

Investigating Health Status Among Women Aged 50-70 years old in Hunan Province, China: A Cross-Sectional study

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Abstract

Background: As promotion of the Global strategy and action plan on ageing and health 2016-2020 and the Outline of the "Healthy China 2030" Plan, healthy ageing becomes a hot pot. It is crucial to identify health status of senior women and acquire characteristics of them. The purpose of this paper was to investigate the health of women aged 50-70 in Hunan Province of China, come out coping strategy and prompt an active discussion for healthy ageing.

Methods: A cross-sectional study was conducted in 20 communities randomly selected from 5 sampled districts and 5 counties in Hunan Province. A self-designed and structured questionnaire was used, included demographic data, diseases-related information, self-reported health, health behaviors, and psychological health. The data was collected by well-trained workers, double-entered into EpiData 3.0 and analyzed by SPSS 19.0.

Results: Among the 2585 senior women, 51.0% was chronic diseases, 49.6% was gynecopathy and 23.6% was mastopathy. Age [OR=1.394, 95% CI=(1.63-1.670)], household type [OR=1.700, 95% CI=(1.416-2.042)], BMI [OR=1.194, 95% CI=(1.043-1.367)], average monthly household income [OR=0.884, 95% CI=(0.809-0.965)] and self-reported physical health [OR=4.659, 95% CI=(3.913-5.546)] were significantly associated with chronic diseases. Age [OR=0.668, 95% CI=(0.564-0.792)], household type [OR=1.335, 95% CI=(1.094-1.629)], occupation [OR=1.045, 95% CI=(1.002-1.090)], average monthly household income [OR=1.243, 95% CI=(1.143-1.352)] and self-reported physical health [OR=1.748, 95% CI=(1.510-2.024)] were significantly associated with gynecopathy. Age [OR=0.749, 95% CI=(0.616-0.910)], household type [OR=1.603, 95% CI=(1.269-2.026)], occupation [OR=1.057, 95% CI=(1.009-1.108)], average monthly household income [OR=1.233, 95% CI=(1.127-1.350)] and self-reported physical health [OR=1.272, 95% CI=(1.077-1.502)] were significantly associated with mastopathy. Age [OR=0.778, 95% CI=(0.645-0.939)], household type [OR=2.090, 95% CI=(1.733-2.520)], and BMI [OR=1.218, 95% CI=(1.061-1.399)] were significantly associated with exposure to secondhand smoke. Age [OR=0.829, 95% CI=(0.701-0.980)] and occupation [OR=0.956, 95% CI=(0.923-0.990)] were significantly associated with regular physical examinations. Household type [OR=0.642, 95% CI=(0.398-1.035)] and self-reported physical health [OR=1.983, 95% CI=(1.340-2.935)] were significantly associated with anxiety.

Conclusion: This cross-sectional study shows good description as an appropriate investigation for the identification of women aged 50-70 with certain diseases, health behaviors and psychological health problems in a representative and community-conducted sample of women in Hunan Province of China. It discloses their poor health status.

Background

Population ageing is one of the major global health challenges and the global population of people aged 60 or above will rise from 900 million to 2 billion between 2015 to 2050[1]. China has been seen as vulnerable to the perils of population aging, especially senior women [2]. In 2025, the population of 60

years or above will exceed 300 million, reach 498 million in 2050, and senior women will be more 36.6 million than senior men, while this is accompanied with a higher disability prevalence rate [3-5]. Some of the great threats posed by population ageing are the increasing burden of chronic conditions, particularly non-communicable diseases, and growing population with disability[6, 7]. YANG reported there would be 3 disabled seniors for every 100 people aged 60 or above in 2050 in China based on Sample Survey of the aged population in rural/urban China data[5].

