

Exploring the Level of Self-Care Behavior, Motivation, and Self-Efficacy among Individuals With Hypertension: A Cross-Sectional Study

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Abstract

Introduction: Hypertension is a serious public health issue. It is a significant but controllable factor in the emergence of cardiovascular disease. Controlling hypertension is a main target for individuals to prevent further illness.

Objective: This study aims to explore the level of self-care behaviors, motivation, and self-efficacy among individuals with hypertension.

Methods: A cross-sectional, descriptive, correlational design was used to recruit ($n = 121$) participants utilizing the Hypertension Self-Care Profile (HTN-SCP) questionnaire.

Results: The analysis revealed that the mean score of self-care behavior was 49.7 ($SD = 10.0$) out of 20–80, which indicates that they are likely to have good self-care behavior. The mean score of motivation for self-care was 59.7 ($SD = 11.8$) out of 20–80, reflecting that individuals with hypertension have a good level of motivation for self-care, and the mean score of self-efficacy was 70.0 ($SD = 9.8$) out of 20–80, which means that individuals with hypertension have a high level of self-efficacy. Also, there was a significant positive correlation between self-care behavior and motivation for self-care ($r = .527, p < .001$), between motivation for self-care and self-efficacy ($r = .554, p < .001$), and between self-efficacy and self-care behavior ($r = .572, p < .001$).

Conclusion: The study revealed that Jordanian patients with hypertension have good self-care practices, motivation, and high self-efficacy. Patients should therefore be strongly recommended to be compliant with self-care practices. The government should prioritize hypertensive patients by making it easier for them to receive information about self-management practices to improve their quality of care.

Keywords

self-care profile, behaviors, self-efficacy, motivation, hypertension

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Introduction

Worldwide, hypertension is a controllable risk factor for developing heart, brain, and circulatory illnesses (Galiè et al., 2019; Hani & Ahmad, 2023a). Due to its high incidence and related mortality and morbidity, hypertension has a relatively high burden (Vousden et al., 2019). In a study performed by Zaki et al. (2020), it was pointed out that by 2030, the prevalence of hypertension is predicted to rise by 7.2% compared to the year 2013, which reached

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3.4%. Nearly 30% of adults in Arab countries are diagnosed with HTN. A follow-up study that was conducted in Jordan compared the prevalence of HTN from 1994 to 2009, and it was found to increase from 29.4% to 32.3% (Jaddou et al., 2011).

Review of Literature

Globally, problems from hypertension are thought to be the cause of 9.4 million fatalities annually, and by 2025, that number may rise to 1.58 billion adults, with the majority residing in low- and middle-income nations (Zaki et al., 2020). According to the World Health Organization (WHO), hypertension is diagnosed when a person's measured blood pressure is found to be 140/90 mmHg (millimeters of mercury) or higher on two different days, or an ambulatory blood pressure daytime average or home blood pressure average of 135/85 mmHg or higher (Hani & Ahmad, 2023b; WHO, 2022). Besides, it was reported that adults with hypertension are unaware of their condition, while those who were diagnosed and treated formed only 42% of cases (Mirzaei et al., 2020). Modifying lifestyle, which includes weight reduction, a nutritious diet high in potassium and low in sodium, exercising regularly, and quitting smoking, is the first line of treatment for hypertension (Umamura et al., 2019). However, if lifestyle changes are insufficient to achieve the desired BP, drug therapy is required, including diuretics, angiotensin-converting enzyme inhibitors (ACE), angiotensin receptor blockers (ARBs), beta-blockers, and calcium channel blockers (CCBs), which are the first-line drugs used to treat hypertension (Zhu et al., 2022), and in some cases, patients will need to take two or more antihypertensive drugs (Wright et al., 2018). Hence, adults are advised to adopt new lifestyle habits to improve blood pressure control because treatment alone is ineffective in many cases.

Individual lifestyle factors can each lower blood pressure in a different way, which can help pharmacologic therapy work better (Motlagh et al., 2016a). All the actions people take to keep up a healthy lifestyle, manage long-term conditions, and contribute significantly to the promotion and preservation of their health are considered self-care activities (Durand et al., 2017). However, controlling blood pressure is suboptimal despite the availability of both pharmacologic and non-pharmacologic treatment strategies (Niriayo et al., 2019).

