Applied Nursing Research 31 (2016) 94–99

Contents lists available at ScienceDirect

Applied Nursing Research

journal homepage: www.elsevier.com/locate/apnr

A cross-sectional survey of medication adherence and associated factors for rural patients with hypertension

Chunhua Ma, Ph.D. *

School of Nursing, Guangzhou Medical University, Guangzhou City, Guangdong Province, 510180, China

ARTICLE INFO

Article history:
Received 7 October 2015
Revised 20 December 2015
Accepted 14 January 2016

Keywords:
China
Hypertension
Medication adherence
Rural patients

ABSTRACT

Aim: The objectives of this study were to describe the medication adherence of Chinese rural patients with hypertension and to investigate the factors associated with medication adherence.
Background: Medication adherence and associated factors for patients with hypertension have been widely explored in previous studies; however, these studies mainly focused on hypertensive patients in urban areas. More information regarding prevalence and the correlated factors for medication adherence for rural patients with hypertension is needed to better control blood pressure and prevent hypertension-related complications.
Methods: The study was carried out in three township hospitals in Shanxi Province (Northern China). A cross-sectional design was adopted to facilitate the survey of rural patients with hypertension. The sample consisted of 1159 participants from three township hospitals. Demographic and clinical characteristic variables, medication adherence and social support were investigated. Multivariate logistic regression was used to test the determinants of adherence.
Results: The results demonstrated that 21.3% of patients were adherents to medication and that 78.7% of patients were non-adherents. Most of the participants (71.4%) took medication more than three times daily; only 18.2% of patients took one antihypertensive tablet at a time. Multivariate logistic regression showed that the following variables were associated with medication adherence: age, household income, duration of diagnosis, number of antihypertensive tablets taken in each dose, daily frequency of taking medication, and social support.
Conclusion: The medication adherence of Chinese rural patients with hypertension is suboptimal. Close attention and effective strategies targeting these patients are necessary; healthcare programs should be designed according to the factors affecting medication adherence.

1. Introduction

The incidence of hypertension is on the rise in developed and developing countries. There are more than 200 million hypertensive patients in China; the estimated prevalence of hypertension is 38.6% in urban areas and 43.0% in rural areas (Liu, 2011; Zhao, Sun, & Wang, 2013). Uncontrolled blood pressure (BP) is a major risk factor for other diseases, such as coronary heart disease, cerebral thrombosis, stroke and chronic renal failure (Al-Ramahi, 2015; Liu, 2011).

Lack of adherence to hypertension medications is a major reason for uncontrolled BP. Patients with hypertension may fail to take their medication as prescribed because of the chronic nature of the disease and the lack of obvious symptoms (Bramley, Gerbino, Nightengale, & Frech-Tamas, 2006; Moreira et al., 2009; Vinker et al., 2008). Non-adherence to treatment is a worldwide problem in chronic disease therapy. According to the results of previous studies, adherence to long-term therapy for chronic diseases is 50%, on average, in developed countries; the adherence rate is even lower in developing countries (Al-Ramahi, 2015; Liang, 2011). Lower adherence to antihypertensive medications has also been observed among Chinese urban and rural patients with hypertension, with over half of them not achieving BP control, thus succumbing to other diseases and a diminished quality of life (Diao, Liu, & Yu, 2010; Liang, 2011; Ma et al., 2012). Moreover, inadequate medication adherence also could lead to increase health care utilization and consumption of medical resources.

Factors that affect adherence behavior are complex and diverse. In the past two decades, many studies have been conducted, obtaining a variety of results regarding the predictors of treatment adherence for hypertension. Among these well-documented socio-demographic predictors of adherence, variables such as age, gender, income, education level are reported (Alhalaiqa, Deane, Nawafleh, Clark, & Gray, 2012; Krousel-Wood et al., 2009; Morisky, Ang, Krousel-Wood, & Ward, 2008; Wang, Lau, Loo, Chow, & Thompson, 2014). Other factors, including clinical and psychosocial characteristics, that are also reported to positively impact adherence to prescribed therapies include the complexity of treatment regimens, side effects of medications, forgetfulness, social support, quality of the relationship between the patient and the physician (Alhalaiqa et al., 2012; Cott, Gignac, & Badley, 1999; Gadkari & McHorney, 2012; Iskedjian et al., 2002; Ramli, Ahmad, & Paraidathathu,

* 195 Dongfeng Rd., Guangzhou, China, 510180. Tel.: +86 020 8134 0031.
E-mail address: mawinter@126.com.

http://dx.doi.org/10.1016/j.apnr.2016.01.004
0897-1897/

2012). However, these studies mainly focus on hypertensive patients in urban areas; rural hypertensive patients are ignored.

