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Abstract

Background: Population aging and its consequences area substantial global concern. The growth in the numbers of older people is one of the most important factors increasing the burden of non-communicable diseases (NCDs) on society. The Tabriz Older People Survey (TOPS) aimed to understand the socio-demographics, health-related behaviors, and health profile of older adults.

Methods: This cross-sectional study was conducted on a representative sample of 1362 community dwelling older adults in Tabriz, the most populated city in the northwest of Iran. The sampling method was probability proportionate to size (PPS). Data collection was conducted in the households of the participants from summer 2019 to winter 2020. Trained interviewers administered the questionnaire, which measured socio-demographics, anthropometrics, social support, sleep quality, mental health, past medical history, dietary habits, traditional medicine, physical activity, and other health-related behaviors.

Results: The sample of 1362 consisted of 56.4% fameless and 54.4% were young older people (60-69 years old). Almost half of the sample were completely illiterate. There was no daily walking in 13.3% of the sample, with women reporting a more sedentary lifestyle than males. Out of the 1362 participants, 135 (9.9%) were current smokers, which was higher in males (20.9% vs. 1.5%) and more than 88% of people who lived alone were women. In terms of sleep quality, anxiety, depression, cognitive status, daily functioning, and social support, men were significantly better than women. Hypertension and stroke were the most and least common underlying diseases (81.0% vs. 6.2%).

Conclusions: The findings suggest that older women are significantly worse than older males in terms of social and disability related measures, as well as having a higher burden from some NCDs.

The results of this study might help regional health policymakers to identify targets for improving the quality of life among community-housed geriatrics.

Keywords: demographic aging; older adults; health profile; gender differences; policy making; health promotion

Introduction

The world is currently facing an unprecedented situation, which is the rapid growth in the number and proportion of older adults in the population (1). Although developed countries have begun to face this phenomenon earlier, the United Nation (UN) projects that the most rapid aging will occur in developing countries. Iran is one of the countries that will experience rapid population aging (2, 3),with those aged 60 or older expected to increase from 10% in 2016to more than 33% by 2050 (2).

Although population aging is a major achievement of modern science and healthcare services, this unprecedented demographic change also raises serious concerns and challenges (4). Population aging has created a profound impact on society, such as rising healthcare costs (5). About 20% of those aged 65 and above, who do not have dementia, suffer from some type of mental disorder. It has also been reported that approximately one-third of 95 years olds without dementia have some type of psychiatric disorder (6). Moreover, the proportion of people aged 65 and above in America with one or more chronic disease has increased from 86.9% in 1998 to 92.2% in 2008. Furthermore, it is estimated that from 2010 to 2030 there will be an additional twenty-seven million people with hypertension, eight million with coronary heart disease, and three million with heart failure in the United States of America (7). In addition, most cardiovascular disease (CVD) cases and deaths occur in people over 65 years of age (8).

The increasing burden of non-communicable diseases (NCDs) is a major global public health challenge, and older adults have the highest prevalence for most NCDs and more frequently require treatment (9). According to the World Health Organization (WHO), in 2016,82% of all deaths in Iran were attributed to NCDs, which was an increase on previous years (10, 11). Low physical activity, overweight and obesity, hypertension, and dyslipidemia are among the most important risk factors. The prevalence of obesity in the population over 18 years of age in Iran increased significantly between 2000 and 2016 and has reached 26%of the population (10). Furthermore, the prevalence of obesity in Iranian adults aged 50 and abovewas21.4% (12).

In terms of the proportion of older adults in the population, East Azerbaijan is the fifth highest province in Iran. Tabriz, as the capital of the province, is the most populous city in the northwestern Iran. Tabriz has experienced rapid social and lifestyle changes over recent decades. Along with these changes, the prevalence of known risk factors for NCDs has also increased rapidly. The increasing burden of NCDs is attributable to both an increase in the prevalence of risk factors and in the growing number of older people (9). In 2015, of those aged 60 and above, 2.5% suffered from malnutrition and 26.7% were at risk of malnutrition in Tabriz (13). A high prevalence of hypertension has also been reported in a representative sample of community dwelling older adults in Tabriz, with about 22% being untreated and only 46% being adequately controlled (14).