Besides, several studies revealed low self-care behaviors among hypertensive individuals (Motlagh et al., 2016b; Zare et al., 2019). For instance, in a cross-sectional Jordanian study conducted by Alefan et al. (2019), it was revealed that only 23% of the patients fully adhered to recommended healthy living practices, nearly 95% were educated about hypertension, and 86% had positive views of the treatment methods for their condition. Surprisingly, only one-third of that population adhered to their antihypertensive

medication, which reveals the gap in the management of HTN in Jordan. Uncontrolled HTN in Jordan is clearly explained by not relying on evidence-based practice management and poor medication adherence. Additionally, a qualitative study was conducted by Dwairej et al. (2020), aiming at understanding self-care practices and adherence among Jordanian hypertensive patients. A category of self-care was outlined as a central phenomenon that started from the moment of being diagnosed with HTN as a causal condition; beliefs, knowledge, and awareness toward the disease as strategies, and then the consequences of the disease, which were outlined as self-care practices within the social context.

The main barrier that restricts self-care is the lack of motivation among individuals to change their behavior (Wahyudi, 2020). Among those individuals, increasing motivation and, consequently, involvement in self-care behaviors, may be facilitated by self-efficacy, which is known as the person's confidence in himself or herself and the ability to conduct actions required to create particular "performance achievements" (Khairy et al., 2021).

Although numerous studies on hypertensive patients have been carried out in Jordan (Al-Daken & Eshah, 2017; Al-Hadeethi et al., 2022; Jordan et al., 2019), none of them have addressed the patients' self-efficacy, self-care behaviors, or motivation. Hence, this study aims to explore the level of self-care behaviors, self-efficacy, and motivation among Jordanian hypertensive patients. To improve care and lower the risk of complications, hypertension patients must have their self-care practices and self-efficacy evaluated, since it enables healthcare professionals to personalize interventions, effectively educate patients, and equip them with the tools they need to take charge of their health. As a result, individuals with hypertension experience better results and a higher quality of life.

Methods

Design

A descriptive, cross-sectional, correlational design was used.

Settings and Sampling

The study participants were residents of all governorates in the Kingdom. The sample size was calculated using G*Power, which shows that the minimum required sample was 100 participants based on $\alpha = .05$, power = .80, and moderate effect size = .30 (Faul et al., 2009). However, a larger number of participants were collected to compensate for the attrition rate that could happen during the data collection process. A random sample of different governorates was drawn to form the study cluster utilizing an online survey (Google Forms platforms). Then the survey was distributed using various channels, including social media and website links. An introductory text was written at the beginning of

the survey to ensure that participants met the requirements of this study. A random sample of 121 participants was obtained.

Inclusion Criteria

The inclusion criteria were (1) all Jordanian participants who could read and write, (2) aged more than 18 years, and (3) approved to participate in this study.

Instrument

Data were collected over 3 months, from May 2023 to August 2023, using the Hypertension Self-Care Profile (HTN-SCP) questionnaire. It is a self-administrated tool consisting of 60 items divided into three sections, developed by Han et al. (2014). The questions begin with the following stems for each section that was rated using a Likert scale from 1 to 4: How frequently do you do something? "Self-care behavior with 20 items," how important do you think it is to do something? "Motivation," and how confident are you in doing something? "Self-efficacy"? Each scale's items were written at a sixth-grade reading level, and they can be used separately for each section or together (Chen et al., 2014). The questionnaire was back-translated into Arabic by a group of bilingual experts until the Arabic and English versions were compatible.

The scoring system is based on adding the scores for each question on the HTN-SCP together, except items C15 and C16, which must be recorded. Higher scores for each measure indicate higher levels of hypertension self-care behavior, motivation for hypertension self-care, and self-efficacy, with scores ranging from 20 to 80 for each instrument.

The reliability and internal consistency were assessed, revealing that behavior has a Cronbach's alpha of .83, motivation .93, and self-efficacy .91, indicating good reliability. Besides, coefficients of internal consistency and dependability ranged from 0.83 to 0.93 (Han et al., 2014). For the current study, for the first domains of self-care behaviors, Cronbach's alpha was .83; for the motivation domains, it was .94; and for the self-efficacy domains, it was .95.

