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Research Article

A Descriptive-Correlational Study On Lifestyle And Sleep Apnea Among Adults In Doha, Qatar

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Abstract

The study examined the relationship between lifestyle factors and the likelihood of developing obstructive sleep apnea in an adult population in Doha, Qatar (n=60), using a descriptive-correlational design and purposive sampling of participants aged 18–80 years. Pregnant women were excluded. Results revealed a high prevalence of poor sleep quality and very high risk of obstructive sleep apnea among middle-aged male participants, especially within Arab and South Asian populations. A strong negative correlation was found between healthy lifestyle behaviours particularly those related to psychological well-being, safety, social connection, and life purpose and sleep-apnea risk ($r=-0.76$, $p<.001$). These findings underscore the need for a comprehensive prevention and management strategy for obstructive sleep apnea that integrates clinical intervention with lifestyle enhancement (physical activity, nutrition, mental-health support, community engagement). Implications for clinical practice include the adoption of lifestyle screening tools (e.g., the LHQ-B) in sleep clinics, and for public-health policy to target behavioural dimensions of sleep health. Future research should employ intervention-based and longitudinal designs to establish causal links and assess outcomes across broader, more diverse populations.

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1. Introduction

Sleep apnea is a chronic sleep disorder characterized by repeated pauses in breathing during sleep, leading to fragmented rest and intermittent oxygen deprivation. These breathing interruptions, known as apneas, can last from 10 seconds to several minutes and may occur numerous times throughout the night. The three primary types of sleep apnea are obstructive sleep apnea (OSA), central sleep apnea (CSA), and mixed sleep apnea. Among these, OSA is the most common and results from the relaxation of throat muscles that obstruct the airway, whereas CSA occurs when the brain fails to transmit proper signals to the breathing muscles (Ansari et al., 2021). Affecting approximately 6–13% of the global population, OSA manifests through loud snoring, frequent awakenings, and excessive daytime fatigue caused by fragmented sleep (Peppard et al., 2013). While continuous positive airway pressure (CPAP) therapy and surgical treatments can alleviate symptoms, poor compliance and financial barriers highlight the importance of preventive, lifestyle-based management strategies.

Several lifestyle factors are closely associated with the development and exacerbation of OSA. Tobacco and alcohol use are significant risk factors, as smoking causes inflammation and swelling in the upper airway, while alcohol relaxes throat muscles, increasing airway collapse during sleep (Yang et al., 2022; Čarná & Osmančík, 2021; Okojie et al., 2020; Zhang et al., 2022). Likewise, physical inactivity, sedentary behavior, and poor diet contribute to obesity, one of the strongest predictors of OSA (Liu et al., 2024; World Health Organization, 2024; Barone et al., 2023). Overconsumption of caffeine and other stimulants can disrupt circadian rhythms and worsen sleep quality

(Simon et al., 2023). The World Health Organization (WHO) has underscored the role of behavioral modification in preventing sleep-related disorders, emphasizing physical activity, weight management, and abstinence from tobacco and alcohol as core strategies (World Health Organization, 2024).

Beyond physical habits, holistic lifestyle domains such as psychological well-being, social support, personal safety, and sense of purpose are also deeply intertwined with sleep health. Psychological distress such as anxiety, depression, or chronic stress can heighten cortisol production and disrupt normal sleep architecture, increasing the likelihood of OSA symptoms (Bjorvatn et al., 2021). Meanwhile, strong social connections have been linked to better sleep regulation through emotional stability and stress buffering. A consistent sense of safety, both environmental and emotional, contributes to a calmer autonomic response conducive to restful sleep. Finally, individuals who report a strong sense of purpose often maintain healthier sleep patterns, as purposeful living is associated with better stress regulation, lower inflammation, and enhanced sleep efficiency. Together, these psychosocial domains suggest that sleep apnea is not merely a physiological disorder but a biopsychosocial condition influenced by the interplay of emotional, behavioral, and environmental factors.