The Global strategy and action plan on ageing and health 2016-2020 mentioned a goal of “by 2020, establish evidence and partnerships necessary to support a Decade of Healthy Ageing from 2020 to 2030”[8]. In 2016, “Healthy China” was proposed as a strategy and the Outline of the "Healthy China 2030" Plan (the Outline) was issued in the same year. The Outline emphasizes a core of people’s health, prominently special populations included the seniors, women and children and it ensures healthy ageing [9, 10]. Healthy Ageing is a process that spans the entire life course and that can be relevant to everyone, predominantly, it pays particular attention to the significant influence of gender norms. Generally, women tend to live longer than men but experience poorer health throughout their lives[7]. Healthy ageing for women needs more attention. At the fourth International Conference on Health Promotion held in 1997 in New Delhi, ageing and women's health were both key areas for discussion and it was a major opportunity to raise and advocate awareness of the status of ageing women and their health. Compared with senior men, senior women were more likely to suffer from various physical and psychological discomforts, cause diseases and affect their health and quality of life finally [11-13]. Moreover, senior women showed a higher prevalence of disabling conditions [14-16].

Although healthy ageing is defined as “the process of developing and maintaining the functional ability that enables well-being in older age”, connected with the intrinsic capacity of the individual (i.e. the combination of all the individual’s physical, mental and psychosocial capacities), the environments he or she inhabits (i.e. physical, social and policy environments), and the interaction between these[7], most previous studies described only one of three[17, 18].

Adopted in this paper, the definition of health follows the broad WHO definition of health as a state of complete physical, mental and social well-being to interpret healthy ageing with three aspects and senior women are defined those who aged 60 and above[8]. Since the health of women in earlier periods of her life forms the basis of her health in later stages of her life, women aged 50-59 years old are seniors in the next 10 years and their health also deserves concerns. Thus, this paper discussed women aged 50-70 years old by a representative and community-conducted study with large sample. This paper aims to investigate the health of women aged 50-70 years old in Hunan Province, come out coping strategy and prompt an active discussion for healthy ageing.

Methods

Study design

This cross-sectional, descriptive and community-conducted study was designed to investigate the most serious and common health problems faced by women of different age groups (10-19 years, 20-39 years, 40-49 years and 50-70 years) and their health needs.

Participants

A total of 10,089 women aged 10-70 years old were recruited. We selected 2790 women aged 50-70 years who were surveyed about the demographic data, diseases-related information, self-reported health, and health behaviors and psychological health. Then we excluded 205 subjects aged less than 50 years or more than 70 years. Totally 2585 women aged 50-70 years were included in the analysis.

Procedures

We used a multi-stage stratified random sampling method. Firstly, one prefecture-level city was randomly selected from the eastern, western, southern, northern and central regions of Hunan Province, respectively and as the primary sampling units (PSU). Secondly, a district (urban area) and a county (rural area) in each PSU were randomly selected. Thirdly, 20 communities were randomly selected from 5 sampled districts and 5 counties. The random methods mentioned above were the random number table method. Finally, all eligible women were recruited from each sampled communities until the required sample size was reached (No less than 250 women of per age group within each PSU were needed according to the project implementation document). The following eligibility criteria were applied at recruitment: a) Women aged 10-70 years old; b) Current residents in Hunan Province; c) Being able to complete the questionnaires independently or with the help of the investigators.

Approval from the Institutional Review Board of the local organization where the researchers were affiliated was obtained. We used the data with permission which did not need a separate ethical approval.

Data collection was implemented by well-trained community health workers, who were local familiarity. The training contents included the purpose and procedures of the current study and the methods to collect questionnaires. Women were recruited through direct door to door visits. Informed consent was obtained.

Measures

Sociodemographic variables

A sociodemographic questionnaire was self-designed and used to describe the demographic characteristics of the participants. It included: age, height, weight, education level, occupation, average monthly household income, self-reported weight and self-reported physical health. Body mass index (BMI) was calculated as body weight in kilograms divided by the square of height in meters. The BMI was divided into 4 grades according to the China's Ministry of Health Disease Control Department criteria, as

follows: BMI<18.5 (underweight), $18.5 \leq \text{BMI} < 24$ (normal), $24 \leq \text{BMI} < 28$ (overweight) and $\text{BMI} \geq 28$ (obese) [19].

Diseases-related information

Women who responded 'yes' to the question: Has the doctor or other health care professionals ever told you that you had any of the following diseases (hypertension, coronary heart disease/stroke, diabetes, thyroid disorders, rarefaction of bone, gastrosis) were classified as having chronic diseases, (colpitis, cervicitis, pelvic infection, hysteromyoma/adenomyosis, oophoritic cyst, endometriosis, gynecologic tumor, pelvic floor dysfunction) were classified as having gynecopathy and (breast hyperplasia, benign breast cyst, breast fibroids, breast cancer) were classified as having mastopathy.

