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Research report

Association of empty nest with depressive symptom in a Chinese elderly population: A cross-sectional study

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ABSTRACT

Background: Empty nest has been becoming the main family pattern among old people, and influencing the traditional family providing for the aged in China. This study aimed to investigate the association of empty nest with depressive symptom in a Chinese elderly population.
Methods: Our study was based on the baseline investigation of Zhejiang Major Public Health Surveillance which was conducted in 2014. The final analyzed sample consisted of 9215 participants aged no less than 60 years. Subjects completed a questionnaire including demographic characteristics, living arrangements, behavioral risk factors, health status, subjective assessments, and Patient Health Questionnaire-9 scale.
Results: More than half of the participants were empty nest elders (57.4%). The overall prevalence of depressive symptom was 10.3%, while it was higher in empty nest group than in non-empty nest group (11.6% vs. 8.6%, $P < 0.001$). A positive association was found between empty nest and depressive symptom, the OR (95%CI) was 1.223(1.045, 1.431). After stratified by gender/age/education level/employment status, this association was just prominent in participants of male, 70 years old and above, primary school education, and retirees. No matter living with spouse or living alone, empty nesters were more likely to have depressive symptoms than non-empty nesters.
Limitations: Cross-sectional study could not make a causation conclusion. The social supports of participants were not been investigated in detail.
Conclusions: Empty nest elders, especially those who are male, 70 years old and above, primary school education, and retired, are more vulnerable to depressive symptom.

1. Introduction

When children departed from home to live independently, old parents are left in empty nests, in which there is only an elderly couple or one old person. With the declining of fertility rate, more frequent population flow, and the trend of young people to live independently after marriage, the number of empty nest elders is increasing rapidly (Wang et al., 2013). Between 1880 and 2000, the proportion of married men aged 60 and older living in an empty nest more than quadrupled in the United States, rising from 19% to 78% (Gratton and Gutmann, 2010). In 2003, the empty nest families accounted for almost 25% of elder households in China. It is estimated that this proportion will research 90% by 2030 (Xie et al., 2010). Empty nest has been becoming the main family pattern in old people.

Depression is one of the most frequent mental health problems during old age (Lepine and Bouchez, 1998; Smith, 2014; Stoppe, 2008). The International Consortium of Psychiatric Epidemiology (ICPE) interviewed 37000 adults in 10 countries (North America, Latin America, Europe and Asia) and found the lifetime prevalence of depression for adults varied from 3% in Japan to 16.9% in USA (Andrade et al., 2003; Reddy, 2012). Due to the large number of patients and long duration of disease, depression responsible for more years lost to disability (YLD) than any other condition. When ranked by disability and death combined, depression comes ninth behind prolific killers such as heart disease, stroke and HIV (Smith, 2014). In 2010, the YLDs from depressive disorders in 65 and above age group were 6.1 million (Ferrari et al., 2013). Moreover, it is believed that currently, depression is still widely undiagnosed and

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untreated because of stigma, lack of effective therapies and inadequate mental-health resources (Smith, 2014).

Previous studies showed that empty nest elders were more likely to report loneness (Liu and Guo, 2007), anxiety disorder (Wang et al., 2013), low health-related quality of life (Liu and Guo, 2007), and poor social relationship (Wu et al., 2010), all of which were positively associated with depression. Thus, we assume that empty nest elders might be more vulnerable to depressive symptom. Considering the different psychological features according to gender, age, education level, and employment status, we further explore the association of empty nest with depressive symptom after controlled for these factors.

2. Methods

2.1. Ethics statement

This study was based on the baseline investigation of Zhejiang Major Public Health Surveillance Program (ZPHS), an ongoing population-based cohort study which is focused on the health condition of aging population. The study protocol was approved by the Ethics Committee of Zhejiang Provincial Center for Disease Control and Prevention. Written informed consent was obtained from each participant before data collection.

2.2. Subjects

All the participants were enrolled in Zhejiang province. Multistage sampling was implemented according to the following steps. Firstly, 6 of the 90 counties (including county-level city and district) in Zhejiang province were randomly selected. And then, one town in each county and several communities in each town were randomly selected in turn. Finally, all permanent residents aged no less than 60 years in selected communities were included in our study. For each county, no less than 1500 participants were investigated. After excluding those who 1) were childless ($n=163$), 2) only living with others who are neither their children nor spouse ($n=124$), 3) were absence of answers in three or more items in the questions related to depressive symptoms ($n=21$), finally, a total of 9215 participants were included in analysis.