Globally, OSA affects nearly one billion adults, with 80–90% of cases remaining undiagnosed (Santilli et al., 2021). The risk increases with age and body weight, and men are more susceptible than women due to anatomical and hormonal differences (Johar et al., 2021; Perger et al.,

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2024). In the Gulf Cooperation Council (GCC) region, including Qatar, OSA prevalence is particularly high due to widespread obesity, sedentary habits, and cultural practices such as late-night socializing and afternoon naps (Vats et al., 2016; Chaabane et al., 2021; Abolaban & Al-Moujahed, 2017). Despite this, awareness and diagnosis remain low (Pantesco & Kan, 2022). In Qatar, the Ministry of Public Health (MoPH) has recognized OSA as a growing health concern, and data from the Qatar Biobank highlight the associations between lifestyle determinants and sleep apnea risk (Al Thani et al., 2019; Khogali et al., 2021). By integrating behavioral and psychosocial perspectives, the findings aim to guide public health initiatives, workplace wellness programs, and gender-specific policies to reduce the prevalence and severity of OSA in the Qatari population. A correlational research design was chosen for this study because it is the most suitable

approach for examining naturally occurring associations between pre-existing lifestyle factors and the risk of OSA without manipulating participants' behaviors. Unlike experimental designs, which require random assignment and intervention, a correlational study allows researchers to explore relationships in a real-world context, respecting the ethical constraints of modifying participants' daily habits or exposing them to potential health risks. This design is particularly appropriate for chronic conditions like sleep apnea, where long-term lifestyle habits and their cumulative effects on health are of interest. By using correlational methods, the study can determine the direction and strength of associations between multiple lifestyle domains physical, psychological, social, safety, and purpose and OSA risk, providing meaningful insights for targeted prevention and public health strategies.

2. Materials and Methods

The purpose of this study was to investigate the relationship between lifestyle factors and the risk of developing sleep apnea. Specifically, the study aimed to understand how various lifestyle choices, sleep quality, and demographic variables contributed to the likelihood of

experiencing sleep apnea. This section discusses the research design, participants of the study, sampling procedure, data-gathering instruments, data-gathering procedures, data analysis, statistical treatment and ethical consideration used in this research.

2.1. Research Design

This study employed a descriptive-correlational research method to examine the relationship between lifestyle factors and the likelihood of developing sleep apnea. According to Walters (2020), descriptive research provided a snapshot of the "current state of affairs," while correlational research examined relationships between variables. This approach was appropriate for understanding how different

lifestyle factors correlate with the probability of developing sleep apnea.

The goal of descriptive research was to provide an accurate representation of the characteristics of a specific individual, situation, or group. Data were first collected to describe occurrences, then organized, tabulated, presented, and interpreted. In contrast, correlational research measured two

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or more variables and assessed their statistical relationship without manipulating any of them.

2.2. Participants and Sampling Procedure

This study focused on the adult population in Qatar, including individuals of various ages, sexes, and nationalities. The total sample size for this study was $n = 60$ adults. Participants were adults aged 18–80 years who were either seeking a diagnosis at a sleep clinic or had been diagnosed with sleep apnea by a medical professional. Pregnant women were excluded to avoid potential confounding effects on sleep quality due to physiological changes.

The study was conducted at a private hospital in Doha, Qatar, involving all eligible patients from

its sleep clinic during the data-collection period. This study employed purposive sampling, a non-probability sampling method in which participants were selected based on pre-specified inclusion criteria and their availability at the clinic. Purposive sampling allows the researcher to identify individuals who are most relevant to the research objectives rather than selecting randomly.

While this approach enables the collection of comprehensive data from the available patient population under study, it does not constitute a truly exhaustive census of all clinic attendees, which limits the generalizability of the findings.

2.3. Research Instruments

To assess various aspects of lifestyle behaviors and the risk of obstructive sleep apnea, this study utilized three main instruments, which were validated by experts. Each instrument was selected based on its validity, reliability, and relevance to the study's objectives.

A modified version of the Pittsburgh Sleep Quality Index (PSQI), originally developed by Buysse et al. (1989), was adapted in this study to assess sleep quality over a 30-day period. To align the instrument with the specific research objectives, the items from the PSQI were selected and modified. This modification streamlined the questionnaire while maintaining its validity in assessing sleep-related concerns.