NCDs generally have strong social determinants and many shared lifestyle risk factors, many of which are modifiable and amenable to interventions (9). In addition, the proportion of older adults is growing and so focusing on their situation is increasingly important (15-17). Social planning and managing these huge demographic changes and their extensive consequences are vital. However, properly planning and dealing with this phenomenon would not be possible without the comprehensive evaluation of the different aspects of aging. As a result, the Tabriz Older People Survey (TOPS) was conducted by the Aging Research Institute (ARI) at the Tabriz University of

Medical Sciences (TUOMS). The aim was to measure socio-demographics, health-related behaviors, and the health profile of older people living in Tabriz. In this study, the health profile of older adults, including their health status, illnesses, disorders, use of medications, cognitive status, health behaviors, living conditions, living arrangements, contributions to society, and their needs for services were assessed. The overarching aim of TOPS was to provide information useful for policy makers and health providers and to identify ways of improving the health status of these older residents.

Methods

Study setting

This study was conducted in Tabriz, the capital of the East Azerbaijan province. Tabriz is the most populated city in the northwestern Iran, with around 1.7 million inhabitants in 2016. Tabriz is the fifth most populous city of Iran, with more than 10 percent of its population aged $\geq$ 60 years. It is also considered to be the second most important industrial city and is divided into 10 municipal districts.

Study population

The population included all community dwelling adults aged $\geq$ 60 in Tabriz, which numbered 174,158 inhabitants, according to Iran's most recent Population and Housing Census in 2016 (18). Inclusion criteria were being at least 60 years old and consenting to participate in the study.

Sampling method

This is a cross-sectional study of a representative sample of community-dwelling older adults living in Tabriz. The sampling was conducted using probability proportionate to size (PPS) sampling for each municipality district of Tabriz city. PPS consists of two steps which broadly involves selecting clusters and then selecting people from within those clusters. In the first step, larger clusters have a greater chance of being selected, while in the second step individuals in smaller clusters have a higher chance of being selected. However, it is generally thought that the second stage makes up for the first stage, so that each individual in the population has the same probability of being sampled (19).

Firstly, the demographic information from the latest national census, which divided Tabriz into the 10 municipal districts and urban blocks, was obtained from the Statistics Center of Iran. This information was used to determine the proportion of older adults that lived in each of the municipal

districts and each urban block, in order to determine the appropriate sample size from each. Following this, 140 blocks were randomly selected from the total of 11,778 city blocks and then 10 older people were randomly selected from each of the selected blocks (i.e. 1,400 people were expected to be included from 140 urban blocks). The details of the number and proportion of the older adults living in the ten municipal districts of Tabriz, the sample size allocated to each districts, and the number of blocks selected from each district are shown in Figure 1.

Data collection

Most of the data for the TOPS-2019 study were collected by trained interviewers. All interviewers were trained by experts in how to ask questions and complete the questionnaire. The interviews were conducted in the participant's home and lasted for 60 to 90 minutes. A panel of experts, including specialists in gerontology, geriatrics, psychology, sociology, nutrition, Iranian traditional medicine, and allied fields suggested and approved the questions. Face validity was ensured by the panel and the questionnaire was piloted on 50 participants. Cronbach's alpha was 0.85%, so the questionnaire was considered reliable. A number of anthropometric and blood pressure measures were also recorded in three sessions before and during the interviews. From summer 2019 to winter 2020, 1362 individuals aged 60 and above were interviewed, meaning a weighted response rate of 97%. Informed consent was obtained from all participants and they were assured about the confidentiality of all information collected. This study was undertaken in accordance with national regulations and ethical guidelines.

Procedure and measurements

The questionnaire consisted of several sections. The first section asked questions about socio-demographic details, including: date of birth, gender, marital status, level of education, family size, health insurance status, residential and living conditions. Income, profession and professional status which are indicators of socio-economic status were assessed at the end of the interview in

order not to affect the interview process. The second sections of the questionnaire consisted of validated scales and tools, which are described below:

1- **Abbreviated mental test score (AMTS):** It is a scale which tests for dementia in older adults. It was first used in 1972 and is currently also used to assess mental confusion and other cognitive impairments (20). The AMTS has ten questions with one point allocated for each. Scores lower than 8 indicate the presence of cognitive impairment, although this should be confirmed using additional tests. The Persian version of the AMTS has been found to be valid for examining the cognitive state of older adults (21).

