of stress notably due to changes brought by the pandemic, leading to worsening health habits and a sedentary lifestyle.[6] During the start of the pandemic, the need for mandatory lockdown and self-isolation has changed people's way of socializing, including, the increase in the use of social media.[7] Other studies have suggested that time spent on social media increased symptoms of anxiety and depressed mood.[8] Frequent social media use was also determined to be a risk factor for loneliness and low well-being qualities among adolescents which subsequently reduces school performance.[3] Currently, the increasing awareness of mental health in the community has prompted investigations into the factors influencing individual well-being. It is pertinent to examine the relationship between social media use and well-being, particularly in the context of the ongoing pandemic experience. It has been a considerable duration since the lockdown began, and its impact has been felt by everyone involved.

This study examined the potential impact of social media on the psychological well-being of medical students during the pandemic. By providing data on these issues among students, effective policy implementation can be achieved to alleviate their challenges, leading to a more supportive online learning environment for all stakeholders. Specifically, this research aimed to assess the association between social media use during the pandemic and the psychological well-being of medical students at a private tertiary institution.

The study evaluated the psychological well-being status of medical students using Ryff's Scales of Psychological Well-Being, considering dimensions such as autonomy, positive relations with others, personal growth, self-acceptance, environmental mastery, and purpose in life. Additionally, the prevalence risk ratio of well-being status was calculated and analyzed concerning the use of social media, including variables such as frequency and duration of use, alongside the scores on Ryff's Scales of Psychological Well-Being for first to fourth year medical students.

Methods

This study utilized a cross-sectional analytical research design to assess the strength of the association between social media use and the low psychological well-being of the first year to fourth year medical students in a private tertiary institution who were currently enrolled in the Academic Year 2022-2023. This study was approved by the UERMMMCI Research Institute for Health Sciences Ethics Review Committee.

The data were collected using Google Forms and distributed to the selected participants through a randomization process based on their class numbers. The study utilized two questionnaires which are Ryff's Scales of Psychological Well-Being and the Social Networking Time Use Scale (SONTUS).

The Ryff's Scales of Psychological Well-Being, an 18-item questionnaire, was used to measure the state of psychological well-being of medical students.[9] The composite scores were calculated from the six individual scales of Ryff's scales. The answers in the test were summed up and compiled to get the percentiles. Individuals in the 25th percentile were categorized as having low well-being, while those in the 50th and 75th percentile were grouped together and interpreted as having a high well-being score. The Social Networking Time Use Scale (SONTUS), a 29-item questionnaire, was divided into five factors: relaxation and free periods, academic-related periods, public-places-related, stress-related periods, and motives for use.[10] In this study, the global SONTUS scores were interpreted as follows:

- Low user of social media is defined as the results with a SONTUS score of 5 to 9. A score of 10 to 14 indicates an average user of social media. A high user of social media is defined as results with a SONTUS score of 15 and 19. A SONTUS score of more than 19 indicates an extremely high user of social media.
- The term low usage of social media in this study refers to actual low and average SONTUS scores grouped.
- The term high usage of social media as used in this study refers to the actual SONTUS

scores with high use and extremely high use classified together.

A Chi-square test was performed to assess the association between social media use and psychological well-being. Additionally, to further quantify the relationship between the variables, the prevalence risk ratio was calculated.

Results

This study comprised a total of 317 respondents. The average age of the participants was 23 years old, and the majority were female (68.77%; n=218). Among the 317 respondents, 98 (31%) were freshmen, 81 (26%) were sophomores, 83 (26%) were juniors, and 55 (17%) were seniors (Table 1). Stratified random sampling was employed to achieve the necessary minimum number of respondents for each year level. Specifically, 94 students were required for year level one, 46 students for year level two, 79 students for year level three, and 82 students for year level four (Table 2).

However, among the 82 fourth-year students required, only 55 responses were obtained, while 27 students did not respond. This results in a non-response rate of 8.97%.

Table 1. Demographics of the study respondents (n=317).

Characteristics	n (317)	%
Gender		
Male	942	9.65%
Female	218	68.77%
Prefer not to say	5	0.016%
Year Level in College of Medicine		
1st year level	98	31%
2nd year level	81	26%
3rd year level	83	26%
4th year level	55	17%

Table 2. Breakdown of needed respondents per year level.

Year Level	Total No. of Students	Number of Students Needed
I	424	94
II	209	46
III	359	79
IV	374	82

Social Networking Time Use Scale (SONTUS)

Facebook emerged as the most utilized social media platform among the respondents, with 309 (97.47%) participants using it. The usage of other platforms was as follows: Instagram (89.59%), Twitter (65.3%), Pinterest (32.17%), WhatsApp (4.73%), Myspace (0.31%), and other unspecified social media platforms (8.20%) (Table 3).

Table 3. Social media platforms used by medical students.

Social Media Platforms	Respondents	%
Facebook	309	97.47%
Instagram	284	89.59%
Twitter	207	65.30%
Pinterest	102	32.17%
WhatsApp	15	4.73%
Myspace	1	0.31%
Other	26	8.20%

Additionally, the study measured the preferred social media platforms among the respondents. Facebook was the most preferred platform, chosen by 47.6% of the participants, followed by Instagram (31.2%), Twitter (12.3%), other social media platforms (8.2%), and lastly, Pinterest (0.6%) (Table 4).

