MODELLING QUALITY OF LIFE HYPERTENSIVE PATIENT

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ABSTRACT

Hypertension (HT) still become silent killer disease leading to mortality. Although many efforts and programs of HT increase blood pressure control, but internal factors such as age, gender, duration of illness (DOI), attitude, medication adherence (MA), routine check-up (RCU), and blood pressure (BP) still play important role to enhancing blood pressure control and even more so the quality of life (QoL) hypertensive patients. This research aims to testing a hypothetic modelling of previous research to find an internal factors model of QoL in hypertensive patients. Cross-sectional study used to 89 samples randomize due to online questionnaire collecting data. Correlation used to eliminate variables which did not significant adding to the model. Then model testing by partial-least square analysis. The result shows that attitude directly affect the MA and RCU significantly, also MA to BP and BP to QoL, but interestingly did not significant in RCU to BP. As addition, it has significant effect as attitude to BP through MA, MA to QoL through BP, and so simultaneously attitude to QoL with MA and BP as intervening. So, it becomes very important as nurses to empower patient's attitude to manage and maintain their lifestyle with their hypertensive condition to enhance their adherence in medication so they blood pressure in controlled and will have a good quality of life.

Keywords: Attitude, Blood Pressure, Hypertension, Medication Adherence, Quality of Life

INTRODUCTION

HT is a condition of increased pressure in the blood. The diagnosis of HT is established when systolic blood pressure exceeds 140 mmHg and diastolic 90 mmHg (Hastuti, 2019). *The World Health Organization* (*WHO*) (2019) noted that there was an increase in the number of people with HT from 1990 to 2019. Hypertensive patients aged 30-79 years from 650 million to 1.28 billion. In 1990, 331 million women and 317 million men increased in 2019 to 626 million women and 652 million men. Globally, HT management in women was 41% undiagnosed, 59% diagnosed, 47% treated and 12% untreated. In those who treated, 23% has controlled BP and 24% is not. Meantime in men, 51% were undiagnosed, 49% were diagnosed, 38% were treated (20% were uncontrolled and 18% were controlled) and 11% were not treated.

Meanwhile, in Indonesia there are 34.11% who suffer from HT with a population of 658,201 people and most HT of them do not carry out routine control or RCU as much as 41%. In South Sumatra, HT prevalence was 30.44% with a total of 20,231 people and most people do not carry out routine control as much as 53% (Riskesdas, 2018) According to the Central Statistics Agency of South Sumatra Province in 2019-2021, the type of disease that is widely suffered by the population of South Sumatra is HT with a figure of 283,390 people in 2019, were increase 645,104 people in 2020. Then in 2021, there were 987,295 people suffering from HT.

The longer a person has high blood pressure, the more difficult it is to control their blood pressure. The compliance of HT patients for blood pressure control in Indonesia is below 50% (Gama, 2014). A study by Darnindro (2017) shows that the prevalence of control non-compliance is still high at 63.8%. Rajasati et al. (2015) also found 67% HT control non-compliance. This can be influenced by several factors including the level of knowledge and family support ($p<0.001$). The behavior of people with high blood pressure can be influenced by knowledge and attitudes, when society lacks information, this causes the

person to be unable to behave well and usually his behavior is bad so that non-compliance with the routine treatment of high blood pressure disease because the patient does not have good knowledge and results in a person having a bad attitude to treat blood pressure. Setyowati et.al. (2017) found that there was a relationship between patients' attitudes towards HT and the prevention of HT recurrence (p=0.014) and patients who understand their condition are more likely to adopt preventive measures (Legido-Quigley *et al.*, 2015).

Blood pressure medication that usually involves the use of antihypertensive medications causes problems for many hypertensive patients in maintaining treatment. It is mostly caused by the side effects of the blood pressure medication you are taking. The results of the Trevisol study et.al. showed that hypertensive patients who received antihypertensive drugs (diuretics and ACE inhibitors are the most commonly used antihypertensive drugs) experienced a decrease in physical quality of life (male p=0.04 and female p=0.003) with physical functional measures of physical limitations, pain and generalization. In addition, the quality of life tends to decline when antihypertensive drugs are used more (Trevisol et al., 2012)

RCU is a problem that still receives attention in the handling and treatment of HT cases. Patient attitudes can influence the patient's routine control behavior to health services. However, in the search for published studies results in the last five years, the model of factors affecting the quality of life of hypertensive patients simultaneously is still lacking. Therefore, this study aims to modelling various factors that affect the quality of life of hypertensive patients.