Health behaviors

We used 8 indicators to describe health behaviors as following: drinking, smoking, exposure to secondhand smoke, cervical cancer screening, breast cancer screening, regular health examination, sleep and moderate exercise. Sleep were classified as insufficient (sleep duration <7 hours per day), sufficient ($7 \text{ hours per day} \leq \text{sleep duration} < 9 \text{ hours per day}$) and excessive (sleep duration ≥ 9 hours per day (excessive) [20].

The Patient Health Questionnaire and the Generalized Anxiety Scale

The Patient Health Questionnaire (PHQ-9) was a self-report questionnaire to assess depressive symptoms over the past 2 weeks[21]. PHQ-9 has been translated by scholars in China and the Chinese version of PHQ-9 has showed good sensitivity, specificity and reliability with a Cronbach's α value of 0.857[22, 23]. It uses a 4-point rating scale generating a total score ranging from 0 to 27. The participants in the present study were categorized into two groups: non-depressive symptoms (the total scores were <10) and depressive symptoms (the total scores were ≥ 10).

The Generalized Anxiety Scale (GAD-7) was a self-report questionnaire to assess anxiety symptoms over the past 2 weeks[21]. Chinese version of GAD-7 has been widely used and a Cronbach's α value of 0.898 was found in the previous study which suggested good reliability[24]. The GAD-7 uses a 4-point rating scale generating a total score ranging from 0 to 21. The participants in the present study were categorized into two groups: non-depressive symptoms (the total scores were <10) and depressive symptoms (the total scores were ≥ 10).

Statistics analyses

All data were independently double-entered and validated using EpiData 3.0. Data were analyzed with SPSS 19.0. Descriptive statistics were used to examine the sociodemographic factors, the diseases-related information, health behaviors and psychological health status of the participants, including means and standard deviations (mean \pm SD) for continuous variables, and counts (percentages) for categorical variables. The chi-square test was used for the measurement of the categorical variables, in

order to assess the statistical significances among the groups. Significant variables were used in a multivariate binary logistic regression model to examine the correlating factors of diseases-related information, health behaviors, and psychological health status. The inclusion P -value was 0.05, and the removal value was 0.10. A two-tailed p -value < 0.05 (p -value < 0.10 in logistic regression) was considered significant. Missing values of all items were less than 10%.

Results

Sociodemographic characteristics

Among the 2585 senior women who were present, the mean age was (60.35±5.76). About a third of them completed junior high school, 16.7% completed senior high school and only 3.2% completed higher education. Nearly 60% were farmers. Average monthly household income was below CNY 3000 for 50.4%. More than 50% of the participants covered a normal body mass index, self-reported weight and self-reported physical health. Approximately 60% reported normal blood pressure, blood sugar and blood lipid. The demographic characteristics of the participants are summarized in Table 1.

Table 1 Sociodemographic characteristics of the participants (N=2585)

Characteristics	Total N=2585(%)	50-59 years old N=1221(47.2%)	60-70 years old N=1364(52.8%)	P-value
Household type				
Village	1256(48.6)	622(50.9)	634(46.5)	0.022*
City or town	1315(50.9)	592(48.5)	723(53.0)	
Education level				
Primary school or less	1244(48.2)	409(33.5)	835(61.2)	0.000*
Junior high school	809(31.5)	499(40.8)	310(22.7)	
Senior high school	431(16.7)	245(20.1)	186(13.6)	
College or more	83(3.2)	57(4.6)	26(1.9)	
Occupation				
Farmers	1486(57.5)	673(55.1)	813(59.60)	0.000*
Workers	206(8.0)	115(9.4)	91(6.7)	
Civil servants	35(1.4)	14(1.1)	21(1.5)	
Professional technicians	74(2.9)	38(3.1)	36(2.6)	
Self-employment	96(3.7)	67(5.5)	29(2.1)	
Unemployed	418(16.2)	176(14.4)	242(17.7)	
Others	255(9.9)	130(10.7)	125(9.2)	
Average monthly household income(CNY**)				
<¥3000	1304(50.4)	557(45.6)	747(54.8)	0.000*
¥3000-4999	752(29.1)	385(31.5)	367(26.9)	
¥5000-7999	275(10.6)	143(11.7)	132(9.7)	
¥8000-9999	141(5.5)	69(5.7)	72(5.3)	
≥¥10000	83(3.2)	55(4.5)	28(2.1)	
BMI(kg/m²)				
Underweight	96(3.7)	33(2.7)	63(4.6)	0.006*
Normal	1445(55.9)	675(55.3)	770(56.5)	
Overweight	685(26.5)	355(29.1)	330(24.2)	
Obese	175(6.8)	80(6.6)	95(7.0)	