Table 4. Most used social media platforms used by medical students.

		Frequency Percent	Valid Percent	Cumulative Percent
Facebook	151	47.6	47.6	47.6
Instagram	99	31.2	31.2	78.9
Twitter	39	12.3	12.3	91.2
Other	26	8.2	8.2	99.4
Pinterest	2	0.6	0.6	100.0
Total	317	100.0	100.0	

The distribution of medical students based on the time spent on social media per year level is depicted in Figure 1. Among the first-year respondents, 63 were categorized as average users of social media, while 35 were classified as high users of social media. For second-year respondents, 55 were considered average

users, and 26 were considered high users. In the third-year group, 54 were identified as average users, and 29 were classified as high users. Lastly, among fourth-year respondents, 31 were categorized as average users, and 24 were classified as high users of social media. In the research, a total of 203 respondents were identified as having low usage of social media based on their SONTUS global score. This indicates that they use social media less frequently and for shorter durations. On the other hand, 114 respondents were classified as having high usage of social media based on their SONTUS global score (Figure 2). This suggests that they use social media more frequently and for longer durations.

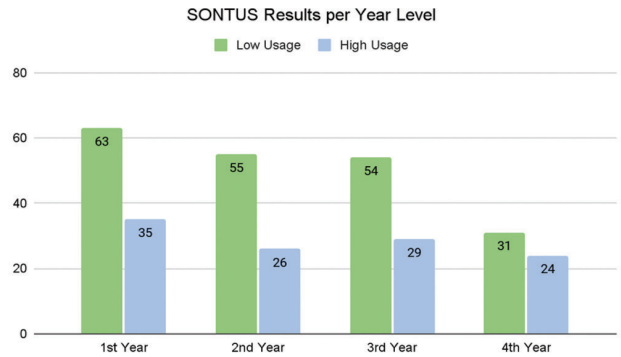

Figure 1. Distribution of medical students based on the time spent using social media per year level (SONTUS).

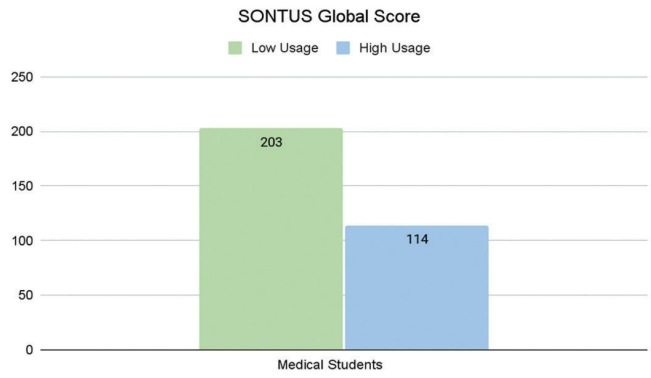

Figure 2. Distribution of the total number of medical students based on the time spent using social media.

Ryff's Scale of Psychological Well-being

The average raw scores of the respondents in the different domains were as follows: For autonomy, students scored 4.19, for environmental history, the average score was 3.82, for personal growth, the mean score was 5.16, for positive relations with others, the score was 3.67, for purpose in life, the score was 4.17, and finally, for self-acceptance, the mean score was 4.33. Remarkably, the domain of personal growth obtained the highest average raw score, implying that respondents may experience a sense of ongoing development and self-improvement (Figure 3).

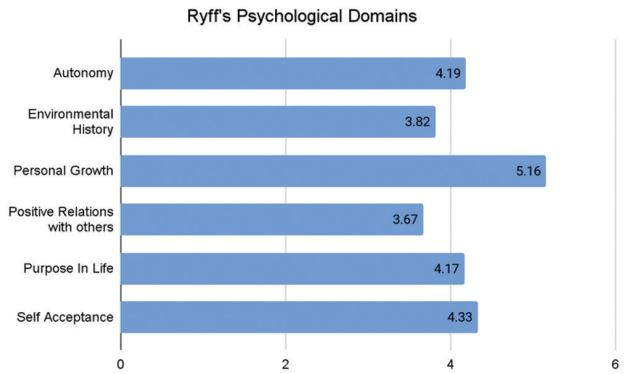

Figure 3. Mean scores of Ryff's Scale of Psychological Well-being per domain.

To provide a comprehensive understanding of the respondents' well-being scores, the well-being scores of different year levels were depicted in Figure 4. Among the freshmen, 74 were shown to have high well-being, while 24 were considered to have low well-being. For sophomores, 64 respondents demonstrated high well-being, while 17 were categorized as having low well-being. Among juniors, 60 exhibited high well-being, while 23 were identified as having low well-being. Lastly, there were 43 senior students with high well-being and 12 with low well-being scores.

The average global score of all respondents was 76, with a median score of 76 as well. The fact that the mean and median are the same suggests an even distribution, as indicated by the histogram (Figure 5).