METHODS

This study uses a cross-sectional approach to test the hypotheses to 89 participants included based on research criteria by filling a questionnaire and measuring the BP by sphygmomanometer as hypertension. Sample size of this study acquired with G*Power 3.1 (Faul et al., 2007a, 2007b, 2009) with parameters: effect size 0.15, critical value 5%, power 0.8, and 3 predictors. Attitude measured by Attitude in Hypertensive Patients (Koerniawan et al., 2019), while MA measured by MMAS-8 (Morisky et al., 2008) and QoL by SF-12 (World Health Organisation, 1997). All variables analyzed by Kendall's tau-b and chi-square in bivariate test, and SEM-PLS to test the model hypothesized. SEM-PLS is chosen to construct and propose new modelling in QoL of hypertensive patients. This study has been approved by DRCS UKMC.

RESULT AND DISCUSSION

Desciptive Analysis

Descriptive analysis of demographics, clinical characteristics, and main variables (Table 1) showed that the mean age of participants is 54.69 years indicating that the sample includes middle-aged individuals, with some variability in age. The sample consists of 19 men (21.35%) and 70 women (78.65%), indicating a predominance of female participants in the study. This gender distribution may be relevant when considering the generalizability of the findings. Participants have a mean duration of illness of 7.27 suggesting that most individuals have been living with hypertension for several years, which may influence their attitudes and management strategies. The average systolic blood pressure recorded (149.94 mmHg) and diastolic blood pressure (85.97 mmHg) which is above the normal range

also suggesting that many participants may not have optimal blood pressure control. Participants have a mean check-up interval of 12.44 months which may means that on average, individuals visit healthcare providers for monitoring their condition approximately once a year.

Table 1. Descriptive analysis result of hypertensive patient (n= 89)

Variables	mean ± SD
Age	54.69 ± 8.47
Duration of illness (DOI)	7.27 ± 5.38
Systolic blood pressure (BP)	149.94 ± 20.37
Diastolic blood pressure (BP)	85.97 ± 7.58
Check-up interval	12.44 ± 3.55
Attitude	36.25 ± 6.02
Quality of life (QoL)	75.62 ± 20.02
Physical compartement scale	9.79 ± 2.54
Mental compartement scale	13.26 ± 2.36
	f (%)
Gender	
Men	19 (21.35)
Women	70 (78.65)
Routine chek-up	
Adherent	41 (46.07)
Not adherent	48 (53.93)

The adherence to routine check-ups is nearly evenly split, with 41 participants (46.07%) being adherent and 48 participants (53.93%) not adherent. This highlights a potential area for intervention, as adherence to check-ups is crucial for effective hypertension management. Attitude towards HT average score (36.25) reflecting participants' general outlook towards managing their hypertension. The score suggests a moderate level of positive attitudes, but further analysis would be needed to determine its impact on health outcomes. And the average quality of life score is (75.62) indicating a relatively good quality of life among participants, but with significant variability, which may reflect differing experiences and challenges related to living with hypertension. In addition, the mean score for the physical and mental component as dimensions of quality of life suggesting that physical health may be a concern for this population, potentially affecting their overall well-being.

Preeliminary Analysis

Table 2. Correlation Analysis to each variable (n= 89)

Variables	τ	p-value
Attitude - Medication Adherence	0.5611	<0.001*
Medication Adherence - Blood Pressure	-0.4833	<0.001*
Blood Pressure - Quality of Life	-0.3199	<0.001*
Hypertensive duration - Quality of Life	-0.0847	0.2626
Age - Quality of Life	-0.0567	0.4448
	χ^2	**p-value**
Atiitude - Routine Check-ups	40.545	0.0063
Routine Check-ups - Blood Pressure	14.786	<0.001*
Routine Check-ups - Quality of Life	41.993	0.3846
Gender - Quality of Life	41.993	0.3846

**) included in constructing SEM-PLS modelling framework*

As a summary, the preliminary analysis indicates that there are significant relationships among the variables of interest, particularly the positive impact of attitude on medication adherence and the subsequent effects on blood pressure and quality of life. The SEM-PLS framework will allow for a

comprehensive exploration of these relationships, facilitating the understanding of direct and indirect pathways (Table 2).

SEM-PLS Modelling

SEM analysis processes in two steps which are measurement model and structural model analysis. In the measurement model all indicators on each variable has loading factor above 0.5, AVE below 0.9, Fornell- and good Larcker's and HTMT value, which indicates that the model has good validity. Also, Cronbach's alpha and composite reliability value above 0.8 showed it has good reliability. So, it can continue to assess structural model to test hypotheses.