Self-reported physical health				0.000*
Good	817(31.6)	448(36.7)	369(27.1)	
Fair	1537(59.5)	679(55.6)	858(62.9)	
Poor	217(8.4)	88(7.2)	129(9.5)	

* $P \leq 0.05$ indicates statistical significance

**CNY: Chinese Yuan; 6.72 CNY=1 USD (15 October 2020)

Diseases, health behaviors and psychological health

More than half (51.0%) of participants suffered from chronic diseases, 49.6% was attacked by gynecopathy and 23.6% was attacked by mastopathy. The majority of them did not drink and smoke, but only 30.7% escaped from the secondhand smoke. More than 40% of them attended cervical cancer screening and breast cancer screening. Less than 50% completed periodic health examination.

A half of the participants got sufficient sleep and the mean sleep time was (7.00±1.35) hours per day. Approximately 50.8% exercised moderately for about average day 42.77 minutes and 4.7 times a week and most of them preferred riding.

Only 4.2% of participants reported depression and 3.1% were in anxiety status. The disease-related information, health behaviors and psychological health of the participants are summarized in Table 2.

Table 2 Diseases-related information, health behaviors and psychological health of the participants (N=2585)

Characteristics	Total N=2585(%)	50-59 years old N=1221(%)	60-70 years old N=1364(%)	P- value
Chronic diseases				0.000*
No	1263(48.9)	671(55.0)	592(43.4)	
Yes	1318(51.0)	547(44.8)	771(56.5)	
-Hypertension		231(18.9)	420(30.8)	
-Coronary heart disease/ Cerebrovascular disease		95(7.8)	189(13.90)	
-Diabetes mellitus		84(6.9)	170(12.5)	
-Osteoporosis		92(7.5)	157(11.5)	
-Gastropathy		138(11.3)	145(10.6)	
-Osteoarthropathy		137(11.2)	205(15.0)	
Gynecopathy				0.000*
No	1298(50.2)	553(45.3)	745(54.6)	
Yes	1283(49.6)	667(54.6)	616(45.2)	
- Colpitis/Vaginitis		476(39.0)	466(34.2)	
-Cervicitis		284(23.3)	279(20.5)	
-Pelvic infection		162(13.3)	137(10.0)	
-Hysteromyoma/adenomyosis		80(6.6)	55(4.0)	
-Oophoritic cyst		37(3.0)	21(1.5)	
-Endometriosis		14(1.1)	8(0.6)	
-Gynecologic tumor		12(1.0)	15(1.1)	
-Pelvic floor dysfunction		12(1.0)	14(1.0)	
Gynecopathy-related discomfort in the last two weeks				0.168
No	1745(67.5)	808(66.2)	937(68.7)	
Yes	825(31.9)	406(33.4)	419(30.7)	
-Leucorrhea abnormality		126(10.3)	123(9.0)	
-Pruritus or burning of vulva		95(7.8)	108(7.9)	
-Lumbar and abdominal pain		132(10.8)	135(9.9)	

