Abstract

**Background/Objectives**: To investigate how and how much health literacy and self-efficacy can make an influence on treatment adherence of hypertensive elders. **Methods/Statistical Analysis**: Participants were those aged 65 or older who regularly visited one of five seniors welfare centers hosted by D metropolitan ward offices, were diagnosed with hypertension, and voluntarily agreed to participate in this study after. In total, the questionnaires of 190 respondents were selected for the final analysis. Hierarchical multiple regression analysis was conducted to identify the effect of participants’ health literacy and self-efficacy on treatment adherence. **Findings**: First, model that inputs as explanatory variables which were general characteristics of the participant: age, level of education, and gender variables and disease related characteristics: number of associated disease, duration of hypertension, level of stress were statistically significant, and explained 4.8% of treatment adherence. Stress and gender were predictor variables, and these variables were statistically related to treatment adherence. In the second step, when capability of oral health literacy and functional health literacy variables were put in the control condition of general characteristics and disease related characteristics, this model was statistically significant and explained 7.0% of treatment adherence. Predictor variables were stress, gender, and oral health literacy, and they were statistically related to treatment adherence. In the third step, when self-efficacy was put in the control condition of general characteristics and disease-related characteristics, this model was statistically significant and the explanatory power increased to 38%. Self-efficacy and level of education were shown as major predictor variables. **Application/Improvements**: To promote the treatment adherence of hypertensive elders, it is necessary to develop and apply programs for self-efficacy improvement.

**Keywords**: Hypertensive Elderly, Health Literacy, Self-efficacy, Treatment Adherence

1. Introduction

As a major risk factor of cardio-cerebrovascular diseases, the second or third cause of death in Korea, hypertension is a prominent medical concern and requires continuous management by those who are at-risk. Hypertension is a disease which requires continuous self-management, such as life-long medicine treatment and lifestyle improvement. Therefore, it is necessary to understand correctly the instructions for taking various medicines, for engaging in dietary treatments, and for processing health-related information. As health information includes terms and technical details that the reader is not familiar with, it is difficult for the elderly with chronic diseases to understand the meaning and content. When hypertensives have a lower ability to understand health information, they can have difficulties in acquiring appropriate information and communicating with medical providers, which may lead to unsuccessful health care. Therefore, recently, health literacy ability has been considered as a factor of successful health care for hypertensives and many chronic disease patients.

Additionally, it has been reported that for elders with chronic diseases, the higher their self-efficacy, the higher their medication adherence. Moreover, for elderly diabetics, it was self-efficacy that had the biggest influence on medication adherence. Thus, self-efficacy, the factor that changes life style in ways that affect blood pressure, is the main factor in treatment adherence and improving health consequences for patients with chronic disease. Also, a number of studies have shown that, self-efficacy has been found to be the most important factor in connecting knowledge and action.

*Author for correspondence*
Treatment adherence can be defined as carrying out actions which corresponds to clinical treatment of specific diseases\(^9\), which prevent injury from aggravation of symptoms and disease and help control patients’ current situations, making a positive influence on patients’ satisfaction of life\(^10\). In order to improve treatment adherence, influential factors related to health beliefs, health behaviors\(^11\), knowledge about high blood pressure\(^2,12\), health literacy ability\(^2\), and other facets of patient health have been frequently investigated.

Therefore, the purpose of this study is to investigate by what means and to what degree health literacy and self-efficacy can have an influence on the treatment adherence of hypertensive elders, and to provide empirical data to promote their treatment adherence.

2. Method

2.1 Participants

Participants were those aged 65 or older who regularly visited one of five seniors welfare centers hosted by D metropolitan ward offices, were diagnosed with hypertension, were under medication treatment of hypertension for more than one year, had no history of dementia or other mental diseases, and voluntarily agreed to participate in this study after understanding its purpose and methodology.

2.2 Research Tool

A research tool of this study was developed for hypertension patients, which consisted of a total of 54 questionnaires, 14 of which asked about general characteristics, 10 about health literacy, 10 about self-efficacy, and 20 about treatment adherence.