Data Collection Procedure

After getting approval from the Ministry of Health (#MOH/REC/2022/102), the clinical departments were contacted to collect hypertensive patients' information. Patients who met the inclusion criteria were contacted via their WhatsApp application to send them the link to be filled out. The purpose of the study, risks, and benefits was fully explained on the first page of the questionnaire. They were informed that the estimated time for filling out the questionnaire was 15–20 min. Anonymity and confidentiality were maintained during the data collection process. The data that was filled in was stored on a locked computer with a password that was only accessible by the researcher who

analyzed the data. The questionnaire's internal reliability Cronbach's alpha was assessed in a pilot test where 20 participants were enrolled to test the questionnaire for reliability, clarity, and time required to complete it and found that the scale Cronbach's $\alpha = .89$. Additionally, the questionnaire took around 15 min to be filled. All participants were Jordanian adults including young and middle-aged groups, able to read and write, and doing regular physical activities. These characteristics help in tailoring interventions, understanding barriers to effective self-care, and analyzing the results of the study more accurately.

Statistical Analysis

Data analysis was performed using the Statistical Package of Social Science (SPSS) version 26. Data coding was completed, taking into account the variable's level of measurement. After completing the data entry, data screening was done to check for any missing data, inconsistencies, or outliers. For all statistical analyses, the level of significance was $p < .05$. Descriptive statistics were used to describe the characteristics of the study's socio-demographic characteristics, such as mean, standard deviation, and ranges. Inferential statistics of Pearson correlation were used to explore the relationship between self-care behavior, motivation, and self-efficacy among individuals with hypertension. Additionally, a multivariable regression was performed to determine the predictors of age, gender, marital status, education, monthly income, medication adherence, smoking, and primary care provider had a statistically significant association with self-care behavior, motivation for self-care, and self-efficacy among individuals with hypertension.

Results

Sample Characteristics

A total of ($n = 121$) patients with hypertension were recruited in this study. It was revealed that ($n = 90, 74.7%$) of participants were males and ($n = 31, 25.6%$) were females. The majority of patients ($n = 69, 57.0%$) were between the age of 41 and 60 years, while ($n = 38, 31.4%$) were between the ages of 19 and 40, and the minority were older than 61 years ($n = 14, 11.6%$). The majority of patients ($n = 109, 90.1%$) were married. More than half of the participants have completed a Bachelor's and higher education ($n = 71, 58.6%$). The majority of patients ($n = 52, 43.0%$) were between the incomes of 251 and 500 Jordanian Dinar (JOD), and ($n = 34, 28.1%$) were between the incomes of 501 and 1,000 JOD. Furthermore, the majority of the patients have medical insurance ($n = 102, 84.3%$), smokers ($n = 63, 52.1%$), and adhere to their prescribed medication ($n = 97, 80.2%$) (Table 1).

The current study revealed that the overall mean score of self-care behavior among individuals with hypertension was ($M = 49.7, SD = 10.0$), which indicates that they are likely to have good self-care behavior. For motivation of self-care, it

was ($M = 59.7$, $SD = 11.8$), reflecting the good level of motivation for self-care amongst individuals with hypertension. Additionally, the overall mean score of self-efficacy was ($M = 70.0$, $SD = 9.8$), which means that individuals with hypertension have a high level of self-efficacy (Table 2).

Table 1. Patients' Socio-Demographic and Health-Related Information ($N = 121$).

Variables	Categories	F (%)
Age	19–40	38 (31.4)
	41–60	69 (57.0)
	≥61	14 (11.6)
Gender	Male	90 (74.4)
	Female	31 (25.6)
Marital status	Single	9 (7.4)
	Married	109 (90.1)
	Divorced	1 (0.8)
	Widowed	2 (1.7)
Education level	Secondary school	25 (20.7)
	Diploma	25 (20.7)
	Undergraduate	71 (58.6)
	Postgraduate	0 (0.00)
Medical insurance	Yes	102 (84.3)
	No	19 (15.7)
Monthly income	≤250	11 (9.1)
	251–500	52 (43.0)
	501–1,000	34 (28.1)
	≥1,001	24 (19.8)
Primary care provider	Independent	95 (78.5)
	Wife/husband	20 (16.5)
	Son/daughter	2 (1.7)
	Other	4 (3.3)
Smoking status	Yes	63 (52.1)
	No	58 (47.9)
Medication adherence	Non-adherence	24 (19.8)
	Adherence	97 (80.2)
Having other chronic disease	Yes	53 (43.8)
	No	68 (56.2)

Note. N = number; % = percentage; F = frequency.