-Frequent urination and urgency		69(5.7)	110(8.1)	
-Incontinence or leakage of urine		173(14.2)	169(12.4)	
Mastopathy				0.001*
No	1969(76.2)	894(73.2)	1075(78.8)	
Yes	609(23.5)	324(26.5)	285(20.9)	
-Breast hyperplasia		304(24.9)	264(19.4)	
-Benign breast cyst		12(1.0)	20(1.5)	
-Breast fibroids		11(0.9)	5(0.4)	
-Breast cancer		9(0.7)	6(0.4)	
Drinking				0.351
No	2366(91.5)	1113(91.2)	1253(91.9)	
Yes	194(7.5)	98(8.0)	96(7.0)	
Smoking				0.238
No	2459(95.1)	1172(96.0)	1287(94.4)	
Yes	112(4.4)	47(3.8)	65(4.8)	
Exposure to secondhand smoke				0.013*
Every day	856(33.1)	393(32.2)	463(33.9)	
4-6 days a week	225(8.7)	122(10.0)	103(7.6)	
1-3 days a week	395(15.3)	210(17.2)	185(13.6)	
No	793(30.7)	355(29.1)	438(32.1)	
Unclear	254(9.8)	116(9.5)	138(10.1)	
Cervical cancer screening				0.954
No	1398(54.1)	670(54.9)	728(53.4)	
Yes	1119(43.3)	535(43.3)	584(42.8)	
Breast cancer screening				0.478
No	1438(55.6)	694(56.8)	744(54.5)	
Yes	1091(42.2)	511(41.9)	580(42.5)	
Regular health examination				0.009*
No	1276(49.4)	640(52.4)	636(46.6)	
Yes	1202(46.5)	540(44.2)	662(48.5)	

Sleep				0.380
Insufficient	900(34.8)	444(36.4)	456(33.4)	
Sufficient	1357(52.5)	630(51.6)	727(53.3)	
Excessive	228(8.8)	106(8.7)	122(8.9)	
Moderate exercise				0.321
No	1093(42.3)	511(41.9)	582(42.7)	
Yes	1314(50.8)	641(52.5)	673(49.3)	
-Brisk walking	933(36.1)	444(36.4)	489(35.9)	
-Riding	1024(39.6)	481(39.4)	543(39.8)	
-Jogging	196(7.6)	101(8.3)	95(7.0)	
-Dancing	495(19.1)	240(19.7)	255(18.7)	
-Tai chi	70(2.7)	34(2.8)	36(2.6)	
-Yoga	45(1.7)	21(1.7)	24(1.8)	
Depression				0.323
No	2394(92.6)	1148(94.0)	1246(91.3)	
Yes	109(4.2)	47(3.8)	62(4.5)	
Anxiety				0.029*
No	2429(94.0)	1169(95.7)	1260(92.4)	
Yes	81(3.1)	29(2.4)	52(3.8)	

* $P \leq 0.05$ indicates statistical significance

Factors associated with diseases-related information, health behaviors and psychological health

Table 3 showed results of multivariate analysis, which was used to identify the factors associated with diseases-related information, health behaviors and psychological health. All significant variables detected in Chi-square test were included in logistic regression. Age was significantly associated with the history of chronic disease, gynecopathy, mastopathy, exposure to secondhand smoke, and regular health examination. Household type was significantly associated with the history of chronic disease, gynecopathy, mastopathy, exposure to secondhand smoke, and anxiety. BMI was significantly associated with the history of chronic disease and exposure to secondhand smoke. Average monthly household income was significantly associated with the history of chronic disease, gynecopathy and mastopathy. Self-reported physical health was significantly associated with the history of chronic disease,

gynecopathy, mastopathy and anxiety. Occupation was significantly associated with the history of gynecopathy, mastopathy and regular health examination.

Table 3 Factors of diseases-related information and health behaviors among senior women

Characteristics	Coefficient	OR(95%CI)	P-value
Chronic disease (Ref: No)			
Age	0.332	1.394(1.163-1.670)	0.000*
Household type	0.531	1.700(1.416-2.042)	0.000*
BMI(kg/m ²)	0.177	1.194(1.043-1.367)	0.010*
Average monthly household income(CNY*)	-0.124	0.884(0.809-0.965)	0.006*
Self-reported physical health	1.539	4.659(3.913-5.546)	0.000*
Gynecopathy (Ref: No)			
Age	-0.403	0.668(0.564-0.792)	0.000*
Household type	0.289	1.335(1.094-1.629)	0.005*
Occupation	0.044	1.045(1.002-1.090)	0.041*
Average monthly household income(CNY*)	0.218	1.243(1.143-1.352)	0.000*
Self-reported physical health	0.559	1.748(1.510-2.024)	0.000*
Mastopathy (Ref: No)			
Age	-0.289	0.749(0.616-0.910)	0.004*
Household type	0.472	1.603(1.269-2.026)	0.000*
Occupation	0.055	1.057(1.009-1.108)	0.020*
Average monthly household income(CNY*)	0.210	1.233(1.127-1.350)	0.000*
Self-reported physical health	0.241	1.272(1.077-1.502)	0.005*
Exposure to secondhand smoke (Ref: No)			
Age	-0.250	0.778(0.645-0.939)	0.009*
Household type	0.737	2.090(1.733-2.520)	0.000*
BMI(kg/m ²)	0.197	1.218(1.061-1.399)	0.005*
Regular health examination (Ref: Yes)			
Age	-0.188	0.829(0.701-0.980)	0.028*
Occupation	-0.045	0.956(0.923-0.990)	0.012*
Anxiety (Ref: No)			
Household type	-0.444	0.642(0.398-1.035)	0.069*
Self-reported physical health	0.685	1.983(1.340-2.935)	0.001*