2- **Socio-economic Status Questionnaire for Urban Households (SES Iran):** This scale was developed in Iran and has been found to have good validity and reliability. The scale is a valuable addition to most health surveys or clinical studies, but can also be used as the main measure in research about health equity and economics (22).

3- **Satisfaction With Life Scale (SWLS):** This scale was developed in 1958 by Diener et al. (23) and has been found to have good reliability and validity in many intercultural studies (24). The scale contains five items, which are answered using a 7-point Likert scale (Strongly dissatisfied to Strongly satisfied). Each item produces a score from one to seven and the overall scores range from 5 to 35, with a higher score representing more satisfaction with life. The validity and reliability of the Persian version of the SWLS has been previously demonstrated (25, 26).

4- **Activities of Daily Living (ADLs):** This scale measures the basic tasks that must be accomplished every day for an individual to thrive. The Katz ADL scale is a widely used instrument that assesses six primary functions, which are: bathing, dressing, going to the toilet, moving around, feeding, and continence. The overall score ranges from 0 to 6, with higher scores representing better conditions (27, 28). The Persian version of the ADL has

been found to be an appropriate and valid measure for assessing the daily activities of older Iranian adults (29).

5- **Instrumental Activities of Daily living (IADL):** The Lawton IADL scale is the most widely used instrument to measure disability levels and assess functioning in community-dwelling older adults (30). The IADL measures more complex activities than the ADL and includes: 1- Ability to use a telephone, 2- Shopping, 3- Food preparation, 4- Housekeeping, 5- Laundry, 6- Transportation method, 7- Medication use, and 8- Handling finances. The IADL scores range from 0 to 8, with higher scores demonstrating higher levels of functioning. The validity of the Persian version of the IADL has previously been confirmed (29).

6- **Mini Nutritional Assessment-Short Form (MNA-SF):** The MNA-SF is one of the most commonly used screening tools for identifying the risk of malnutrition in older adults living in the community (31, 32). The instrument contains six questions, including two anthropometric parameters (i.e. body mass index (BMI) and recent weight loss), a diet parameter (i.e. food intake), a general assessment parameter (i.e. mobility), and two health assessment items (i.e. psychological stress or acute diseases and neuropsychological problems) (33, 34). The nutritional status of each older adult is placed into one of three categories, based on the total score, which are: normal nutritional status, risk of malnutrition, and malnourished (33, 35-37). Previous research in Iran has shown the MNA-SF to have a high degree of agreement with the full MNA and that it is an effective screening instrument for the rapid detection of malnutrition or the risk of malnutrition in the community-dwelling older adults (38).

7- **Anthropometric instruments and conditions:** A Seca portable digital scale (accurate to 100g), a Seca inelastic measuring tape and a stadiometer (accurate to 0.5 cm) were used to

measure each participants' weight (kg), waist circumference (WC) (cm), hip circumference (HC) (cm), and height (cm). The participants were weighed while wearing light clothes and without shoes. Using the measuring tape, the WC measurement was taken at the WHO recommended point (i.e. the midpoint between the last rib and the iliac crest) (39) and HC was taken at the most protuberant area (i.e. the highest HC value). These anthropometric measurements were performed at the participants' place of living. BMI and waist-to-hip ratio (WHpR) were calculated by dividing the values of weight (kg) by the square height (m2) and dividing the WC by HC, respectively.

8- **Hospital Anxiety and Depression Scale (HADS):** Anxiety and depression were assessed using the HADS (40). The HADS is comprised of two subscales which are depression and anxiety. HADS is one of the most frequently used measures of emotional distress (41) and is a valid and reliable self-rating scale that can be used to measure anxiety and depression in both hospital and community settings (42, 43). The overall score for both the anxiety and depression subscales range from 0 to 21,and individuals can be placed into three categories: normal (0 to 7), borderline (8 to 10), and abnormal (11 to 21).The Iranian version of the HADS has been found to be an acceptable, valid, and reliable measure (44, 45).

9- **Duke Social Support Index (DSSI):** The DSSI was developed as a brief and easily administered tool to assess an individual's level of social support (46). The DSSI consists of two subscales, social interaction (4 items) and satisfaction with social support (7 items). The reliability and validity of the Persian version has been previously confirmed (47).

10- **Physical Activity Scale for the Elderly (PASE):** PASE is a brief (5 minutes) and easily scored scale designed to assess physical activity in epidemiological studies on older adults (48). The PASE score combines information on leisure, household, and occupational

activity (49). The PASE assesses the types of activities typically chosen by older adults (i.e. walking, recreational activities, exercise, housework, yard work, and caring for others) and the Persian version (P-PASE) has been found to be valid and reliable (50).

