Impact of health literacy on medication adherence in older people with chronic diseases

Yun-Mi Lee, RN, PhD [a,1], Hye Yon Yu, RN, PhD [b,1], Mi-Ae You, RN, PhD [c], Youn-Jung Son, RN, PhD [d,*]

[a] Department of Nursing, Institute of Health Science, Inje University, Busan, Republic of Korea
[b] Department of Nursing, College of Medicine, Soonchunhyang University, Cheonan, Republic of Korea
[c] College of Nursing, Nursing Reserach Institute, Ajou University, Suwon, Republic of Korea
[d] Red Cross College of Nursing, Chung-Ang University, Seoul, Republic of Korea

Summary Medication adherence is a key factor of the therapy of chronic diseases in older people with chronic diseases. Inadequate health literacy results in poor health outcomes. Therefore, the aim of this study is to investigate the effect of health literacy on medication adherence to provide information for improving health outcomes in older people with chronic disease. This was a cross-sectional study of older people (people aged over 65 years) with chronic diseases in Korea taking one or more medications for 6 months and over from an academic referral medical center. Each patient completed a structured questionnaire by interview or self-report. Of the 291 older participants, 30.6% had high medication adherence. In hierarchical multiple regression analysis, health literacy was the strongest predictor of medication adherence ($\beta = 0.190$, $P = 0.001$). In addition, perceived health status, use of magnifying glass, and assistance with medication administration were also significant factors related to medication adherence. In conclusion, enhancing health literacy may improve medication adherence of older people with chronic disease. The development, implementation and evaluation of health literacy interventions for older people with chronic conditions are important to increase medication adherence and potentially improve patient outcomes. Such programs would also raise awareness of the impact of health literacy on patient outcomes. Furthermore, this could contribute to reducing health inequalities worldwide.
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* Corresponding author at: Red Cross College of Nursing, Chung-Ang University, 84 Heukseok-Ro, Dongjak-Gu, Seoul, Republic of Korea. Tel.: +82 2 820 5198.
 E-mail address: yjson@cau.ac.kr (Y.-J. Son).
[1] The first two authors are equal first authors.

1. Introduction

The growth of populations at age 65 or older may bring about increased prevalence of chronic diseases (Mager & Madigan, 2010). Managing older people with chronic diseases and preventing worsening requires detailed attention to self-management, including taking multiple prescribed medications for comorbidity (Hubbard, O'Mahony, & Woodhouse, 2013; Westerbotn, Fahlström, Fastbom, Agüero-Torres, & Hillerås, 2008). Previous studies have reported that medication adherence is associated with poor outcomes including mortality, hospitalization, and healthcare costs in patients with chronic diseases (Benjamin, 2012; Osterberg & Blaschke, 2005; Westerbotn et al., 2008). Despite evidence of the importance of medication adherence in helping older patients maintain their health status and quality of life, great variation in adherence to medications has been reported, with studies often indicating poor or below average levels of adherence (DiMatteo, 2004; Fitzgerald et al., 2011). Previously, numerous studies have reported on medication adherence, and many factors have been hypothesized to influence adherence, including patient health status, disease, and medication knowledge, patient—nurse communication, and financial difficulty (DiMatteo, 2004; Fitzgerald et al., 2011; Shehadeh-Sheeny, Eilat-Tsanani, Bishara, & Baron-Epel, 2013; Zhang, Terry, & McHorney, 2014).

Health literacy has received increased attention as an important factor in health outcomes. Health literacy is an individual's ability to obtain and understand basic health information and services needed to make appropriate decisions regarding their health (Bauer et al., 2013). Health literacy is affected by functional health status (Federman, Sano, Wolf, Siu, & Halm, 2009; Wolf, Gazmararian, & Baker, 2005), and health literacy level of older people will be affected by lower health status. The percentage of adults in the 65 and older age group with inadequate and basic levels of health literacy was 29% and 30%, respectively (Lindquist et al., 2012). Nevertheless, only a small body of literature links low health literacy to poorer medication adherence (Kobayashi, Wardle, & von Wagner, 2014), and a previous study indicated a controversial association between health literacy and overall medication adherence (Zhang et al., 2014). There is still more limited information about impact of health literacy on medication adherence in Korean older people with chronic diseases. Hence, there is a clear need for further studies that examine the aspects of medication non-adherence that are most associated with health literacy. Therefore, the purpose of this study was to examine the impact of health literacy on self-reported medication adherence in Korean older people with chronic diseases.

2. Methods

2.1. Design and sample

This study was cross-sectional. Data were collected with a structured questionnaire by face to face interview or self-report and review the medical records. It took 10—15 min to complete the questionnaire. This study invited participants from older outpatients and inpatients of hospital at a university hospital of 800 beds in a city in South Korea using the convenience sampling method. Participants were recruited from the following inclusion criteria: individuals (a) were older than 65 years of age; (b) were taking at least one medication by doctor's prescription for more than 6 months for chronic diseases including cardiovascular disease, gastrointestinal diseases such as hepatitis, pancreatitis, cholangitis, liver cirrhosis, gastric cancer, etc., and diabetes mellitus (DM); (c) were able to read and write; (d) had no history of drug abuse or addiction; and (e) participated voluntarily. Illiterate, non-Korean-speaking, too ill or cognitively impaired patients to participate as determined by researchers through interaction or chart documentation were excluded, and the convenience sample of the sequential patients meeting the eligibility criteria were asked to provide consent.

The sample size was calculated by G* power version 3.1.2 program (Institute for Experimental Psychology of Heinrich-Heine University, Dusseldorf, Germany). A power analysis for linear multiple regressions was conducted using an alpha of 0.05, power of 0.95, and a medium effect size of 0.50. The required sample size was more than 252 patients. The researchers and research assistants had been trained on the survey method and had discussions for consistent measurement before visiting the study hospital.

2.2. Ethics

Ethical approval to conduct the study was obtained from the local institutional review board of Soonchunhyang University (Cheonan, Korea). After giving explanation about the study aims, data collection method, and confidentiality of participants, written consent was obtained from patients who had agreed to participation in this study. All procedures were performed in accordance with the World Medical Association Declaration of Helsinki (2008).

2.3. Instruments

2.3.1. Sociodemographic, health- and medication-related characteristics of participants

Participants were required to provide sociodemographic characteristics, including sex, age, spouse, education level, job, and monthly income. Further, participants were required to provide health- and medication-related individual characteristics, including perceived health status, activities of daily living, use of magnifying glass, use of hearing aids, disease, reading and writing ability, number of medications, daily pill count, assistance with medication administration, and side effects of medication. All characteristics were measured using a structured questionnaire by self-report or interview.

2.3.2. Medication knowledge

A medication knowledge scale developed by Burge et al. (2005) was used to measure medication knowledge in this study. This scale consists of 5 items that were translated from English and back-translated into Korean after approval for using this instrument from the author. Respondents were asked how well they knew the names, purposes, recommended doses, frequencies, and side effects of their