1. Health Literacy Ability

The tool for measuring of health literacy was revised from Tam Hieu Nguyen et al (2015) high blood pressure health literacy scale (Short version). Confidence in this study was Cronbach’s \(\alpha = .83\).

2. Self-Efficacy

For measuring self-efficacy, the tool developed by Park Young Im (1994) was used. The level of confidence about specific self-management behavior related to hypertension management had a range of a score of 10 to 100 when the average value of 10 questions was evaluated. Confidence in this study was Cronbach’s \(\alpha = .71\).

3. Treatment Adherence

The research tool for measuring treatment adherence, revised from the Min En Sil (2011) study, consisted of 20 questions with a 5-score Likert scale for responses. Higher scores signified better treatment adherence, and the questions were classified into 5 areas: 4 questions about accepting expert prescriptions, 3 questions about managing blood pressure and weight, 5 questions about dietary control, 2 questions about smoking and drinking, and 6 questions about exercising and managing stress. Confidence in this study was Cronbach’s \(\alpha = .84\).

2.3 Procedures and Data Collection

Data collection was conducted from Aug. 13, 2015 to Sept. 4, 2015. The researcher of this study visited senior welfare centers in person, explained the purpose and methodology of this study, achieved approval from the centers. Qualified participants were selected and taught how to fill out the questionnaire by a trained research assistant.

2.4 Data Analysis Method

In total, the questionnaires of 190 respondents were selected for the final analysis. General characteristics of participants were analyzed by frequency, percentage, mean value, and standard deviation. Also, for the analysis of the difference in health literacy, self-efficacy, and treatment adherence depending on general characteristics, t-tests and ANOVA were used. Finally, hierarchical multiple regression analysis was conducted to identify the effect of participants’ health literacy and self-efficacy on treatment adherence.

3. Results

3.1 General Characteristics

Of the participants, 101 people (53.2%) were aged between 75 and 84, with an average age of 79.10. The number of female participants was 99 (52.1%), and males numbered 91 (47.9%). The number of participants whose education level was “less than elementary school graduates” was 94 (49.5%). Regarding “household size”, 68 participants reported that they “live alone” (35.8%), 69 reported that they “live as a couple” (36.3%), the number of associated diseases averaged 1.07±1.02. “No smoking” was claimed by 177 (93.2%) respondents, and “no drinking” was claimed
by 154 (81.1%). 128 participants (67.4%) reported that they “work out regularly”. The duration of their hypertension diagnosis averaged 15.95 years, the duration of hypertension medication usage was 15.58 years, and the stress score averaged 3.23 out of 10 points.

3.2 Participants’ Health Literacy, Self-efficacy, and Treatment adherence

The average score of oral health literacy was 5.03 (possible range of 0 to 7), the functional health literacy score averaged 1.20 (possible range of 0 to 3), and the total score of health literacy was 6.23. Regarding self-efficacy, the average score was 81.55 (possible range of 36 to 100) with a total score of treatment adherence of 84.22 (Table 1).

3.3 Predictors of Treatment Adherence

First, model that inputs as explanatory variables which were general characteristics of the participant: age, level of education, and gender variables and disease related characteristics: number of associated disease, duration of hypertension, level of stress were statistically significant (F=2.598, p=.019), and explained 4.8% of treatment adherence. Stress (β=-.217, p=.003) and gender (β=.163, p=.047) were predictor variables, and these variables were statistically related to treatment adherence. In the second step, when capability of oral health literacy and functional health literacy variables were put in the control condition of general characteristics and disease-related characteristics, this model was statistically significant (F=2.783, p=.006) and explained 7.0% of treatment adherence. Predictor variables were stress (β=-.216, p=.003), gender (β=.191, p=.020), and oral health literacy (β=.191, p=.022), and they were statistically related to treatment adherence. In the third step, when self-efficacy was put in the control condition of general characteristics and disease-related characteristics, this model was statistically significant (F=14.282, p<.001) and the explanatory power increased to 38%. Self-efficacy (β=.609, p<.001) and level of education (β=-.159, p=.031) were shown as major predictor variables (Table 2).