11- **The Pittsburgh Sleep Quality Index (PSQI):** The PSQI measures the quality and patterns of sleep in older adults. It contains seven domains, which are subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction over the last month (51). Each subscale has a range of 0-3, with higher total scores representing lower sleep quality. The psychometric properties of the Persian version of the PSQI have been confirmed (52).

12- **De Jong Gierveld Loneliness Scale:** This scale is a valid and reliable instrument which is used to assess loneliness in older adults. The scale contains the dimensions of social and emotional loneliness and there are three items in each dimension (53). Scores for each dimension range from 0–3 and the overall loneliness score ranges from 0–6, with higher scores demonstrating a higher level of loneliness. The Persian version of the Loneliness Scale has been found to be a reliable and valid measure of loneliness in Iranian older adults (54).

13- **Nutritional habits assessment**: This questionnaire is based on the Traditional Persian medicine (TPM) guidelines regarding nutritional habits (NH). The validity and reliability of the questionnaire has previously been confirmed. The TPM contains 31 questions, with responses being recorded on a 5-point Likert scale ("always" to "never"). Scores from the nine subscales (i.e. food combinations, drinking, eating, time of meals, eating and season, eating and bathing, eating and physical activity, and eating and sleeping) are summed to generate a total NH score (maximum score of 150), with higher scores indicating better nutritional habits (55).

14- **Mizaj (temperament):** Mizaj is the main theory of health and disease in TPM and determines the physical, physiological, and mental characteristics of individuals (56). It has been demonstrated that mizaj changes with advancing age, so there is a demand for specific alterations which best match their changed needs. For example, it can be made by foods whose nature is opposite to the individual's present Mizaj (57, 58). The reliability and validity of the temperament questionnaire has been confirmed by Mojahedi et al. (59, 60).

15- **Pattern of medication use:** Self-reported data on current medication use was also recorded. The term "medication" refers to conventional drugs, including both prescribed and over-the-counter (OTC) drugs. To investigate the pattern of medication use and the prevalence of polypharmacy (defined as the regular use of five or more drugs per day), participants were asked to show the investigators all products they were currently using.

Statistical analysis

An independent samples t-test was used to compare the means of the normally distributed numeric independent variables. The Mann–Whitney U test was used as a nonparametric analog to the independent samples t-test, when the normality assumption did not hold and in such conditions that median was reported. The Chi-square test was used to assess the association between two categorical variables. Descriptive data have been presented as frequency (and percentages) and means (and standard deviations (SDs)) for categorical and continuous variables, respectively. All statistical analyses were conducted using STATA statistical software package (Release 16. College station, TX: StataCorp LP.). A p-value of <0.05 was considered to be statistically significant.

Ethical concerns

The study protocols were reviewed and approved by the Deputy of the Research Ethics Committee of Tabriz University of Medical Sciences (Ethical ID: TBZMED.REC.1395.684).

Results

Baseline characteristics

The socio-demographic characteristics of our sample of older adults are summarized in Table 1. Out of 1362 total participants, 43.6% was male and in most socio-economic conditions the situation was more favorable among men. Almost half of the studied population were completely illiterate, with the illiteracy rate being significantly higher among women than among men (73.5% vs. 26.5%; p<0.001). The majority of the older adults owned their residence, but women were more often tenants than men (61.7% vs. 38.3%). In terms of marital status, the majority of the older people were married, with less than 28% being single. Among single people, 87.7% were women. Inequality was also found in terms of living conditions and family type, with women more often in a worse position than men. More than 88% of people who live alone are women. Although 27.7% of the participants walked for ≥ 60 minutes daily, 13.3% did not walk each day. Furthermore, women had a more sedentary life style than males, with a lack of daily walking being reported by 17.1% of females and 8.5% of males, while the proportion of male participants who walked for at least 60 minutes each day was also higher than among females (42.4% vs. 16.4%; p<0.001) (Table 1).