The compiled global scores of the respondents revealed that the 25th percentile was 70, the 50th percentile was 76, and the 75th percentile was 83 (Table 5). With the 25th percentile set at 70, global scores lower than 70 were classified as low well-being, while scores greater than or equal to 70 were considered indicative of high well-being.

In this study, 241 respondents were categorized as having high well-being, as their global scores were equal to or above 70. Conversely, there were 76 respondents with global scores below 70, indicating that they were classified as individuals with low well-being.

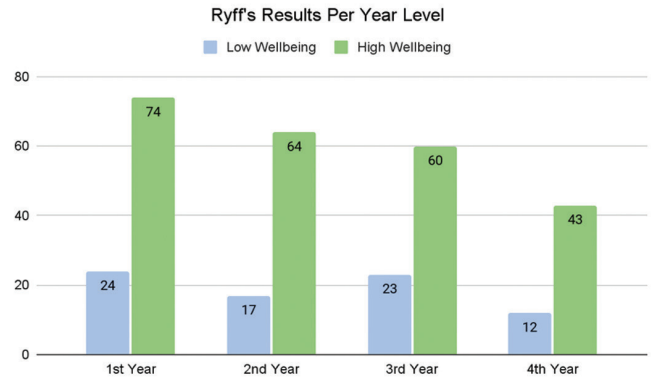

Figure 4. Mean scores of Ryff's Scale of Psychological Well-being per year level.

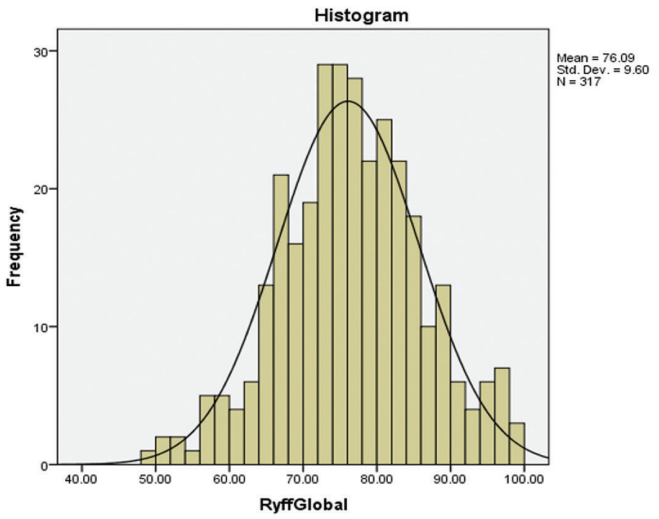

Figure 5. Distribution of respondents according to their global scores.

Table 5. Global score computation of Ryff's Psychological Well-being Scale.

Mean	Median	Std. Deviation	Percentiles	
			25	70.0
76.0883	76.0883	76.0883	50	76.0
			75	83.0

Chi-Square Test and Prevalence Risk Ratio

In the context of the prevalence risk ratio, the calculated value was 1.04 (Table 6). Given that the PRR value is proximate to 1.0, it can be inferred that there is no significant association between the development of low psychological well-being and high social media exposure.

Furthermore, among the respondents who are high users of social media, 24.5% of respondents have low well-being while 75.44% have high well-being. For the low users of social media, 76.35% have high well-being.

Discussion and Conclusion

With the increasingly prominent role of social media in the lives of medical students during the pandemic, understanding the effects of social media on their psychological well-being is crucial.[11] In this study, there was no association found between the psychological well-being status of medical students and social media use during the pandemic. This was contradictory to the results gathered by a study that students with higher social media addiction scores had a greater risk of experiencing mild depression.[12] The slight increase in the prevalence risk ratio may be indicative of the possible risk of low psychological well-being with high exposure to social media – suggesting that the relationship between the two variables cannot be completely dismissed.

In addition, twenty-eight medical students who have high social media use were found to have low-

Table 6. Distribution of respondents with low and high well-being scores based on their social media use.

Social Media Use	Low Well-being		High Well-being		Total
	No.	%	No.	%	
High User	28	24.56%	86	75.44%	114
Low User	48	23.65%	155	76.35%	203

being scores. Previous studies have provided evidence that high social media use may be harmful to mental health.[5,6] For instance, a recent study in Wuhan suggests that frequent social media exposure has been positively associated with a high prevalence of mental health problems.[13] Another study further corroborates this finding stating that university students in Indonesia tend to have a greater risk of experiencing mild depression.[12]

Social media use can also be a source of stress. Stressful content can easily have a negative effect on the social media user as observed during the start of the pandemic when uncertainties about the future are reported and an increase in fake news, and hoaxes also present.[3,12] Seeing this information can have possibly taken a toll on the psychological well-being of medical students.

Another common feature of social media is social envy and bitterness.[12] Social envy has also been observed in research which suggests that Facebook use has led to a decrease in subjective well-being as exhibited by respondents who negatively compare themselves to their Facebook friends. Concurrent to the findings in this study, seventy-two medical students, who have chosen Facebook as their most used application and who have low to high social media use, have also exhibited low well-being scores (Table 2).