Table 2. Levels of Hypertension Self-Care Behavior, Motivation, and Self-Efficacy Among Patients With Hypertension ($N = 121$).

Self-care profile items	Total possible scores	M (SD)	Min.	Max.	Level
Self-care behavior	20–80	49.7 (10.0)	26	80	Moderate
Motivation for self-care	20–80	59.7 (11.8)	34	79	Moderate
Self-efficacy	20–80	70.0 (9.80)	40	80	High

Note. M = mean; SD = standard deviation; Min. = minimum; Max. = maximum.

Our results showed that a significant positive correlation was found between self-care behavior and motivation for self-care ($r = .527$, $p < .001$), suggesting that increased motivation for self-care was associated with increased self-care behavior among individuals with hypertension. Also, there was a significant positive correlation between motivation for self-care and self-efficacy ($r = .554$, $p < .001$), indicating that increased motivation for self-care was correlated with increased self-efficacy among individuals with hypertension. Furthermore, there was a significant positive correlation between self-efficacy and self-care behavior ($r = .572$, $p < .001$), reflecting that increased self-efficacy was associated with increased self-care behavior among individuals with hypertension (Table 3).

A multivariable regression analysis was performed to determine the predictors of age, gender, marital status, education, monthly income, medication adherence, smoking, and primary care provider had a statistically significant association with self-care behavior, motivation for self-care, and self-efficacy among individuals with hypertension. The assumptions of regression were checked by assessing multicollinearity by using the variance inflation factor (VIF) for each independent variable, and a VIF value greater than 1.5 indicates multicollinearity. Also, the autocorrelation assumption was determined using the Durbin Watson (DW) test, which was 0.96, indicating positive and acceptable autocorrelation. Furthermore, the residual values are normally distributed, and there is a linear relationship between the dependent and independent variables.

As explained in Table 4, the whole model of self-care behavior that included all predictors of age, gender, marital status, education, monthly income, medication adherence, smoking, and primary care provider was statistically significant ($F = 3.181$; $p < .001$; $R = .430$; $R^2 = .185$; adjusted $R^2 = .127$). This means that the entire model explained 18.5% of the variance in self-care behavior. The results showed that medication adherence ($B = -.274$; $p = .005$) and smoking ($B = .250$; $p = .008$) were significant predictors of self-care behavior among individuals with hypertension, which means increased medication adherence and controlling smoking were correlated with increased self-care behavior.

Table 3. Correlation Between Self-care Profile Items Among Patients With Hypertension ($N = 121$).

Variable	Self-care behavior		Motivation for self-care		Self-efficacy	
	r	p	r	p	r	p
Self-care behavior	1		.527	.000**	.572	.000**
Motivation for self-care	.527	.000**	1		.554	.000**
Self-efficacy	.572	.000**	.554	.000**	1	

**Correlation is significant at ≤ 0.01 .

The shading signifies the correlation between self-care behavior and self-care behavior is ($r = 1$) with no p -value.

Table 4. Multivariable Linear Regression Analysis for Predictors of Self-Care Behavior, Motivation for Self-Care, and Self-Efficacy.