Social-, health-, and disability-related measures

The results of the social measures, health status and disability measures are summarized in Table 2. In terms of sleep quality, women had higher mean PSQI scores than males (5.97 vs. 4.63), indicating worse sleep. Also, the levels anxiety and depression, as measured by the HADS, were higher among females than males (Depression: 10.63 vs. 9.54; p<0.001 and Anxiety: 7.59 vs. 5.79; p<0.001). Furthermore, scores from the DSSI, IADL, AMTS, and ADL also revealed worse conditions among older women than among males (p<0.001 for DSSI, IADL, and AMTS and

p=0.031 for ADL). However, the mean SWLS score showed a higher level of satisfaction among females, but this was not significant (16.45 vs. 16.61; p=0.466) (Table 2).

Burden of NCDs

The NCDs with the highest prevalence was hypertension (81.0%), followed by cardiovascular diseases (28.2%), and diabetes (26.3%). Males had lower prevalence rates for all measured NCDs except for stroke, which was more common among older men than older women (6.9% vs. 5.7%) (Table 3).

Discussion

The findings of our population-based survey on the older people in Tabriz showed that the prevalence of smoking was less than 10% and inadequate physical activity, as measured by daily walking, was 13.3%. Also, almost half of the participants were illiterate and illiteracy was more common among older women than among men. Men scored more positively in terms of sleep quality, depression, anxiety, cognitive status, and daily living functions. In contrast, men reported a lower satisfaction with life than females, although this difference was not significant. Moreover, the most and the least common underlying diseases were hypertension and stroke, respectively.

The prevalence rate of current and ex-smokers was 9.9% and 6.9%, with smoking being much more common in males than females (20.9% vs. 1.5% were current smokers, respectively). This finding is relatively similar to a cross-sectional survey of 1430 males and 1641 females aged 65 and older from 17 European countries, which reported the prevalence rate for smoking to be11.5% and that smoking was more common among males than females (15.3% vs. 8.6%) (61). Furthermore, a 2014study in Portugal among 407 men and 38 women aged 65-79 years found the prevalence rates for daily smoking to be 9.15% (95% confidence interval (CI): 7.30-11.43) and 2.43 (95% CI: 1.57-3.74), respectively (62). A nationwide study on smoking pattern among10,834 Iranians showed the proportion of current smokers to be 9.6%, with a higher prevalence being found among males than females (21.5% vs. 1.1%) (63). This study also found a higher prevalence rate among those of Turkish ethnicity (12.4%) than of other ethnicities. Nevertheless, when interpreting the results of that study, it is important to note that their study included participants aged 15-70 years old, unlike the present study which was limited to older adults only (63).

In terms of education levels, a 2011 cross-sectional survey of 15,069 older adults in Tehran found that 27.0% were illiterate and that 14.2% had an academic education (64). This finding contrasts

with our survey which showed a much illiteracy rate in Tabriz (48.4%). This relatively large difference might be due to the larger number of higher educational facilities in Tehran. In accordance with our findings, a 2011 study of 1,350 older residents from five provinces of Iran found significant sex differences in the educational level and the illiteracy rates were reported to be 52.3% in older men and 78.4% in older women (65). Improving educational levels of the older people should be undertaken, not only because it is an indicator of social development, but also because it can increase the knowledge of the older adults to reduce modifiable risk factors of age-related disorders and Alzheimer's disease (66).

Several studies have reported significant inequalities in the distribution of education, employment, income, health services, and physical and social activity between men and women (67, 68). A study of 340 old people in Maku, West Azerbaijan province, showed that 54% were inactive and that physical activity, which was measured using the PASE, was low (94.2) (69). Furthermore, a study on those aged 60-80 years old from Shiraz showed that an inadequate level of physical activity was significantly higher among females than among males (92.6% vs. 86.6%; p=0.002). Also in accordance with our findings, a study on the physical activity profile of Iranian adults and the older adults reported that the highest frequency of physical inactivity was in >75 age group (73.8%; 95% CI: 71.5%-76.1%) and this figure was higher in older females than among males (87.2% vs. 62.6%) (70).