2.3. Data collection

A face-to-face interview was performed by trained professionals for each participant using a self-developed questionnaire. Demographic characteristics (gender, age, ethnicity, education, marital status, employment status and annual personal income), living arrangements, behavioral risk factors (smoking, alcohol consumption, and physical activity), health status (adverse health events in the last year, reported number of diseases, activities of daily life, cognitive function), subjective assessments (whether health influence life, self-perceived health and self-perceived income level), and depressive symptom were collected.

2.4. Variable assignment

Empty nest was measured by the following questions: (1) how many people were there in your house living together with you in the past year? If the answer was not zero, then ask, (2) who are they, spouse, children, or others? Elders who lived alone or with spouse only were defined as empty nest elders, while those who lived with children were defined as non-empty elders. Patient Health Questionnaire-9 scale (PHQ-9) was used to evaluate the depressive symptoms. This scale has nine items by asking “Over the last 2 weeks, how often have you been bothered by any of the following problems”. Each item is scored 0–3 to the response categories of not at all, several days, more than half the days and nearly every day, respectively. PHQ-9 total score for the nine items ranges from 0 to 27 (Spitzer et al., 1999). A score of 5–9 indicates depressive symptoms which are mild and warrant watchful waiting, a score of 10–14 indicates clinically relevant moderate depression which warrant initiation of counseling and/or medication, and a score of 15 and above indicates moderately severe symptoms requiring medication (Wong et al., 2014). In Chinese population, the sensitivity was 0.86 and the specificity was 0.85 when cut point was 9, and the sensitivity increased as cut point decreased. (Chen et al., 2010). In our study, score of 5 represents cut point for depressive symptom.

Adverse health events included hospitalization and falls. The number of chronic diseases was determined by formally diagnosis of the following 16 common illnesses: hypertension, hyperlipidemia, diabetes, coronary heart disease, emphysema, phthisis, asthma, chronic bronchitis, cholelithiasis, chronic hepatitis, nephritis, cancer, Parkinson's disease, arthritis, cataract and glaucoma. Activities of daily life were determined by the Activities of Daily Living Scale (ADL) in the Chinese National Basic Public Health Service Specification, which consisted of self-feeding, bathing, dressing, toilet hygiene and functional mobility. The total score is 37, and a score between 0 and 3 is identified as independent (China, 2011). Cognitive function was determined by the Mini-Mental State Examination (MMSE), which includes 30-items. The total score is 30, and a score above 17 for illiteracy, above 20 for people with 0–6 years of education, above 24 for people with more than 6 years education is identified as cognitive impairment, respectively (Wang, 2005).

2.5. Statistical analysis

All data were shown as number (percentage) and compared by chi-square test between empty nest and non-empty nest. Binary logistic regression was used to evaluate the association of empty nest with depressive symptom. Odds ratios (ORs), 95% confidence intervals (95% CIs) and corresponding P values for risk of depressive symptom were calculated. Covariates in logistic regressions were chosen from the variables which were statistically associated with empty nest in this study or clinically associated with depression as revealed in previous studies. Different groups of covariates were adjusted in different models. Stratification analysis was further done after stratified by gender, age, education level, and employment status. All tests were two-sided and $P<0.05$ was considered statistically significant. Statistical analyses were performed by SAS version 9.1 for Windows (SAS Institute Inc., NC, USA).

3. Results

3.1. General characteristics of study population

A total of 9215 participants were recruited in our analysis. The median age was 68.0 years old. Among these participants, 52.0% were female and majorities were Han ethnicity (96.1%). About half of participants were illiterate (50.6%), and about three quarters were currently married (76.1%). More than half of the participants were retired (54.6%) and had an average annual personal income of less than 10,000 Yuan (55.1%).

A percentage of 57.4% were empty nest elders (5289/9215). Compared with non-empty nest group, empty nest group had higher proportions in older age, Han ethnicity, higher education level, married, retired, and lower income. The prevalence of depressive symptom was 10.3% in all participants, while it was