Variables		Unstandardized coefficients		Standardized coefficients	t	p	95% CI		F	p	R	R ²	Adjusted R ²
		B	SE	β			Lower	Upper					
Self-care behavior	Age	0.960	1.529	.060	0.628	.531	-2.069	3.989	3.181	.003	.430	.185	.127
	Gender	-0.180	2.245	-.008	-0.080	.936	-4.628	4.269					
	Marital status	-1.685	2.471	-.065	-0.682	.497	-6.581	3.210					
	Education	1.259	1.363	.102	0.924	.358	-1.442	3.960					
	Income	1.595	1.129	.145	1.412	.161	-.642	3.832					
	Medication adherence	-6.817	2.363	-.274	-2.885	.005	-11.498	-2.136					
	Smoking	4.967	1.844	.250	2.693	.008	1.313	8.620					
	Primary care provider	-1.011	1.336	-.068	-0.757	.451	-3.659	1.636					
Motivation for self-care	Age	1.431	1.717	.076	0.834	.406	-1.971	4.833	5.202	.000	.520	.271	.219
	Gender	3.315	2.522	.123	1.315	.191	-1.682	8.312					
	Marital status	-0.303	2.775	-.010	-0.109	.913	-5.801	5.196					
	Education	-0.272	1.531	-.019	-0.178	.859	-3.306	2.762					
	Income	2.028	1.268	.156	1.599	.113	-0.485	4.541					
	Medication adherence	-13.078	2.654	-.442	-4.928	.000	-18.336	-7.820					
	Smoking	0.433	2.071	.018	0.209	.835	-3.671	4.537					
	Primary care provider	2.450	1.501	.138	1.632	.105	-0.524	5.423					
Self-efficacy	Age	1.051	1.490	.068	0.705	.482	-1.902	4.004	3.316	.002	.438	.192	.134
	Gender	-1.380	2.189	-.062	-0.630	.530	-5.717	2.958					
	Marital status	-0.137	2.409	-.005	-0.057	.955	-4.910	4.635					
	Education	1.016	1.329	.084	0.764	.446	-1.617	3.649					
	Income	1.083	1.101	.101	0.984	.327	-1.098	3.264					
	Medication adherence	-5.220	2.303	-.214	-2.266	.025	-9.784	-0.656					
	Smoking	6.574	1.798	.338	3.657	.000	3.012	10.136					
	Primary care provider	0.007	1.303	.000	0.005	.996	-2.574	2.588					

Note. B = unstandardized coefficients; β = standardized coefficients; CI = confidence interval; R = multiple correlation coefficients; R² = coefficient of determination; F: F-ratio in the ANOVA.

Additionally, Table 4 explains that the whole model of motivation for self-care that included all predictors of age, gender, marital status, education, monthly income, medication adherence, smoking, and primary care provider was statistically significant ($F = 5.202$; $p < .001$; $R = .520$; $R^2 = .271$; adjusted $R^2 = .219$). This means that the entire model explained 21.9% of the variance in motivation for self-care. The results showed that medication adherence ($B = -0.442$; $p < .001$) was a significant predictor of motivation for self-care among individuals with hypertension, which means increased medication adherence was correlated with increased motivation for self-care. Furthermore, it was clarified that the whole model of self-efficacy that included all predictors of age, gender, marital status, education, monthly income, medication adherence, smoking, and primary care provider was statistically significant ($F = 3.316$; $p = .002$; $R = .438$; $R^2 = .192$; adjusted $R^2 = .134$). This means that the entire model explained 19.2% of the variance

in self-efficacy. The results showed that medication adherence ($B = -0.214$; $p = .025$) and smoking ($B = 0.338$; $p < .001$) were significant predictors of self-efficacy among individuals with hypertension. which means increased medication adherence and controlling smoking were correlated with increased self-efficacy (Table 4).

Discussion

This study's main goal was to explore the association between the main aspects of self-care profiles among Jordanian patients with hypertension. It was found that self-care behaviors, motivation for self-care, and self-efficacy were positively related to each other. Hypertension self-care habits are intricate and entail a variety of activities, such as adhering to a prescribed diet, taking prescribed medicine, exercising, controlling blood pressure, and eating food with low salt and low saturated fat. However, adherence to

self-care practices is challenging among hypertensive patients due to their intricacy. According to the study's findings, self-efficacy is positively connected with self-care behaviors and motivation to self-care, meaning that adults with higher self-efficacy adhere to self-care practices with high motivation more consistently. These findings were consistent with a study conducted by Warren-Findlow et al. (2012), who found that more than half (59%) of the participants reported they were well-equipped to control their hypertension. Positive self-efficacy was substantially linked to higher rates of medication adherence, a low-salt diet, physical activity, quitting smoking, and the use of weight-reduction strategies. For African Americans with hypertension, compliance with five out of the six recommended self-care activities is substantially correlated with hypertension self-efficacy. Also, a systematic review study was performed by Tan et al. (2021) that included 21 studies that aimed to analyze the strength of the evidence that exists to support the link between self-efficacy and self-care behavior engagement among patients with hypertension. It was found that self-care behaviors like medication adherence, physical activity, and dietary adjustments were all related to higher levels of self-efficacy and motivation for self-care. So, the findings of the current study could be related to the feeling of adult patients who have hypertension that they should take care of themselves throughout their lives because it cannot be treated and must be regulated. Over time, they could grow weary and disregard self-care practices. They will benefit from their growing self-efficacy in overcoming obstacles and implementing self-care practices effectively to improve their quality of life and perform their activities of daily living appropriately.