The Lifestyle Questionnaire – Brief (LHQ-B) was adapted to assess lifestyle habits and health-related attitudes. This contained items across eight domains: health and exercise, psychological health, non-use of substance, nutrition, environmental awareness, social connections, safety, and sense of purpose. This self-administered questionnaire was

comprehensive and appropriate for studying lifestyle factors, as it provided norm-referenced feedback (Smith et al., 2020).

A modified version of the STOP-Bang Questionnaire was adapted in this study to assess the risk of obstructive sleep apnea (OSA) (Chung et al., 2016). The STOP-Bang Questionnaire was initially a binary (yes/no) instrument; however, it was modified to a Likert scale format to facilitate a more nuanced evaluation.

These modifications were implemented to enhance the depth and specificity of participant responses, as well as to improve the overall efficiency of data collection. By utilizing a Likert scale, the study sought to capture a wider range of participant experiences and perceptions related to the risk factors for sleep apnea. The content of the adapted instruments was derived from previously validated measures, thereby ensuring the conceptual integrity and reliability of the items used.

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2.4. Data Gathering Procedure

Data were collected through questionnaires assessing sleep quality, lifestyle factors, and risk for sleep apnea. Literature supports that self-reported data, when combined with objective measures, provide valuable insights into sleep patterns and related factors (Hashim et al., 2022). Participants completed the questionnaires during their hospital visit. The distributed questionnaires were designed to be concise and easy to complete within a short time frame, encouraging participation and ensuring accurate responses.

2.5. Data Analysis

The collected data were systematically organized, tabulated, analyzed, and statistically treated to ensure that the findings were comprehensive and reliable. Initially, descriptive statistics were employed to summarize the essential characteristics of the data. This included computing frequency counts and percentages to describe the participant's demographic profiles (such as age, gender, and ethnicity), as well as calculating the mean and standard deviation for variables related to sleep quality, lifestyle factors, and the risk of sleep apnea. The Spearman rank-order correlation coefficient was utilized to examine the

Participants were recruited directly from the hospital's patient population. To enhance diversity, efforts were made to include individuals without scheduled sleep examinations. Before participation, all volunteers provided informed consent after receiving a detailed explanation of the study's objectives, methodology, potential risks, and benefits, in compliance with ethical guidelines for research involving human participants.

relationship between the study variables. This non-parametric statistical technique was deemed appropriate because it does not require the assumptions of normality or linearity, which are necessary for Pearson's correlation. It was applied to determine the strength and direction of the relationship between lifestyle factors and the risk of sleep apnea. The use of a Likert scale enabled the measurement of participants' responses across a continuum of agreement, making it suitable for analyzing associations among ordinal data. All statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS) version 28

2.6. Ethical Considerations

The study was conducted in accordance with the ethical principles of the Declaration of Helsinki. Due to the research being conducted within a private clinical setting, formal Institutional Review Board (IRB) review was not applicable. Instead, the study received explicit administrative and ethical oversight from the hospital's management prior to data collection. This oversight body verified that the study

adhered to ethical standards and posed minimal risk.

Crucially, all participants provided written informed consent after being fully briefed on the study's purpose, the voluntary nature of their participation, and their right to withdraw at any time without compromising their clinical care. Confidentiality and anonymity of all patient data were strictly maintained.

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3. Results

Descriptive and inferential statistics were used to summarize the demographic characteristics of

the participants, as well as their lifestyle factors, sleep quality, and risk of sleep apnea.

Demographic Characteristics

The majority of participants were male (83.3%), consistent with evidence that men are at higher risk of obstructive sleep apnea (OSA) due to upper airway anatomy and lifestyle behaviors such as smoking and alcohol use (Martins & Sílvia, 2021; Zhao et al., 2022). Hormonal protection may contribute to the lower prevalence among females (Kapur et al., 2020). Most respondents were middle-aged, with 40% aged 50–59 and 26.6% aged 40–49, reflecting the age range most associated with increased OSA risk (Lindberg et al., 2021). The sample

was ethnically diverse, composed primarily of Qataris (40%) and other Arabs (23.3%), followed by South Asians and Westerners. Ethnic differences in obesity, sleep behaviors, and health practices influence OSA prevalence, with Middle Eastern and South Asian populations showing particular vulnerability (Al-Moamary et al., 2020; Sakurai et al., 2021). This diversity enriches understanding of how OSA manifests across cultural and behavioral contexts.