| Table 1. The levels of Health literacy, Self-efficacy, and Treatment Adherence (N=190) |
|-----------------|-----------------|---------|-----------------|
| Variables       | Categories       | Range   | M±SD             |
| Health literacy | Oral HL          | 0~7     | 5.03±1.94        |
|                 | Functional HL    | 0~3     | 1.20±1.03        |
|                 | Total HL         | 0~10    | 6.23±2.60        |
| Self-efficacy   | Adherence to medical recommendation | 4~20 | 19.12±2.25 |
|                 | Blood pressure & Weight management | 3~15 | 10.25±2.79 |
|                 | Dietary management | 5~25 | 19.43±4.60 |
|                 | Smoking & Drinking management | 2~10 | 9.11±2.45 |
|                 | Exercise & Stress management | 8~30 | 26.31±3.74 |
|                 | Total            | 48~100  | 84.22±10.25 |

| Table 2. The Predictors of Treatment Adherence (N=190) |
|-----------------|-----------------|---------|-----------------|
| Variables       | adjusted R²     | β       | F/t             |
| Model 1         |                 |         |                 |
| Age             | 0.06            | 0.788   | 0.432           |
| Level of education | 0.083          | 0.961   | 0.338           |
| Gender(=male)   | 0.163           | 1.997   | 0.047           |
| Comorbidity     | -0.049          | -0.657  | 0.512           |
| Duration of HTN | -0.031          | -0.41   | 0.682           |
| Stress level    | -0.217          | -3.026  | 0.003           |
| Model 2         | 0.07            | 2.783   | 0.006           |
| Age             | 0.106           | 1.323   | 0.187           |
| Level of education | 0.05           | 0.575   | 0.566           |
| Gender(=male)   | 0.191           | 2.343   | 0.02            |
| Comorbidity     | -0.057          | -0.778  | 0.438           |

(Continued)
4. Discussion

The score range of oral health literacy was from 0 to 7, and the average score was 5.03, while the score range of functional health literacy was from 0 to 3, and the average score was 1.20. The total health literacy score was 6.23. Comparing with Kim Myo Sung’s advanced study, which had revised and complemented HBP-HLS (Full version), the level of oral health literacy was similar, but functional health literacy was lower.

Both investigations revealed statistically significant differences between all ages (F=14.51, p<.001) and levels of education (F=18.26, p<.001). In other words, the younger the age and the higher the level of education, the better the understanding of health literacy. The results were congruous with other research using different health literacy data.

Furthermore, this study has revealed an average self-efficacy score of 81.55 in a measurable range of 36 to 100, and the result was very similar to an advanced study targeting hypertensive elders. That investigation was an experimental study that measured the level of self-efficacy of hypertensives. Using the same tool, an advanced study targeting lower income elders with hypertension showed a score of 73.49.

The total average of the participants’ treatment adherence was 84.22, and it was comparatively higher than those of advanced studies, which valued 64.81\(^2\), 71.80\(^2\), and 65.41\(^1\). The reason why this study resulted in higher scores than advanced studies was the participants. This study’s participants, who used senior centers and walked by themselves, were more active in self-management than the advanced study participants, who were in hospital or who utilized registered public health nursing services. This is due to differences in lifestyle. Moreover, there was a correlation between self-efficacy and treatment adherence. Similarly to other advanced studies targeting the elderly with chronic illness, a study targeting hypertensives, an advanced study targeting kidney transplant patients, and one involving chronic arthritis patients, this investigation revealed that the higher the self-efficacy was, the better treatment adherence was. Therefore, self-efficacy is a significant variable that predicts treatment adherence.

Lastly, in this study, explainable factors of the treatment adherence of hypertensive elders were self-efficacy, gender, stress, oral health literacy, and level of education. Self-efficacy and level of education appeared to be key predictors in the final model, and the model indicates that these factors explained 38.7% of treatment adherence.