While excessive or problematic use of social media has been associated with a negative impact on psychological well-being, studies have also shown evidence of social media use as a coping mechanism and a source of social support.[3] In a similar study done on students in Mexico, they determined that social media use is a significant influencing factor in bonding social capital.[14] This implies that, during a pandemic, social media enables students to continue their close relationships with family members, friends, and those with whom they have close ties.

In a similar experimental research, respondents who were allowed to use Facebook after being presented with a stressful situation reported lower levels of psychosocial and physical stress.[11] Similarly, university students use Facebook as a self-disclosure tool in stressful situations as well as a source of social support.[15] Consistent with these findings, 86 medical students in this study were high users of social media and have high well-being scores suggesting the use as a coping mechanism and possible stress-buffer effect from online social support.

The limitations of this study should also be acknowledged. First, the survey, although convenient, was not personally supervised by the researchers to address the respondents' minor technical problems or questions. Hence, respondents may become weary when answering the survey questions which may affect the quality of their responses.[16] Second, some respondent bias might also arise. Inaccurate reporting of social media use such as users reporting lower amounts of activity as excessive is seen as largely undesirable.[14] Third, survey satisficing where respondents select the first reasonably acceptable option and do not take time to fully consider the entire set of options that may have been present.[17] SONTUS' questionnaire has an 11-point Likert scale requiring more time to consider and recall the other options. Fourth, the timing at which the questionnaire was administered and answered could have resulted in respondents' inattention. Respondents who are busy or who have been under academic stress (e.g., upcoming examinations) could have easily chosen the most acceptable option for faster completion of the survey. Lastly, this study did not perform verification on the prevalence of existing psychological conditions in the randomized sample to assess their current well-being. This might have possibly intervened with the dependent variable. The confounding variables of this study include clinically diagnosed depression and/or anxiety, personality, and temperament. However, restrictions in the design phase (e.g., exclusion criteria) were not implemented. Psychological assessment was not feasible due to the researchers' limited expertise, and so as not to promote bias against those with undiagnosed and diagnosed mental illnesses that were stable.

In conclusion, the study showed that there is a low risk of producing negative effects on the psychological well-being of medical students through high usage of social media; however, it is important to note that no significant relationship between social media use and overall well-being was found in the study.

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A descriptive cross-sectional study on the motivation of work-from-home office workers in the National Capital Region

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Abstract

Introduction The landscape of work has changed since the start of the COVID-19 pandemic as more companies shifted from face-to-face to the work-from-home (WFH) setup. This change has affected several aspects of human life especially the motivation to WFH. The study aimed to determine the motivation of WFH among office workers in the National Capital Region (NCR) from March 2020 to February 2022.
Methods Using a descriptive cross-sectional study design, an online survey of WFH office workers around the NCR, Philippines was conducted. A 26-item questionnaire on motivation covering dimensions of availability (flexibility), safety (work-life balance), and meaningfulness (work performance) was used. Data was analyzed using SPSS version 24.
Results A total of 252 respondents were included in the study, with a majority identifying as females aged 21 to 30, never married, and college graduates. Additionally, respondents reported having one to five years of work experience and were employed in professional/technical/managerial fields. Regarding the impact of remote work, the findings indicated that most individuals who worked from home (WFH) felt motivated by this setup due to its positive effects on availability, time and cost savings from reduced commuting, and the flexibility it provided for managing their schedules according to personal preferences. Furthermore, in terms of safety and conducive work environment, WFH office workers expressed agreement that the remote work setup contributed to a favorable work environment, leading to increased job satisfaction. This setup allowed them to effectively balance work responsibilities with personal and family commitments. The study also revealed that WFH office workers perceived a sense of meaningfulness in their work, as they felt trusted and valued by their employers. This sentiment contributed to their overall well-being, both physically and mentally
Conclusion Work-from-home office workers are generally always motivated in terms of availability (flexibility), safety (work-life balance) and meaningfulness (work performance).

Key words: work-from-home, motivation, office workers, flexibility, work-life-balance, and work performance

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The COVID-19 pandemic has continued to exert pressure on businesses and the economy. Public and private institutions have been forced to adapt to WFH arrangements to safeguard the health of their employees, reduce virus transmission while continuing to provide services and goods to the public. Teleworking, telecommuting, or better known as WFH, "is a flexible work arrangement that affords employees the ability to periodically, regularly, or exclusively perform work for their employers from home or another remote location that is equipped with the appropriate computer-based technology to

transfer work to the central organization."[1] Due to the uncertainty on when the COVID-19 pandemic will end, WFH has become the new normal.[2]

Prior to the pandemic, WFH was not widely practiced on a full-time scale.2It was often associated with positive impacts such as reduced transportation costs and flexible working hours, but recent studies showed that people under the WFH setup during the pandemic had more negative than positive experiences. A study revealed that the shift to remote work (WFH) during the pandemic resulted in heightened work-life conflict. Workers reported increased challenges in managing both work-related and family-related issues, leading to strained relationships that ultimately affected their job performance.[1] The situation was exacerbated by extended working hours, which were often attributed to issues such as unreliable internet connectivity, subsequently leading to reduced efficiency and potential role overload.[1]