A study on the quality of sleep among 400 older people living in the Qazvin province showed that the mean PSQI score was 7.11 and that females had a poorer quality of sleep than males (the mean PSQI scores were 7.39 vs. 6.80; p=0.057) (71). In terms of psychological factors, a cross-sectional study of 1,612 older people residents in the north of Iran reported significantly better social support in males than for females, as measured using the DSSI (mean: 10.4 vs. 9.9; p=0.001) (72). Also, across-sectional study by Nourbakhsh et al. on 300 older Iranian individuals found significantly

better daily functioning in older men than females, as measured by the ADL and IADL (Mean ADL: 18.72 vs. 16.87; p<0.001 and IADL: 14.48 vs. 9.60; p<0.001) (73).In contrast, a study of 1,067 adults aged 60 and older in Tabriz, found an average SWLS level of 14.14 and that females were more satisfied than males (p=0.01) (74). The findings of the present study were in accordance with previous comparable research, in that males had higher levels of sleep quality, social support, and cognitive status, while only their satisfaction with life was lower than among females.

The present study also found that 26.3% of the older participants had diabetes, which is very similar to the results from a large population-based survey in Tehran, where the prevalence of diabetes was found to be 26.2 % in the older adult population. That study also reported that being female and advancing age were both significantly associated with diabetes (75). Possible strategies for controlling diabetes might include making life style changes, such as encouraging more physical activity, and educating the older adults about how to prevent the disease. Likewise, blood sugar levels should be checked regularly in older adults (76). We reported that approximately 81% of our studied population had hypertension, which is considerably higher than previous research in Tabriz, which reported a prevalence of 68% in individuals ≥60 years old (14).

During the period 1980–2012, hypertension was found to be more prevalent in women aged 40 years of age or older than among men in this age group (77). In line with previous research, the present study found that hypertension was almost 13% more frequent in females than among males (86.8 vs. 73.4). The exact reason for this difference is not clearly understood, but it may be due to both biological and social factors (78, 79). Previous research has reported that decreased estrogen levels, following menopause, results in the dysregulation of nitric oxide synthesis, which is a vasodilator (80, 81). Furthermore, an increase in arterial stiffness, the expression of angiotensin II receptors, and salt sensitivity may be other underlining factors inducing hypertension in women following menopause (82). Moreover, the higher prevalence of obesity in postmenopausal women

can predispose them to hypertension (83). According to the Global Burden of Disease 2019 findings, the prevalence rate of stroke in adults aged over 70 years old was higher in females than males (8,176.47 (95% uncertainty interval (UI): 6,832.03-9,877.05) vs. 7,438.10 (95% UI: 6,160.54-8,966.32)) (84), while in Tabriz we found stroke to be more common in males than females (6.9% vs. 5.7%).

The strength of our study is its large sample size and using a wide variety of questionnaires to measure a number of important aspects of health and the social life of the older adults, as well as using face-to-face interviews. However, our study also had several limitations. One of these limitations is related to the cross-sectional nature of the study, which limits our understanding of the relationships between variables. Also, our sample only included residents of Tabriz city and omitted the rural areas. Furthermore, we only evaluated four kinds of NCDs (i.e. cardiovascular disease, stroke, hypertension, and diabetes), omitting other NCDs that cause a high burden in Iran, such as neoplasms, respiratory diseases (e.g. chronic obstructive pulmonary disease), mental disorders, musculoskeletal disorders, and other neurological disorders (e.g. Alzheimer's disease, Parkinson's disease, and multiple sclerosis) (85). In addition, we used self-reported data for measuring underlying diseases and the use of medications, which might not be totally reliable. It is also important to note that our findings are not likely to be representative of the entire Iranian population, since our sample is from a limited cultural, geographical, and ethnic group of individuals.

Conclusion

The findings of the present research have shown that there are significant gender disparities among older adults in Iran. Paying attention to health and social inequalities among older men and women is important for several reasons, including the: importance of addressing inequality, vulnerability of older adults, growing number and proportion of older adults, and the increasing feminization of the aged globally. A better understanding of these disparities helps community leaders and policymakers with social planning and to address health challenges facing older people. This information can be used to target programs and advocate for system improvements that promote health equity. Addressing gender disparities in health and health care access requires new attitudes at all levels of the health system.