5. Conclusion

Therefore, to promote the treatment adherence of hypertensive elders, it is necessary to develop and apply programs for self-efficacy improvement.

6. References

1. Statistics Korea. ElderlyStatisticsSurvey [internet]. Available from: http://kostat.go.kr/portal/korea/kor_ko/5/2/index.board?bmode=read&aSeq=348646. Data accessed: 2014.
2. Kwon MS, Noh GY, Jang JH. A Study on Relationships between Health Literacy, Disease-related Knowledge and Compliance to Medical Recommendations in Patients with Hypertension. Journal of Korean Public Health Nursing. 2013; 27(1):190–202.

3. Kim JE. Measuring the Level of Health Literacy and Influence Factors: Targeting the Visitors of a University Hospital's Outpatient Clinic. Journal of Korean Clinical Nursing Research. 2011; 17(1):27–34.

4. Gordon MM, Hampson R, Capell HA, Madhok R. Illiteracy in Rheumatoid arthritis patients as determined by the Rapid Estimate of Adult Literacy in Medicine (REALM) scores. Rheumatology. 2002; 41(7):750–4.

5. Yang JR. The Effect of Health Literacy and Self-efficacy on Medication Adherence among the Elderly Patients with Chronic Disease. Unpublished Masters Thesis. Ewha Womans University. Seoul. 2014.

6. Song MS, Choi SY, Kim SA, Seo KS, Lee SJ, Kim EH. Development and Validation of the Diabetes Management Self-efficacy Scale for Older Adults(DMSES-O). The Journal of Muscle and Joint Health. 2014; 21(3):184–94.

7. Takaki J, Yano E. Possible Gender Differences in the Relationships of Self-efficacy and the Internal Locus of Control With Compliance in Hemodialysis Patients. Behavioral Medicine. 2006; 32(1):5–11.

8. Bandura A. Self-efficacy mechanism in human agency. American Psychologist. 1982; 37(1):122–47.

9. Haynes RB, Sackett DL, Gibson ES, Taylor DW, Hackett BC, Roberts RS, Johnson AL. Improvement of medication compliance in uncontrolled hypertension. Lancet. 1976; 1(7972):1265–8.

10. Kim MJ, Choi MH. Knowledge, Compliance and Quality of Life of Mothers of Children with Atopic Dermatitis. Journal of Korean Academy of Child Health Nursing. 2011; 17(4):272–80.

11. Park HS. The Effects of Compliance and Health Belief on Health Behavior in the Elderly with Hypertension. Unpublished Masters Thesis. Catholic University. Daegu. 2015; 4(6):922–7.

12. Min ES, Hur MH. Predictors of Compliance in Hypertensive Patients. Journal of Korean Academy of Fundamentals of Nursing. 2012; 19(4):474–82.

13. Lee TW, Kang SJ. Health Literacy in the Korean Elderly and Influencing Factors. Journal of the Korea Gerontological Society. 2008; 28(4):847–63.

14. Kim MS, Song MS. Effects of Self-management Program applying Dongsasub Training on Self-efficacy, Self-esteem, Self-management Behavior and Blood Pressure in Older Adults with Hypertension. Journal of Korean Academy of Nursing. 2015; 45(4):576–86.

15. Lee YO. Compliance with health behavior, self-efficacy and stroke risk level for low income hypertension patient enrolled in community health center. Unpublished master's thesis. Chungnam National University. Daejeon. 2005; 93(3):753–69.

16. Ryu KH, Son YJ. Impact of Cognitive Function and Self-efficacy on Medication Adherence of Elderly Patients with Chronic Disease. Journal of Korean Biological Nursing Science. 2013; 15(3):107–14.

17. Lee JL, Park HJ. A Study on Self-efficacy, Coping, and Compliance in Patients with Kidney Transplantation. The Journal of Korean Academy Society of Adult Nursing. 2015; 27(1):11–20.

18. Oh JH, Lim NY. A Study on the Relationships between Family Support, Self-efficacy, and Compliance in Chronic Arthritis. The Journal of Muscle and Joint Health. 2005; 12(1):28–38.