OR odds ratio, CI Confidence interval

* $P \leq 0.10$ indicates statistical significance

Discussion

This paper investigated the health situations of 2585 women aged 50-70 years old in Hunan Province of China and identified factors of disease-related information, health behaviors and psychological health among them. These characteristics of their health situations would make it possible to efficiently come out coping strategy and prompt an active discussion for healthy ageing.

We found that more than half of women aged 50-70 years old had a history of chronic diseases, and the top three were hypertension, osteoarthropathy and coronary heart disease, which is lower than the rates reported in other studies in China[18, 25], possibly to do with age, household type, BMI, average monthly household income, and self-reported physical health. Age was a widely risk factor for chronic diseases, people were more likely to suffer from chronic diseases as they got older[26], consistent with a study reported in Finland[27]. Women lived in urban showed a higher prevalence, on the one hand, they kept bad lifestyles and lacked exercises[28]. On the other hand, women lived in rural might be failed to be diagnosed because of the differences in medical level between rural and urban as LI and ZHU[29] reported. The result that the risk of chronic diseases increased with BMI was also discovered in other Chinese studies[30]. In particular, participants reported a lower prevalence with higher economic status. Those people usually behaved healthy lifestyles and acquired much more healthcare information with higher health awareness[26]. Almost all people with a certain disease would feel uncomfortable as an alert and it could reflect by their self-reported physical health. However, average monthly household income could intuitively decide whether to ask for medical help or not with discomfort.

This study showed that 49.6% of participants had a history of gynecopathy and 31.9% reported gynecopathy-related discomfort in the past two weeks, which was above other studies[12, 31] in China, especially the prevalence of colpitis and incontinence. And the primary mastopathy in this research was breast hyperplasia, which was below previous studies in China[12, 32, 33]. The two leading occupations on gynecopathy and mastopathy were both farmers and workers. Compared with other occupations, farmers and workers indicated poor health literacy[34], which suggested they acquired less healthcare service. Contrary to chronic diseases, the relative young showed a higher prevalence of gynecopathy and mastopathy. It notably can be explained by pressure of life and work, dysregulation of hormone and poor hygiene practices[35]. No matter gynecopathy or mastopathy, women lived in urban suffered more easily from our study, probably related with numerous policies and government projects aimed at women's health, such as cervical cancer and breast cancer screening, and gynecopathy and mastopathy investigation by census[35]. This interpretation is likely to be more applicable to urban women as they enjoyed more healthcare resources. Just like chronic diseases, an alert of a certain disease could reflect by their self-reported physical health and average monthly household income could intuitively decide whether to ask for medical help or not with discomfort[33].

Secondhand smoke has emerged as a public health threat. In our study, we found that 33.1% senior women exposed to secondhand smoke every day. Multivariate analysis showed that among the influencing factors of secondhand smoke exposure, the exposure level was lower with age grown, urban was higher than rural area and the level was higher with BMI increased as NI and DONG reported in a cross-sectional study[36]. Population density in urban is higher and people are more likely to be exposed in secondhand smoke. As age grown and BMI increased, people suffer from variety of diseases and the health awareness possible improves. A recent research[37] covered that the secondhand smoke might have great influence on the diseases burden, especially stroke. Thus, we should carry out guidance on smoking cessation and avoidance of secondhand smoke during prevention and treatment for diseases, and provide smoking cessation services for who need to improve the rate of smoking cessation and reduce exposure to secondhand smoke.