As a consequence of these mounting negative effects and work-related stressors within the WFH framework, workers experienced a decline in efficiency and productivity, consequently leading to decreased motivation and lowered morale. This finding resonates with the observations made by a study which underscored the importance of worker engagement as a catalyst for motivation in their work.[1] They proposed that engagement emanates from three core factors: availability (flexibility), safety (work-life balance), and the sense of meaningfulness (work performance).[1]

The general objective of this study was to determine the motivation of work from home among office workers in the NCR from March 2020 to February 2022 by using Perception of Work-From-Home Survey in terms of availability (flexibility), safety (work-life balance), and meaningfulness (work performance).[1] The cross-sectional data obtained could propel the framework for contextualizing work motivation among WFH office workers in the Philippine setting.

Methods

This research utilized a descriptive cross-sectional design to determine the work motivation of office workers on three dimensions: availability (flexibility), safety (work-life balance), and meaningfulness (work performance).

An online survey employing convenience sampling was conducted, involving 252 individuals engaged in remote work (WFH) within the National Capital Region (NCR). The survey was distributed through Facebook and the Facebook Messenger app. Data collection spanned from August 23 to October 19, 2022, encompassing a total duration of 57 days. The survey tool remained accessible to respondents at all times, allowing them to participate at their convenience. On average, each participant took around 30 minutes to complete the survey.

The survey targeted WFH office workers residing and working in the National Capital Region (NCR). Eligible participants fell within the age range of 21 to 60, and they were required to be both residents and office workers in the NCR. Inclusion criteria encompassed individuals whose employers transitioned to a WFH arrangement at the onset of lockdown measures, spanning from March 2020 to February 2022. Notably, individuals engaged in hybrid work setups and those with less than six months of WFH experience were excluded from the study. Work motivation is defined as the feeling of work engagement of employees wherein engagement stems from availability (flexibility), safety (work-life balance), and the feeling of meaningfulness (work performance).[2] Availability (flexibility) is defined as the employee's feeling of being physically and mentally able to harness his/her maximum potential at the job.[2,3,4] It is the total score derived from a 9-item 5-point Likert scale with higher scores indicating a highly flexible individual. Safety (work-life balance) is the employee's feeling of being comfortable to show his/her real self at the job without being reprimanded and without facing negative consequences.[2,3,4] It is the total score derived from a 10 item 5-point Likert scale with higher scores indicating a good work-life balance. Meaningfulness (work performance) is how an employee finds his/her work meaningful for the company.[2,3,4] It is the total score derived from a 7 item 5-point Likert scale with higher scores indicating how meaningful the employee finds his/her work.

The survey tool adopted was Zamani, et al.'s Perception of Work-From-Home Survey on Motivation of Office Workers on three dimensions: availability (flexibility), safety (work-life balance) and meaningfulness (work productivity) with 10 items for each dimension.[2] Content validity was conducted by a panel of 10 experts consisting of a psychometrician, anthropologist, sociologist, human resource manager, industrial/labor relations

expert, statistician, psychiatrist, clinical psychologist, abnormal psychology professor, and an occupational health practitioner. Items with a CVI of 0.59 were accepted, 0.5 were revised, and <0.5 were rejected.[5] One item from the availability domain (CVI = 0.3) and three items from the meaningfulness domain (CVI = 0.1, 0.2, and 0.4) were omitted from the tool. Two items in the meaningful domain with CVI = 0.5 were revised as these were not applicable in the Philippine setting. Items for revision were amended by the psychometrician.

The final number of items in the content validated tool was 26 with 9 items for availability, 10 items for safety and 7 items for meaningfulness. A pre-testing phase was carried out involving 30 participants, following the methodology outlined in a previous study by Perneger, et al.[6] The internal consistency was calculated, resulting in a Cronbach's Alpha coefficient of 0.934. Codes were assigned to the variables in the socio-demographic profile as well as answers for each domain. The three domains of the study have a Likert scoring of 1 for "Never", 2 for "Rarely", 3 for "Sometimes", 4 for "Very Often'' and 5 for "Always."

SPSS version 24 was used for the analysis of the encoded responses. Descriptive statistics used were mean with standard deviation for quantitative variables and counts with proportions for qualitative variables. The proportion of the predominant Likert scale response for each item was obtained. The distribution of the dimensions of motivation according to demographic and work-related variables was presented in tables.

The study was approved by the UERM Ethics Review Committee with ERC Code 1260/C/2022/070.

Results

Of the 252 respondents in the study, majority were female (63.1%), aged 21-30 (75.8%), never married (77.8%), and college graduates (93.7%) (Table 1).

Most of the respondents have worked for 1 to 5 years (65.5%) and hold professional, technical, or managerial positions (73.8%) (Table 2).

Table 3 shows most of the office workers preferred working from home due to less worries about the time and money spent on commuting. The more comfortable work environment also enabled them to work anytime and manage their own schedules with less stress. However, majority of respondents said it was only "sometimes" that it took them less time to complete their WFH tasks.