List of abbreviations

TOPS: Tabriz older people survey

NCDs: non-communicable diseases

PPS: probability proportionate to size

UN: united nation

WHO: world health organization

ARI: Aging Research Institute

TUOMS: Tabriz university of medical sciences

AMTS: Abbreviated mental test score

SES Iran: socio-economic status questionnaire for urban households

SWLS: satisfaction with life scale

ADLs: activities of daily living

IADL: instrumental activities of daily living

MNA-SF: mini nutritional assessment-short form

WC: waist circumference

HC: hip circumference

BMI: body mass index

WHpR: waist-to-hip ratio

HADS: hospital anxiety and depression scale

DSSI: Duke social support index

PASE: physical activity scale for the elderly

PSQI: Pittsburgh sleep quality index

TPM: traditional Persian medicine

NH: nutritional habits

Declarations

Ethical concerns

The study protocols were reviewed and approved by the Deputy of the Research Ethics Committee of Tabriz University of Medical Sciences (Ethical ID: TBZMED.REC.1395.684). Informed consent was obtained from all participants and they were assured about the confidentiality of all information collected. This study was undertaken in accordance with national regulations and ethical guidelines.

Consent for publication

Not applicable.

Availability of data and materials

Data gathered for the study is available from the corresponding author.

Authors' contributions

MAK Conceptualised the study, supported analysis, wrote the manuscript. SS Conceptualised the study, wrote the manuscript, SAN Supported analysis, edited manuscript. MJMS edited manuscript. SSS Supported analysis, wrote the manuscript. ZY Wrote the manuscript. SS Analysed the data, reviewed and edited the manuscript. AA-Z Conceptualised the study, supported analysis, wrote the manuscript, project administration. The authors read and approved the final manuscript.

Conflict of Interest: The authors declare that there are no conflicts of interests.

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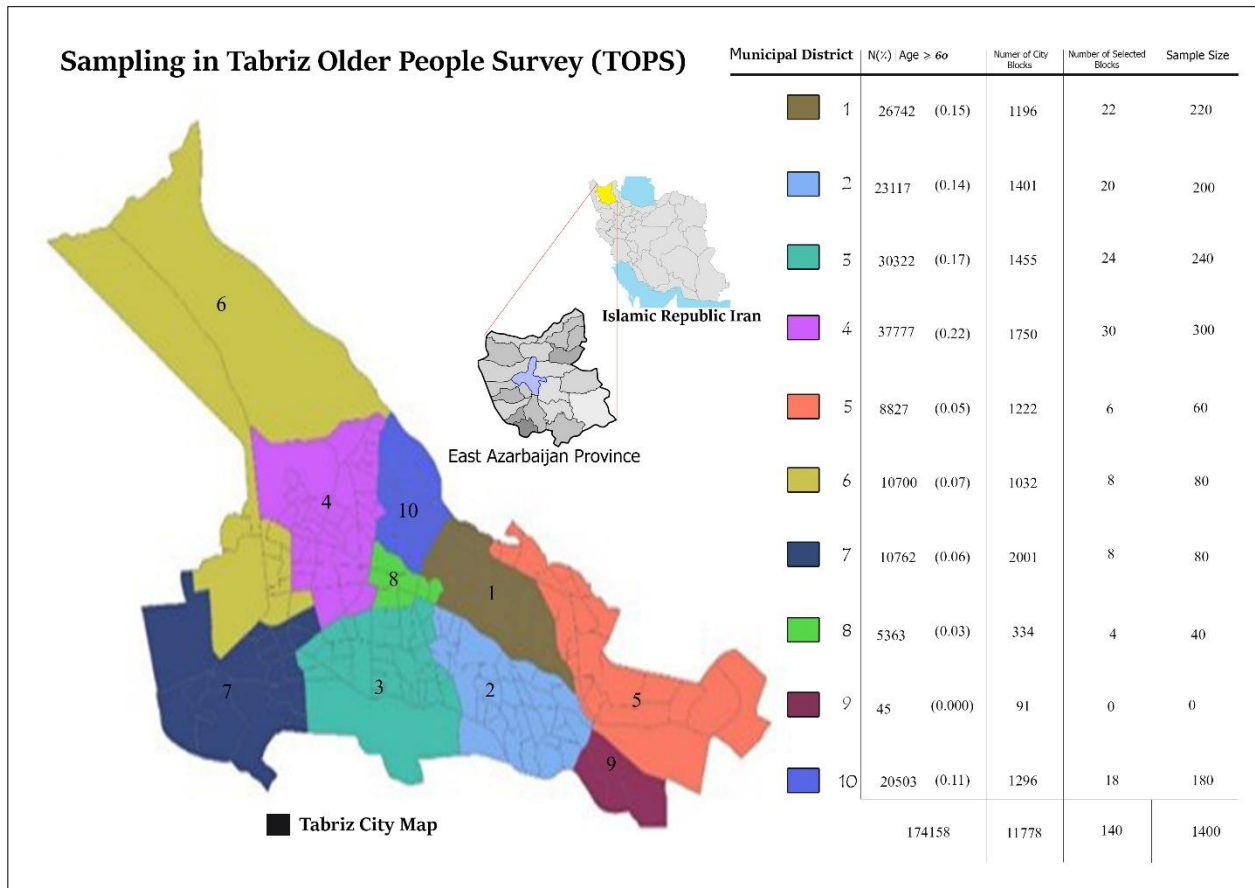| Municipal District		N(%) Age ≥ 60		Numer of City Blocks	Number of Selected Blocks	Sample Size
	1	26742	(0.15)	1196	22	220
	2	23117	(0.14)	1401	20	200
	3	30322	(0.17)	1455	24	240
	4	37777	(0.22)	1750	30	300
	5	8827	(0.05)	1222	6	60
	6	10700	(0.07)	1032	8	80
	7	10762	(0.06)	2001	8	80
	8	5363	(0.03)	334	4	40
	9	45	(0.000)	91	0	0
	10	20503	(0.11)	1296	18	180
		174158		11778	140	1400