Sleep Quality

The Pittsburgh Sleep Quality Index (PSQI) was adapted to a Likert scale format to assess sleep quality. The scores were interpreted as follows:

Table 1 showed participants generally exhibited poor sleep quality, with a mean score of 3.33 on the adapted PSQI Likert scale. The most common disturbances were difficulty falling asleep, frequent nocturnal awakenings, and excessive daytime sleepiness symptoms consistent with clinical features of OSA. Many also reported discomfort due to temperature

changes, snoring, and frequent bathroom trips. These disruptions contributed to daytime fatigue and reduced enthusiasm for daily tasks, reflecting the systemic consequences of poor sleep (Smith et al., 2020). The findings highlight the need for lifestyle and behavioral interventions aimed at improving sleep hygiene and reducing modifiable OSA risk.

Lifestyle Factors

The Lifestyle and Habits Questionnaire – Brief (LHQ-B) was used to assess participants' lifestyle habits. The scores were interpreted as follows:

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Table 2. Lifestyle Factors of Participants

	Factors	Participants		
		SD	WM	Interpretation
1.	Health and Exercise	0.59	2.23	UL
2.	Psychological Health	0.64	2.34	UL
3.	Non-use of Substance	0.37	2.09	UL
4.	Nutrition	0.72	2.40	UL
5.	Environmental Awareness	0.89	2.68	HL
6.	Social Connections	0.89	2.70	HL
7.	Safety	0.97	3.15	HL
8.	Sense of Purpose	0.82	3.51	VHL
	Overall	0.83	2.64	HL

Note. Legend: 3.26–4.00 (Very Healthy Lifestyle–VHL); 2.51–3.25 (Healthy Lifestyle–HL); 1.76–2.50 (Unhealthy Lifestyle–UL); 1.00–1.75 (Very Unhealthy Lifestyle–VUL)

Table 2 reveals that the overall lifestyle profile ($M = 2.64$) indicated a moderately healthy lifestyle, though notable deficiencies were observed. Domains such as health and exercise, psychological health, non-use of substances, and nutrition fell within the “unhealthy lifestyle” category, suggesting suboptimal physical activity levels, stress management, and dietary habits. Conversely, participants demonstrated stronger outcomes in environmental awareness, social connections, and safety, each within the

“healthy lifestyle” range. Of particular note was the sense of purpose, rated as “very healthy,” reflecting strong psychological resilience and direction in life factors that can buffer stress and promote better sleep via neuroendocrine mechanisms, such as moderated cortisol secretion and improved circadian stability (Hayes & Ciarrochi, 2015). These findings emphasize that psychosocial well-being is an important, yet often overlooked, determinant of sleep health.

Risk of Sleep Apnea

The STOP-Bang Questionnaire was adapted to a Likert scale format to assess the risk of obstructive sleep apnea (OSA). The scores were interpreted as follows:

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Table 3. Risk of Sleep Apnea among Participants

Indicators		Participants		
		SD	WM	Interpretation
1.	How often do you snore loudly (louder than talking or loud enough to be heard through closed doors)?	0.25	3.93	VHR
2.	Do you often feel tired, fatigued, or sleepy during the daytime (such as falling asleep while driving or talking to someone)?	0.22	3.95	VHR
3.	Has anyone observed you stop breathing or choking/gasping during your sleep?	0.22	3.95	VHR
4.	Do you have or are you being treated for high blood pressure?	0.39	3.82	VHR
5.	Is your BMI more than 35 kg/m ² ?	0.45	3.73	VHR
6.	Is your neck circumference greater than 40 cm?	0.62	3.40	VHR
Overall		0.43	3.80	VHR

Note. Legend: 3.26–4.00 (Very High Risk–VHR); 2.51–3.25 (High Risk–HR); 1.76–2.50 (Low Risk–VR); 1.00–1.75 (Very Low Risk–VLR)

Table 3 reveals that participants were classified as being at a very high risk for OSA (M = 3.80), based on the adapted STOP-Bang scores. Loud snoring, excessive daytime fatigue, and observed breathing pauses were common symptoms, while comorbid conditions such as hypertension and obesity (BMI > 35 kg/m²) were also

prevalent. Elevated neck circumference (>40 cm) further compounded risk. These results underscore the widespread presence of undiagnosed or unmanaged sleep-disordered breathing, a condition strongly linked to cardiovascular morbidity and impaired cognitive performance (Chung et al., 2016).