Table 1. Socio-demographic profile of work from home office workers.

Socio-Demographic Profile	Category	Frequency (%)
Sex	Male	93 (36.9)
	Female	159 (63.1)
Age Group (in years)	21-30	191 (75.8)
	31-40	41 (16.3)
	41-60	20 (7.9)
Marital Status	Never Married	196 (77.8)
	Married	34 (13.5)
	Living Together	18 (7.1)
	Divorced/Separated	2 (0.8)
	Widowed	2 (0.8)
Educational Attainment	Junior High School	3 (1.2)
	Senior High School	3 (1.2)
	College[A]	236 (93.7)
	Postgraduate[B]	10 (4.0)

[A] Bachelor's degree holders
[B] Masters or Doctorate degree holders

Table 2. Work profile of work from home office workers.

Work Profile	Category	Frequency (%)
Work Experience	1-5 years	165 (65.5)
	6-10 years	48 (19.0)
	>10 years	39 (15.5)
Occupation	Professional/Technical/Managerial	186 (73.8)
	Clerical	16 (6.3)
	Sales and Services	50 (19.8)

Table 4 shows majority of office workers found the WFH setup a more conducive working environment. It provided job satisfaction because they could attend to their needs, as well as their family's needs while at work. They also had less worries regarding work hours since they no longer had to go through traffic, which could take time off their tasks.

Table 5 shows most of the respondents had a good relationship with their employer because their superior understood their challenges. Respondents said their employer was concerned about their mental and physical well-being and trusted them even while they worked by remote. A significant number also felt that the WFH setup affected their career.

Table 3. Dimension of availability (flexibility) on motivation of work-from-home office workers.

Item	Most predominant response in the scale	Interpretation	Frequency (%)
I take less time to complete my task when I work from home	3	Sometimes	80 (31.7)
I cherish not having to spend time commuting to work on daily basis	5	Always	201 (79.8)
I am able to save on commuting expenses while working from home	5	Always	213 (84.5)
I can immediately get to work upon waking up every day while working from home	5	Always	173 (68.7)
I am comfortable to do my work anytime	5	Always	131 (52.0)
I can focus my work by managing my own schedule	5	Always	130 (51.6)
I am able to enjoy a healthier lifestyle	5	Always	97 (38.0)
I face less stress doing some work tasks at home	5	Always	89 (35.3)
My work productivity increases with less stress while working from home	4	Very Often	94 (34.6)

Table 4. Dimension of safety (work-life balance) on motivation of work-from-home office workers.

Item	Most predominant response in the scale	Interpretation	Frequency (%)
I can manage my work responsibilities alongside my personal and family needs	4	Very Often	108 (42.9)
I cherish not having to spend time commuting to work on daily basis	5	Always	148 (58.7)
The flexibility offered to my current job is ideal for me.	5	Always	159 (63.1)
I find having an office space at home helped improve my job satisfaction	5	Always	122 (48.4)
I find working from home beneficial for me as I am able to simultaneously attend to my family needs	5	Always	133 (52.8)
I found working from home more conducive than working in a normal office condition	5	Always	92 (36.5)
I no longer have to face traffic jams to and from work every day	5	Always	221 (87.7)
I no longer have to travel to work, therefore I am able to spend more time on the task at hand	5	Always	181 (71.8)
I feel healthy and have a better well-being when working from home	5	Always	98 (38.9)
I am able to take care of myself and others better while working from home	5	Always	121 (48.0)

Table 5. Dimension of meaningfulness (work productivity) on motivation of work-from-home office workers.

Item	Most predominant response in the scale	Interpretation	Frequency (%)
I feel my superior understands my challenges while working from home	5	Always	103 (40.9)
My employer has high trust in employees working from home	5	Always	149 (59.1)
I feel that working from home does not impact my career progression	1	Never	95 (37.7)
My employer provides work supplies for employees working from home	5	Always	104 (41.3)
I have a conducive area to do my work at home	5	Always	126 (50.0)
My employer is concerned about employees' mental and physical health when they work from home	5	Always	107 (42.5)
My employer educates employee on cybersecurity threats and the importance of data protection	5	Always	147 (58.3)

This study also looked into several items in the scale which had significant differences in responses across groups. Differences in motivation by age group, gender, marital status and years of work experience were compared. Table 6 shows that 31.4% (60 out of 191) of respondents aged 21-30 "very often" took less time to complete their tasks when working from home compared with the 26.8% (11 out of 41) among those in the 31-40 years group and 25% (5 out of 20) among those aged 41-60.

Table 7 shows that 29.3% (22 out of 75) of males who never married "very often" took less time to complete their tasks when working from home compared with the 36.4% (44 out of 121) of females who never married.

As seen in Table 8, 40% (2 out of 8) of married males compared with 38.7% (29 out of 75) of never married males said they "always" faced less stress while working at home. Conversely, 34.7% (42 out of 121) of never married females compared with 23.1% (6 out of 26) of married females "very often" faced less stress while working at home.