Furthermore, our study covered the rate of receiving regular health examination was 46.5%. The frequency of regular health examination was higher with age grown and unemployed status. It can be interpreted by enough time for healthcare and improvement of healthcare awareness. As for psychological health, participants in this study showed a significant difference about anxiety between women aged 50-59 and women aged 60-70, the anxiety level was higher in rural and poorer self-reported physical health. Predominantly, plenty of women in rural were empty nesters who indicated poor psychological and physical health condition, and poor economic status[38].

Additionally, our data showed that 43.3% of participants attended cervical cancer screening and 42.2% attended breast cancer screening. These findings were higher than previous study conducted in China[39]. One possible explanation is the conduct of pilot program for breast and cervical cancer screening free of charge in rural. We also discovered some healthy lifestyle by our participants. Firstly, 50.8% of senior women exercise moderately every week. Previous studies[40-42] showed that moderate exercise could regulate the function of circulation, breath, nerve, incretion and metabolism. Secondly, 52.5% slept sufficiently and 34.8% slept insufficiently, presumably due to physiological function and pathological changes. Diseases often disturbed their sleep distinctly, consistent with previous studies conducted in China[43]. Moreover, few of participants reported drinking and smoking habits, which also showed their healthy lifestyle.

It is pointed out that to achieve women's healthy ageing, priority chronic diseases and gynecopathy should be managed, about 50% of the cases. Based on public health service project, hypertension and diabetes mellitus are the two common chronic diseases. Besides, the results of this study show that osteoarthritis and coronary heart disease should also be concerned, both of which cause serious loss of the quality of life. For gynecopathy and mastopathy, government has paid much attention to advertising and education, as well as free screening and treatment of common gynecological diseases for women.

This study is to investigate the health status of women aged 50-70 years old in Hunan Province, come out coping strategy and prompt an active discussion for healthy ageing. The strengths of this study included the use of an adequately powered, representative and community-conducted sample of women

aged 50-70 years old in Hunan Province and of validated questionnaires designed to measure diseases-related information, health behaviors and psychological health of participants. Our study also had existing and potential limitations that need to be discussed.

Firstly, as the data were collected through questionnaires, reporting bias cannot be excluded. Secondly, self-reporting of diseases is a poor measure for investigating prevalence. Most participants with lower educational level may hide the history of diseases, especially gynecopathy and mastopathy, because they often think them are secrets. Thirdly, sampling was limited to a province in south-central China.

Conclusion

This cross-sectional study shows good description as an appropriate investigation for the identification of women aged 50-70 years old with certain diseases, health behaviors and psychological health problems in a representative and community-conducted sample of women in Hunan Province of China. It discloses their poor health status: more than 50% of them suffered from certain diseases, nearly 50% of them were exposure to secondhand smoke, without cervical cancer and breast cancer screening and no regular physical examination, and less than 50% of them lived with healthy lifestyles. This emphasizes that it is of merit for women to discuss their health status. Based on public health service project, common diseases should be managed, as well as free screening and treatment of common diseases. In addition, strengthen traditional public health measures, provide new preventive interventions, and reduce the level of health risk factors in the population. To sum up, it is important for active and healthy ageing based on following the public health policies and identifying the characteristics of target population.

Abbreviations

WHO: World Health Organization; PSU: Primary sampling units; BMI: Body mass index; PHQ-9: The Patient Health Questionnaire; GAD-7: the Generalized Anxiety Scale.

Declarations

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Authors' contributions

NIE Min, MENG Yan-ting and LUO Yang were involved in study conception and design. XU Chen and QIN Si were responsible for coordinating the study. NIE Min undertook the data collection, conducted the data analysis and drafted the manuscript. FAN Ling and YUE Jing supervised the study and reviewed the first draft manuscript. All authors read and approved the final manuscript.

Availability of data and material

The datasets generated during the current study are available from the corresponding author on reasonable request.

Ethics approval and consent to participate

The study was approved by the Ethical Committee of the Xiangya Nursing School, Central South University. Written consent was obtained from all respondents before the interview.

Competing interests

No conflict of interest has been declared by the authors. The interpretation and reporting of these data were the sole responsibility of the authors.

Consent for publication

Not applicable.

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