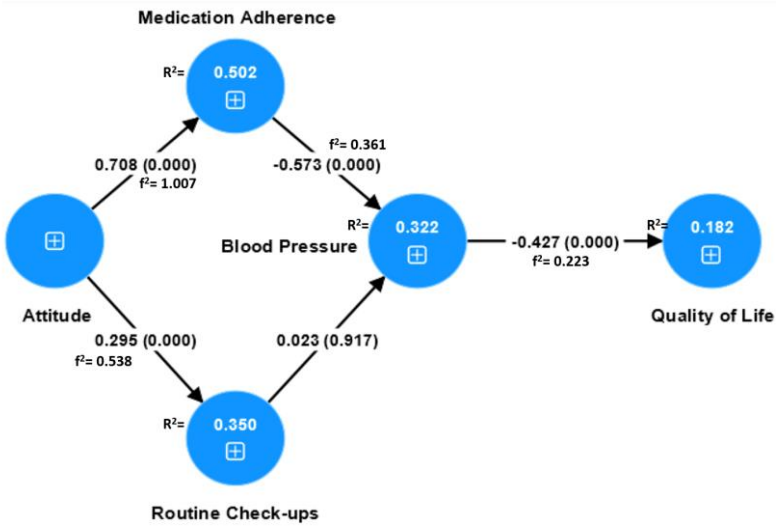

Figure 1. SEM-PLS Modelling Framework of QoL in Hypertensive Patient

The path coefficients indicate the strength and direction of the relationships between constructs. Significant paths include: Attitude to MA (β= 0.708, p<0.001), Attitude to RCU (β= 0.295, p<0.001), MA to BP (β= -0.573, p<0.001), and BP to QoL (β= -0.427, p<0.001). The R^2 values for the dependent variables indicate the proportion of variance explained by the independent variables. As in this study, the R^2 for Quality of Life suggests a moderate level of explanation by the model. In addition, the f^2 values indicate the effect size of the predictors on the outcome variables. Values above 0.35 indicate a large effect, while values between 0.15 and 0.35 indicate a medium effect. The results show varying effect sizes, with some predictors having a substantial impact on QoL.

The findings of this study contribute to the growing body of evidence that underscores the significance of patient attitudes and behaviors in hypertension management. The strong correlations between attitudes towards medication adherence, blood pressure control, and quality of life highlight the need for comprehensive strategies that not only address the clinical aspects of hypertension but also focus on enhancing patient engagement and education (Conversano et al., 2021; López, 2018). Future research should continue to explore these relationships, particularly in diverse populations, to develop tailored interventions that can effectively improve health outcomes in hypertensive patients.

This study also reveals significant indirect effects, such as: Attitude to BP mediating by MA (β= -0.406, p<0.001), MA to QoL mediating by BP (β= 0.245, p<0.001), and Attitude to QoL mediating by MA and BP (β= 0.173, p<0.001). These results suggest that improving medication adherence can lead to better blood pressure control, which in turn enhances the quality of life for hypertensive patients. This indirect effect may propose further research to explore and validate how those factors influence this modelling.

The study results provide valuable insights into the dynamics affecting the quality of life of hypertensive patients. The significant relationships identified in the model highlight the importance of patient attitudes and medication adherence in managing hypertension effectively. Role of attitude proves that the strong positive relationship between attitude and medication adherence suggests that fostering a positive attitude towards health management can significantly improve adherence to treatment regimens. This finding aligns with existing literature that emphasizes the psychological aspects of health behavior. Correlation between attitude and medical adherence also found in other studies (Pristianty, et.al, 2023; Oktayanti, et.al, 2024).

Impact of medication adherence also the negative relationship between medication adherence and blood pressure indicates that higher adherence is associated with better blood pressure control. Similar to the study conducted by Chia, et.al (2021) higher adherence can control blood pressure and reduce complications in patients. This reinforces the need for interventions aimed at improving adherence among hypertensive patients. Quality of life considerations shown in the negative relationship between blood pressure and quality of life underscores the detrimental effects of uncontrolled hypertension on patients' overall well-being. This finding emphasizes the necessity for regular monitoring and management of blood pressure to enhance the quality of life. Studies have shown that patients who actively engage in their hypertension management report improved QoL outcomes (Banda *et al.*, 2024). Healthcare providers play a critical role in facilitating this process. Regular follow-ups, patient education, and the use of technology for remote monitoring can enhance patient engagement and adherence to treatment plans (Whelton *et al.*, 2018).

The findings of this study construct the framework model of QoL in hypertensive patients which still need further exploration. While the study provides important insights into the factors affecting the quality of life of hypertensive patients, these limitations highlight the need for further research to validate and expand upon the findings. Future studies should consider longitudinal designs, larger and more diverse samples, and a broader range of influencing factors to enhance the understanding of this critical health issue.

CONCLUSION

Based on the findings, healthcare providers should prioritize educational interventions that enhance patient attitudes towards their health and encourage adherence to medication. Additionally, routine check-ups and personalized support can help address barriers to adherence, particularly for patients with busy lifestyles.
In conclusion, the SEM-PLS analysis effectively illustrates the interconnectedness of attitudes, medication adherence, blood pressure, and quality of life in hypertensive patients. The results advocate for a holistic approach to hypertension management that incorporates psychological, behavioral, and clinical strategies to improve patient outcomes.

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