Table 9 shows that 41.8% (69 out of 165) of the respondents who have worked for one to five years "always" managed their work responsibilities alongside their personal and family needs compared with 35.4% (17 out of 48) of the respondents who have worked for six to 10 years, and 35.9% (14 out of 39) of the respondents who have worked for more than 10 years.

Discussion

Majority of the respondents showed high motivation and answered "always" to most items across the dimensions of availability (flexibility), safety (work life balance) and meaningfulness (work performance). Results concerning the availability (flexibility) dimension mirrored prior research.[2] The leading responses in this current study were as follows: 84.5% of participants consistently indicated "always able to save on commuting expenses while working from home"; 79.8% reported "always cherishing not having to spend time commuting"; and 68.7% responded "always immediately able to start work upon waking up." These outcomes emphasized the substantial motivational impact of cost and time savings associated with commuting and preparation for work among WFH proponents.[2]

A research study focusing on private and government employees within the NCR and CALABARZON regions (comprising Cavite,

Table 6. Comparison by age groups on the item "I take less time to complete my task when I work from home".

Item: I take less time to complete my task when I work from home				
Response to Item	Age Group			Total
	21-30	31-40	41-60	
Never	13	1	0	14
Rarely	25	3	4	32
Sometimes	56	17	7	80
Very Often	60	11	5	76
Always	37	9	4	50
Total	191	41	20	252

Table 7. Comparison between never married males and females on the item "I take less time to complete my task when I work from home".

Item: I take less time to complete my task when I work from home				
Marital Status	Response to Question	Sex		Total
		Male	Female	
Never Married	Never	5	8	13
	Rarely	11	13	24
	Sometimes	23	35	58
	Very Often	22	44	66
	Always	14	21	35
Total		75	121	196

Table 8. Comparison between never married and married males and females on the item "I face less stress doing some work tasks at home".

Item: I face less stress doing some work tasks at home				
Marital Status	Response to Question	Sex		Total
		Male	Female	
Never Married	Never	1	4	5
	Rarely	6	14	20
	Sometimes	19	26	45
	Very Often	20	42	62
	Always	29	35	64
Total		75	121	196
Married	Never	0	0	0
	Rarely	1	1	2
	Sometimes	3	8	11
	Very Often	2	6	8
	Always	2	11	13
Total		8	26	34

Table 9. Comparison by work experience on the item "I can manage my work responsibilities alongside my personal and family needs".

Item: I can manage my work responsibilities alongside my personal and family needs				
Response to Question	Work Experience			
	1-5 years	6-10 years	>10 years	Total
Never	0	0	0	0
Rarely	4	0	2	6
Sometimes	29	5	4	38
Very Often	63	26	19	108
Always	69	17	14	100
Total	165	48	39	252

Laguna, Batangas, Rizal, and Quezon) investigated the benefits of the WFH arrangement.[7] Notably, 33.33% of participants from both sectors highlighted reduced expenses as a key advantage of the WFH setup. Furthermore, the study revealed that employees experienced lower stress levels due to the absence of commuting-related traffic when working remotely.[7]

In this study, the aspect of flexibility with the lowest rating of 31.7% was "taking less time to complete tasks in a WFH setup," marking it as the least significant factor. This observation aligned with the findings reported in previous studies conducted by different researchers.[3,7]

Upon breaking down the predominant response of "I take less time to complete my task when I work from home," differences were noted based on the socio-demographic profiles of respondents. In terms of age, 31.4% of respondents aged 21-30 said they "very often" took less time to accomplish WFH responsibilities compared with the 26.8% aged 31-40, and the 25% aged 41-60. This is similar to the results in another study, where younger workers were found to more likely to adapt in a technology-field environment such as a remote work setup compared with older workers.[8] In terms of gender as well as marital status of respondents, 30.6% of males who never married "sometimes" take less time to accomplish work from home tasks compared with 29.3% of females who never married. This finding is similar to a study conducted in Germany where males were found to have more flexibility at work compared to females.[9]

Gender roles at home are at play, wherein women are expected to do more household chores compared to men, alongside the office work they need to do while at home. However, a study noted that 21% of females preferred to WFH compared with 18% of males. It could mean that females find it beneficial to work from home because they are able to juggle household chores and office work while at home.

In terms of having less stress while doing WFH tasks, 40% of married males versus 39% of never married males "always" faced less stress doing WFH tasks, while 23.1% of married females versus 34.7% of never married females "very often" face less stress doing WFH tasks. A higher proportion of males compared to females who were married while a higher proportion of females compared to males who were not married faced less stress when completing work tasks. Current findings are in line with the findings of a local study where females had more negative effects and lower work productivity from working at home compared to male counterparts.[10] Similar findings were also noted in the study done abroad where women had to balance household chores with their occupation roles as dictated by societal norms.[11] Furthermore, married women faced the most stress among the four categories as traditional gender roles expected women to balance home making with work responsibilities while working at home.