Spearman Rank-Order Correlation Coefficient

The Spearman Rank-Order Correlation Coefficient was used to determine the strength and direction of the relationships between lifestyle factors and the risk of sleep apnea. The correlation table presents the

Table 4. The Significant Relationship Between Lifestyle Factors and Risk of Sleep Apnea

	Factors	r	p	Interpretation	Strength	Direction
1.	Health and Exercise	-.43	< .001	Significant	Moderate	Negative
2.	Psychological Health	-.64	< .001	Significant	Strong	Negative
3.	Non-use of Substance	-.22	.090	Not Significant	/	/
4.	Nutrition	-.49	< .001	Significant	Moderate	Negative
5.	Environmental Awareness	-.75	< .001	Significant	Strong	Negative
6.	Social Connections	-.57	< .001	Significant	Strong	Negative
7.	Safety	-.73	< .001	Significant	Strong	Negative
8.	Sense of Purpose	-.81	< .001	Significant	Strong	Negative
	Overall	-.76	< .001	Significant	Strong	Negative

Note. The p-value is significant below alpha .05. Legend: Less than -.5 (Strong); Between -.3 and -.5 (Moderate); Between 0 and -.3 (Weak)

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associations between lifestyle factors and the risk of sleep apnea, highlighting the nature and degree of these relationships.

Table 4 shows the Spearman rank-order correlation revealed a strong negative relationship between overall lifestyle and risk of OSA ($r = -.76$, $p < .001$), indicating that healthier lifestyles correspond with lower OSA risk. Among the lifestyle domains, the sense of purpose ($r = -.81$), safety ($r = -.73$), and environmental awareness ($r = -.75$) demonstrated the strongest inverse correlations. These findings reinforce the importance of psychosocial stability and structured daily living as protective factors against OSA likely through mechanisms involving stress regulation, social support, and consistent sleep–wake routines (Bjorvatn et al., 2021).

Physical and mental health dimensions, such as exercise, nutrition, and psychological well-being, also exhibited significant negative correlations with OSA risk, underscoring the interdependence of body and mind in sleep health. The non-use of substances variable was the only domain showing a non-significant relationship ($r = -.22$, $p = .090$). This outcome may be attributed to cultural and reporting factors in Qatar, where social norms discourage open disclosure of alcohol and tobacco use.

4. Discussion

This study revealed significant relationships between lifestyle factors and the risk of obstructive sleep apnea (OSA) within a diverse population. The demographic profile reflected existing literature, with most participants being male (83.3%) and middle-aged (40–59 years) groups known to have higher OSA risk due to anatomical, hormonal, and behavioral factors

Objective biochemical measures or anonymous survey methods may yield more accurate assessments in future studies.

These findings highlight the critical role of lifestyle modification and psychosocial support in mitigating OSA risk. Given the predominance of male participants and their higher physiological susceptibility, gender-targeted health policies such as workplace wellness initiatives, sleep health education, and men's health campaigns are warranted. Programs emphasizing physical activity, mental health awareness, and stress management could substantially reduce OSA prevalence and improve overall quality of life.

On a broader scale, integrating sleep health promotion into Qatar's national non-communicable disease (NCD) framework would help address the interconnected risks of obesity, hypertension, and cardiovascular disease. Strengthening early screening and culturally sensitive education campaigns can promote better recognition and management of sleep apnea across diverse communities.

such as alcohol and tobacco use (Martins & Sílvia, 2021; Kapur et al., 2020; Zhao et al., 2022). The inclusion of Qatari and other Arab respondents emphasized regional relevance, as obesity and sedentary lifestyles are common risk factors in these populations (Al-Moamary et al., 2020; Sakurai et al., 2021).

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Poor sleep quality and high STOP-Bang scores indicated that many participants were at very high risk for OSA, with symptoms such as loud snoring, daytime fatigue, and observed apneas aligning with sleep-disordered breathing patterns (Smith et al., 2020). Lifestyle assessments showed moderate health behaviors but deficiencies in exercise, nutrition, and psychological well-being, consistent with global evidence linking sedentary behavior and stress to sleep dysfunction (de Moura et al., 2025).