In addition, this study showed that an adult with hypertension was taking the required dosage of medication since they were concerned about potential complications that could arise from an improper dosage. This is consistent with a study that was performed by Adiyasa and Cruz (2020), who reported that patients with hypertension were compliant with taking their prescribed medication. However, patients with hypertension tried to quit taking medication when they feel their health is better or their blood pressure is under control, in the hopes that this will be the turning point for them to stop using blood pressure medication.

Besides, this study shows that a whole model of self-care strategies, motivation, and self-efficacy has a statistical significance with socio-demographic characteristics of age, sex, marital status, education, monthly income, smoking, and primary care provider. These findings were in line with a study performed by Abdisa et al. (2022) who assessed the predictors of self-care behaviors and self-efficacy among patients with hypertension and found that strong social support from the primary care providers, being older than 40 years, having strong fundamental knowledge about hypertension management, and being able to manage stress were all connected favorably with hypertensive self-care

behaviors and self-efficacy. These results may be explained by the fact that adults over 40 have a greater desire to manage their blood pressure and a higher degree of awareness as a result of learning a lot during follow-up visits with their doctors.

Also, having strong social support from care providers is strongly associated with positive self-care practices, motivation, and self-efficacy among patients with hypertension. These findings are also consistent with a study that mediates the role of social support performed by Bahari et al. (2019), who concluded that self-care behaviors for hypertension were substantially correlated with social support and self-efficacy and that the link between family social support and hypertension self-care behaviors was mediated by self-efficacy. This conclusion is supported by the fact that patients with hypertension must have significant social support in order to increase team-based care and task-shifting tactics while controlling their condition. People in this scenario have a strong social support system and are often open to discussing social issues.

The current study's finding that social support helps people cope better with daily life and aids beneficiaries in returning to normal lives is supported by the WHO self-care intervention guidelines (Organization, 2019).

On the other hand, these findings contradicted the findings of a study conducted by AlHadlaq et al. (2019) in primary healthcare centers in the Riydi region of Saudi Arabia, who discovered that patients with hypertension had low levels of self-efficacy and self-care behaviors since their most common excuse for not taking antihypertensive drugs was forgetting to take them. Also, around 27.3 percent lacked the time to exercise, and 38.5 percent did not limit their salt intake. More than half of the patients (51.3%) lacked the motivation to exercise frequently, while 56.7% lacked the motivation to consume less salt.

A key strategy to enhance long-term adherence to the advised lifestyle adjustments for hypertension is self-care behaviors and practices. This study has implications for researchers who wish to determine the impact and timing of unfavorable outcomes among persons who engage in poor self-care behaviors.

Limitations

This study has some limitations. Firstly, a convenience sample was recruited, limiting the generalizability of the findings. Additionally, self-report questionnaires were used to collect data for the study, which may have contributed to issues with recall bias and desirability, particularly for self-care practices that change frequently.

Implications for Practice

This study has several implications for both individuals and healthcare system. Healthcare professionals can more effectively

customize interventions and support systems if they have a better understanding of the variances in self-care behavior and motivation. For instance, more extensive support or motivational interviewing approaches may be beneficial for people who lack motivation or self-efficacy. In addition, the findings can highlight the need for educational programs that not only provide information about hypertension management but also aim to increase self-efficacy and motivation. This could involve teaching problem-solving skills, and stress management techniques.

Conclusion

A favorable level of self-care behaviors, motivation, and self-efficacy among Jordanian patients with hypertension was revealed in this study. Self-care profiles were found to be strongly associated with each other. Age, gender, marital status, education, monthly income, medication adherence, smoking, and primary care provider were significant predictors of self-care practices, motivation, and self-efficacy among patients with hypertension.

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Author Contributions

SBH: conceptualization and writing the draft of the paper. MAAS: data analysis and drafting the paper. MNA: methodology. AEA: editing. EAAA: drafting and editing.

Data Availability Statement

Data are available upon request.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical Approval

Each study participant signed an informed consent prior to participation in the study.

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