Similar to a study conducted abroad, the findings regarding the dimension of safety (work-life balance) were generally positive; the most predominant response was 'always' for nine out of ten items.[2] The only exception was the item on managing work responsibilities alongside family and personal needs with 42.9% "very often" agreeing with this statement. Two studies done abroad found that working from home is especially difficult for employees with small children and interruptions by family members and home responsibilities can cause mismanagement of work responsibilities.[12,13] This is in contrast to a local study which found that 56% of private and government employees in NCR and CALABARZON said they were efficient when they worked from home, only 22% said they were somewhat productive and 22% said they were not productive at all.[7] The respondents said they were more effective when operating from home because they could combine their office duties with home responsibilities. These findings are similar to the results of a local study.[7]

Based on years of work experience, this study found that 41.8% of respondents with 1 to 5 years of work experience "always" managed work responsibilities alongside personal and family needs compared with 35.4% of those with six to 10 years' work experience and 35.9% of those who worked for more than 10 years. One reason for this might be that people with fewer years of work experience tend to be younger and have fewer personal and family responsibilities. In this current study, individuals with greater years of work experience typically face increased work responsibilities, balancing them with personal and family demands. This contrasts with a study that discovered older employees tend to exhibit higher resilience than younger workers, primarily due to the former's greater access to job resources such as job security and equipment.[14]

In terms of meaningfulness (work performance), all items had a generally favorable response in which respondents predominantly rated the items "always" except an item on working from home not affecting career development of employees. Thirty seven percent did not agree to this statement. The respondents worried about opportunities and room for growth in their career in a WFH setup. There were contrasting opinions on the impact of WFH on one's career development. A WFH setup could have negative effects on one's career as employees develop lack of dedication to their work because of the flexibility offered by this setup. This finding concurs with an earlier study done in the United States.[15] However, the Canadian study found that WFH jobs offer higher salaries compared to face-to-face jobs which could motivate employees to switch to telecommuting.[16]

The similarities in responses of the Malaysian study by Zamani, et al. and this current study are proof that working from home is perceived to be beneficial to the quality of life of people across cultures in terms of saving time and money. However, working from home also poses disadvantages such as its possible negative impact on career development and distractions from family members while working.

Overall, the majority of respondents showed high motivation across the three dimensions: availability (flexibility), safety (work life balance), and meaningfulness (work performance). In terms of availability (flexibility), the majority of respondents preferred working from home because of money saved, decreased time for commuting, and the ease

of managing their own schedule resulting in a more comfortable working environment and less stress in doing the tasks at hand.

On safety (work-life balance), most of the respondents favored the WFH setup because of the conducive working environment, making them satisfied with their job. With the flexibility of time that WFH offers including time off work without loss of pay and less stress from traffic jams, the respondents were able to attend to their own needs and their families, giving them a sense of well-being.

Lastly, in terms of meaningfulness (work productivity), most of the respondents said their superiors trusted them, understood their challenges, and were concerned about their mental and physical health while working from home, thus fostering a good employer-employee relationship. However, a significant number of respondents also felt that working from home could affect their career development.

The study was conducted in an online setting. One challenge in online surveys is the genuineness of the answers provided by respondents. The inclusion criteria limited the potential respondents for this research as respondents were predominantly office workers who had worked for at least six months and were living in NCR. A significant number of potential respondents would have been workers who worked in other areas besides the office, workers who had worked from home for one to three months and workers outside NCR. The study also followed a specific timeline similar to that of the onset of the COVID-19 pandemic and the lockdown that ensued. Because of this, the possibility of expanding the inclusion criteria was unlikely.

This study could serve as a baseline for looking at the motivation of other groups such as non-office-based workers who WFH and for exploring possible differences with such groups. This study can also be a springboard for further studies that correlate motivation with other organizational or industrial concerns such as work productivity, work performance, gender gap in working hours and earnings. Another interesting study would be how the motivation of WFM employees correlate with the number of children an employee has. There might be differences in the motivation of those without children compared with those with children specifically in the dimension of safety (work-life balance).

The findings of this study can also be used to improve the working conditions of employees in a WFH setup. Human resource practitioners and industrial relations specialists could consider the results of the study in their supervision of employees in a WFH setup. This is relevant since a lot of companies have adapted the WFH setup since the pandemic. The findings could also help policymakers pass laws to improve the welfare of employees in a WFH setup. Motivation is an important factor in the occupational health of WFH office workers. While physical health is important to reduce absences and improve work performance, mental health concerns should be prioritized as well.

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

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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.

Tables and figures

These should be submitted as a **separate Word or Excel file (NOT AN IMAGE FILE)**, numbered with Arabic numerals and accompanied by a title and an explanatory caption at the top. Each table must be referred to in the text and an indication of the preferred position in the text should be given. Other explanatory materials should be placed in footnotes below the tables. All non-standard abbreviations should be explained in the footnotes. Vertical and horizontal rules between entries should be omitted. Each figure (graphs, charts, etc.) should be identified clearly and numbered in Arabic numerals and accompanied by a title and an explanatory caption at the bottom.

Photographs

Photographs and illustrations should be submitted as a separate image file in **jpeg format** with a resolution of at least **800 x 600 dpi**. Each photograph or illustration should be identified as a figure and numbered in Arabic numerals and accompanied by a title and an explanatory caption at the bottom. Specific points of interest in the photograph or illustration should be marked with an

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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