Studies related to the medication adherence of rural hypertensive patients are also very limited in China. The extant research does not provide enough evidence about the status quo of the medication adherence of rural residents because they present several methodological limitations, such as small sample sizes, non-validated scale use, and crude statistical analyses. Compared with urban hypertensive patients who are considered in studies, adherence to medication for rural patients has long been given minor attention, although it impacts every aspect of rural medical care (Hyre, Krousel-Wood, Muntner, Kawasaki, & DeSalvo, 2007; Liang, 2011). Earlier studies showed that the first two reasons for mortality are cardiovascular and cerebrovascular diseases in rural China, mostly resulting from hypertension complications (Diao et al., 2010; Zhao et al., 2013). Their findings reveal that Chinese rural patients suffer from poverty, poor quality of life, and malnutrition because of the effect of chronic diseases or their related complications (Chen & Jin, 2012; Diao et al., 2010; Ling, Liu, Lu, & Wang, 2011). For this reason, the study is designed and conducted to remind the Chinese government and Chinese healthcare professionals to provide additional healthcare, as well as pay close attention, to patients in rural populations.

2. Methods

2.1. Objectives

The objectives of the study were to describe medication adherence and identify the extent to which demographic, clinical and psychosocial determinants predict medication adherence.

2.2. Design

A cross-sectional design was adopted to facilitate the survey regarding treatment adherence and its associated factors of patients with hypertension in rural areas of northern China. The study used a convenience sampling method to recruit participants with hypertension. The data were collected using self-report questionnaires.

2.3. Setting and participants

Participants were enlisted from the medical outpatient department of three rural township hospitals in Jinzhong City of Shanxi Province, China. They were invited to take part in the study if they met the following inclusion criteria. The inclusion criteria were: (1) patients who were older than 18 years old and who agreed to attend the study, (2) patients who were diagnosed with essential hypertension by a cardiovascular physician, (3) patients who took antihypertensive medications for therapy, and (4) patients who were farmers and lived in rural areas. The exclusion criteria were: (1) secondary hypertensive patients, (2) patients with severe mental disorders, and (3) pregnant women.

2.4. Procedure

The study was approved by the Ethics Committee of Guangzhou Medical University. The data were collected from the medical outpatient departments in three rural township hospitals by three registered nurses, who served as research assistants. They were given 6–8 hours of training. The training focused on the aim of the study, instruments used, and data collection method. A pilot study was conducted to help the research assistants learn how to collect patients' information before the main study. Each nurse was asked to collect ten questionnaires; these questionnaires were only used to practice data collection, not as the final data of the main study.

Patients came to the medical outpatient department of three rural township hospitals; they were identified and invited to join the study by the three research assistants. Patients who met the aforementioned inclusion criteria signed informed consent to participate in the study and allow access to their medical records. The research assistant explained the goal of this study to the patients and gave the standardized instructions prior to the patient completing the questionnaire. Participants were asked to complete a series of self-report questionnaires that included standardized instruments to measure general characteristics, medication adherence, and social support. Participants were provided with a private room to complete forms to maintain confidentiality. They placed completed questionnaires into a box that was in a convenient place for survey responses to be deposited. The research assistant was also available to answer questions and clarify any issues as the participants filled out the questionnaires. Patients received one tube of toothpaste ($1.59) as a token of gratitude for completing the survey.

2.5. Instruments

A set of questionnaires was administered to obtain socio-demographic and clinical information. Regarding the socio-demographic demographic data, we included age, gender, educational level, marital status, income and health insurance information. The clinical characteristic data included the duration of diagnosis, symptoms and complications related to hypertension, other chronic diseases, antihypertensive drug types, side effects, number of antihypertensive tablets in each dose and daily frequency of taking medication.

Medication adherence was tested using the Morisky medication adherence scale (MMAS) (Morisky, Green, & Levine, 1986). This simple 4-question survey assessed the likelihood that patients took their drugs as prescribed, and the MMAS had been translated, validated and previously used in China. The sensitivity of the MMAS in medical populations was 0.81, and the specificity was 0.44. Cronbach's α ranged from 0.61 to 0.90 (Tzeng, Chang, Chang, & Lin, 2008). Cronbach's α was 0.82 in this study. Patients were considered to be adherents when they answered “no” to four questions in the survey; answering “yes” to three or fewer questions classified them as non-adherents (Ledur et al., 2013).

Social support was measured by the social support rating scale (SSRS) (Xiao, 1994). It consisted of 10 items that assessed three types of social support. Each item asked the respondent to indicate the degree of obtaining support from family members, relatives, friends and organizations. The scores of ten items were summed to show each individual response. The higher the score, the more social support is available for the participant. The scale has been widely used in China and Japan, with an internal consistency ranging from 0.89 to 0.94 and a test–retest reliability of 0.92. Cronbach's α was 0.91 in the present study. The cutoff value was 30, which was used to distinguish higher social support from lower social support based on previous studies (Xiao, 1994).

2.6. Data analysis

Statistical analyses were performed with SPSS version 19.0 (SPSS, Chicago, Illinois, USA). The distribution plots for each variable were examined. The assumption of normality was evaluated; variables that did not meet the assumptions of normality were transformed by using a logarithmical transformation. The means and standard deviations were computed for continuous data. Frequencies and percentages were calculated for categorical variables. In univariate analyses, *t*-tests and chi-square tests were used to compare the characteristics of adherents and non-adherents. Multivariate logistic regression analysis was adopted to evaluate the odds ratios of the predictors that showed a statistically significant correlation with medication adherence in univariate analysis. A *p*-value less than 0.05 was considered to have a significant difference.