HOSTED BY

ELSEVIER

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: http://www.elsevier.com/journals/international-journal-of-nursing-sciences/2352-0132

Original Article

Self-reported diabetes treatment among Chinese middle-aged and older adults with diabetes: Comparison of urban residents, migrants in urban settings, and rural residents

Hanzhang Xu [a,d], *Jianfeng Luo* [b], *Bei Wu* [a,c,d,*]

[a] *Duke University School of Nursing, Durham, NC 27710, USA*
[b] *Department of Health Statistics and Social Medicine, School of Public Health, Fudan University, Shanghai, China*
[c] *Duke University Center for the Study of Aging and Human Development, Durham, NC 27710, USA*
[d] *Duke Global Health Institute, Durham, NC 27710, USA*

ARTICLE INFO

Article history:
Received 26 June 2014
Received in revised form
26 January 2015
Accepted 28 January 2015
Available online 18 February 2015

ABSTRACT

Purpose: To compare self-reported diabetes treatments among Chinese urban residents, rural migrants in urban settings, and rural residents.
Methods: Data from 993 diabetics at least 45 years of age were collected from the China Health and Retirement Longitudinal Study conducted in 2011. Multiple logistic regressions were performed to examine the associations between individual characteristics and diabetes treatments.
Results: In total, 719/993 (72.4%) of the respondents received treatment for diabetes; of which < 8% used insulin therapy. Urban residents were more likely than rural residents to use insulin therapy [odds ratio (OR) = 0.44, confidence interval (CI): 0.20–0.99; $p < 0.05$], and more likely to use traditional Chinese medicine than migrants (OR = 0.30, CI: 0.10–0.96; $p < 0.05$). Overall, rural residents showed lower treatment rates than urban and migrant populations.
Conclusion: Efforts to improve and enhance diabetes treatments, particularly among rural residents, are urgently needed in China.

1. Introduction

Diabetes is becoming a global epidemic, for which China has the highest number of cases [1]. Indeed, the prevalence of diabetes among the adult population has dramatically increased in the past three decades, from <1% in 1980 to 11.6% in 2010, which corresponds to an estimated 113.9 million adults in China with diabetes [2,3]. Moreover, this

* *Corresponding author.*
E-mail addresses: hanzhang.xu@duke.edu (H. Xu), jfluo@shmu.edu.cn (J. Luo), bei.wu@duke.edu (B. Wu).
Peer review under responsibility of Chinese Nursing Association.
http://dx.doi.org/10.1016/j.ijnss.2015.01.005

prevalence increases with age, affecting up to 23.5% of those 70 years of age and older [1]. Diabetes is a chronic disease that is a major risk factor for morbidity and mortality, leading to complications affecting the heart, blood vessels, eyes, kidneys, and nerves [4,5]. However, effective treatment can lower blood glucose and other factors that damage blood vessels, thereby lowering the risk of diabetes complications [6–9]. The American Diabetes Association recommends individualizing treatment strategies to control blood glucose values and prevent diabetes-related complications [10].

Economic development and healthcare systems can vary between rural and urban areas in China [11–13], thus creating divergent knowledge and implementation of diabetes treatment among various regions. Previous studies have reported on treatment rates among patients in different residential settings, such as between urban and rural settings, or costal and interior provinces [1,12,14–17]. Although some studies showed no difference in diabetes treatment rates between rural and urban residents, others reported significantly higher treatment rates in urban dwellers compared to their rural counterparts [15,16]. Thus, further studies using a nationally representative sample are needed to address the discrepancy.

Rapid urbanization in China has contributed to a massive population influx to large cities, evidenced by a migrant population of 221 million in 2010, among which 72% were rural-to-urban migrants [18]. These migrants typically have a low socioeconomic status, are isolated with limited family or social support, and have long hours in poor working conditions, all which can affect their health and limit their access to healthcare [19–21]. Previous studies on the health of this migrant population have primarily been focused on occupational diseases and injuries [22–25]. To our knowledge, no studies have explicitly focused on the treatment of chronic diseases, such as diabetes, in the migrant population in China. Therefore, the aim of this study was to examine the prevalence and types of diabetes treatments among urban, rural, and urban migrant Chinese adults. The Andersen behavioural model of health care utilization was used as the rationale to select key variables [26–28], which were assessed in respondents of the 2011 China Health and Retirement Longitudinal Study (CHARLS), comprising a nationally representative sample with community- and individual-level data [29,30].

2. Methods

2.1. Data source

The CHARLS dataset contains health, financial, and family data of 17,708 Chinese residents 45 years of age and older from 10,287 households in 28 of China's 30 provinces (excluding Tibet and Hainan Province) [30]. The study used a questionnaire to collect data concerning demographics, family structure/transfer, health status and functioning, biomarkers, healthcare and insurance, work, retirement and pension, income and consumption, and assets (individual and household). The present study is comprised of data from 993 respondents who reported being diagnosed with diabetes by a health professional.

2.2. Outcome measures

Two diabetes treatment variables were used as the study outcomes: diabetes treatment (yes/no) and type (reported as traditional Chinese medicine, Western modern medicine–pharmaceutical management of diabetes, insulin injections, or a combination of these on the questionnaire).

2.3. Environmental measures

Respondents were categorized according to place of residency: urban residents, those living in an urban area with urban medical insurance; migrant population, those living in an urban area but have rural medical insurance (e.g., New Cooperative Medical Insurance); and rural residents, those living in a rural area with rural medical insurance.

2.4. Respondent characteristics

Respondent demographics that were analysed include age, gender, marital status, education (illiterate, primary education only, secondary education but no higher, or college level and above), and household income (low: $\leq$5700; middle: 5700–27700; or high: $\geq$27700 Yuan).

2.5. Statistical analysis

STATA 13 (StataCorp LP, College Park, TX, USA) and SAS Version 9.3 (SAS Institute Inc., Cary, NC, USA) statistical software were used for data analyses. Analyses of variance, *t*-test, and χ^2 analyses were used to compare mean differences and frequency distributions among the three residency categories. Logistic models were used to examine the outcome measure of diabetes treatment, and multinomial logistic regression models were applied to compare among the types of diabetes treatments. Considering the sampling strategy applied in the 2011 CHARLS study [29,30], we used survey weight in all data analyses. Results are presented as percentage or odds ratio (OR) and 95% confidence interval (CI); $p < 0.05$ was considered as significant.

3. Results

3.1. Respondent characteristics

Characteristics of the 993 respondents included in this study are presented in Table 1. The average age of respondents from urban areas was significantly older compared with rural residents and the migrant population ($p = 0.007$). Education status also significantly differed among the residency locations ($p < 0.001$), with urban respondents reporting higher education levels than the other two groups. Furthermore, there was a significant difference regarding income ($p = 0.003$); there was a higher proportion of urban residents in the low-income category compared with rural residents and the migrant population.