A strong negative correlation was found between lifestyle factors and OSA risk, particularly in domains like sense of purpose and environmental awareness, suggesting that psychosocial well-being may help protect

against OSA by enhancing stress regulation and sleep quality (Bjorvatn et al., 2021). Substance use showed no significant association, likely due to cultural norms and underreporting in Qatar's conservative context.

Overall, the findings support a biopsychosocial model of OSA, highlighting the importance of integrating physical, psychological, and behavioral health strategies. Public health efforts should include gender-targeted wellness programs, stress management initiatives, and lifestyle interventions aligned with Qatar's Ministry of Public Health priorities to reduce OSA prevalence and improve population well-being.

5. Conclusion

This study found that lifestyle factors particularly psychological well-being, safety, and life purpose showed a strong negative correlation with sleep-apnea risk. The study highlighted the high prevalence of poor sleep quality and very high risk of obstructive sleep apnea among middle-aged male participants, particularly within Arab and South Asian populations. The results demonstrated a clear and significant negative correlation between healthy lifestyle behaviours especially those related to psychological well-being, safety, social connection, and life purpose and the risk of sleep apnea.

These findings underscore the importance of a comprehensive approach to OSA prevention and management. While clinical interventions remain critical, enhancing lifestyle behaviours such as physical activity, nutrition, mental-health support, and community engagement may serve as powerful adjuncts in reducing sleep-related health burdens.

Healthcare providers and public-health stakeholders in the region should consider implementing multidisciplinary screening and intervention programmes that address both physiological and behavioural dimensions of sleep health. Specifically, clinical practice should integrate lifestyle screening (for example, using the LHQ-B in sleep clinics) to identify high-risk patients for targeted behavioural interventions. Future research should aim to strengthen these findings in broader and more diverse populations and explore the longitudinal effects of lifestyle modifications on OSA outcomes. Intervention-based and longitudinal designs are needed to establish causal relationships. These recommendations align with the World Health Organization (WHO) and the Qatar Ministry of Public Health (MoPH-Qatar) focus on addressing key non-communicable disease risk factors.

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6. Limitations of the Study

This study is subject to several limitations that should be considered when interpreting the findings. Firstly, the research focused exclusively on a selected adult population in Doha, Qatar, excluding younger individuals and pregnant women. As a result, the generalizability of the findings to these specific groups is limited. A primary constraint is the small sample size ($n = 60$), which limits the statistical power of the study. Furthermore, the cross-sectional design of the study only captures a single point in time, meaning that a causal relationship between lifestyle factors and sleep apnea risk cannot be inferred. Secondly, while

standardized instruments such as the Pittsburgh Sleep Quality Index (PSQI) and the STOP-Bang Questionnaire were employed; these tools were adapted for the study and relied primarily on self-reported data. This adaptation, including the Likert-scale conversion, may have influenced the original construct validity of the instruments and requires further psychometric validation in the local context. The inherent subjectivity of self-reporting might have introduced recall bias or social desirability bias, potentially affecting the reliability and accuracy of the data on sleep quality and lifestyle behaviors.

Supplementary Details

1. Supplementary Materials & Data Availability Statement:

Not applicable.

2. Author Contributions:

- Conceptualization: Ronalyn N. Cabildo, Jena Joy M. Fernandez
- Methodology & Data Gathering: Ronalyn N. Cabildo, Jena Joy M. Fernandez
- Statistical Analysis: Ken Paul M. Espinosa
- Writing – Original Draft (Chapters I–IV): Ronalyn N. Cabildo, Jena Joy M. Fernandez
- Writing – Review & Editing: Cecilia C. Yasa, Maria Lourdes C. Policarpio
- Supervision: Cecilia C. Yasa, Maria Lourdes C. Policarpio

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4. Institutional Review Board (IRB) Statement:

Not applicable.

5. Informed Consent Statement:

Informed consent was obtained from all participants prior to answering the questionnaire.

6. Acknowledgments:

None.

7. Conflicts of Interest:

The authors declare no conflict of interest.

8. Disclosure Statement (Use of AI Tools):

All AI-assisted content has been reviewed and validated by the authors.

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