Figure 1.The number and proportionof older adults living in the municipal districts andthe allocated sample size and number of blocks selected from each district of the ten municipal districts of Tabriz for the Tabriz Older People Survey (TOPS) study.

Table 1. Socio-demographic characteristics of the sample of community dwelling older adults in Tabriz.

Characteristics		Gender		Total n (%)	P value
		594 Male n (%)	768 Female n (%)		
Age	60-69	305(51.4)	436(56.8)	741(54.4)	0.137
	70-79	201(33.8)	230(29.9)	431(31.6)	
	>=80	88(14.8)	102(13.3)	190(13.9)	
Smoking	Non smoker	379(63.8)	753(98.0)	1132(83.11)	<0.001
	Quit Smoking	91(15.3)	4(0.5)	95(6.9)	
	Current smoker	124(20.9)	11(1.5)	135(9.9)	
Education	Illiterate	174(29.3)	483(62.9)	657(48.4)	<0.001
	Primary	186(31.3)	131(17.0)	317(23.3)	
	Secondary	71(12.0)	47(6.1)	112(8.2)	
	Higher education	163(27.4)	107(13.9)	270(19.9)	
Marital Status	Married	548(92.3)	441(57.4)	989(72.6)	<0.001
	Single	46(7.7)	327(42.6)	373(27.3)	
Housing ownership	Tenant	28(4.8)	45(5.9)	73(5.4)	0.377
	Owner	561(95.2)	717(94.1)	1278(94.5)	
Place of birth	Village	279(47.0)	412(53.6)	691(50.7)	0.016
	Town	315(53.0)	356(46.4)	671(49.3)	
Kind of family	Alone	19(3.2)	145(18.9)	164(12.0)	<0.001
	Nuclear	532(89.7)	516(67.2)	1048(77.0)	
	Extended	33(5.6)	86(11.2)	119(8.7)	
	Other	9(1.5)	21(2.7)	30(2.2)	
Health insurance	Covered	571(96.1)	743(96.7)	1314(96.4)	0.320
	Non Covered	23(3.9)	25(3.3)	48(3.5)	
Supplementary HI	Covered	320(53.9)	356(46.4)	676(49.6)	0.006
	Non Covered	274(46.1)	412(53.6)	686(50.4)	
License & Driving	Current Driving	263(44.9)	24(3.1)	287(21.1)	<0.001
	Stopped driving	103(17.6)	27(3.5)	130(9.6)	
	Lack of license	220(37.5)	717(93.4)	937(69.2)	
Head of family	Himself/herself	581(97.8)	273(35.6)	854(62.8)	<0.001
	Spouse	5(0.8)	435(56.6)	440(32.3)	
	Children	8(1.4)	60(7.8)	68(5)	
Daily walk	Lack of walking	50(8.5)	130(17.1)	180(13.3)	<0.001
	Up to 15 min	43(7.4)	132(17.3)	175(13.0)	
	15- 30 min	125(21.4)	184(24.2)	309(23.0)	
	30-45 min	119(20.3)	190(25.0)	309(23.0)	
	≥60 min	248(42.4)	125(16.4)	373(27.7)	

Table 2. Means for the social measures, health status and disability measures, by gender.

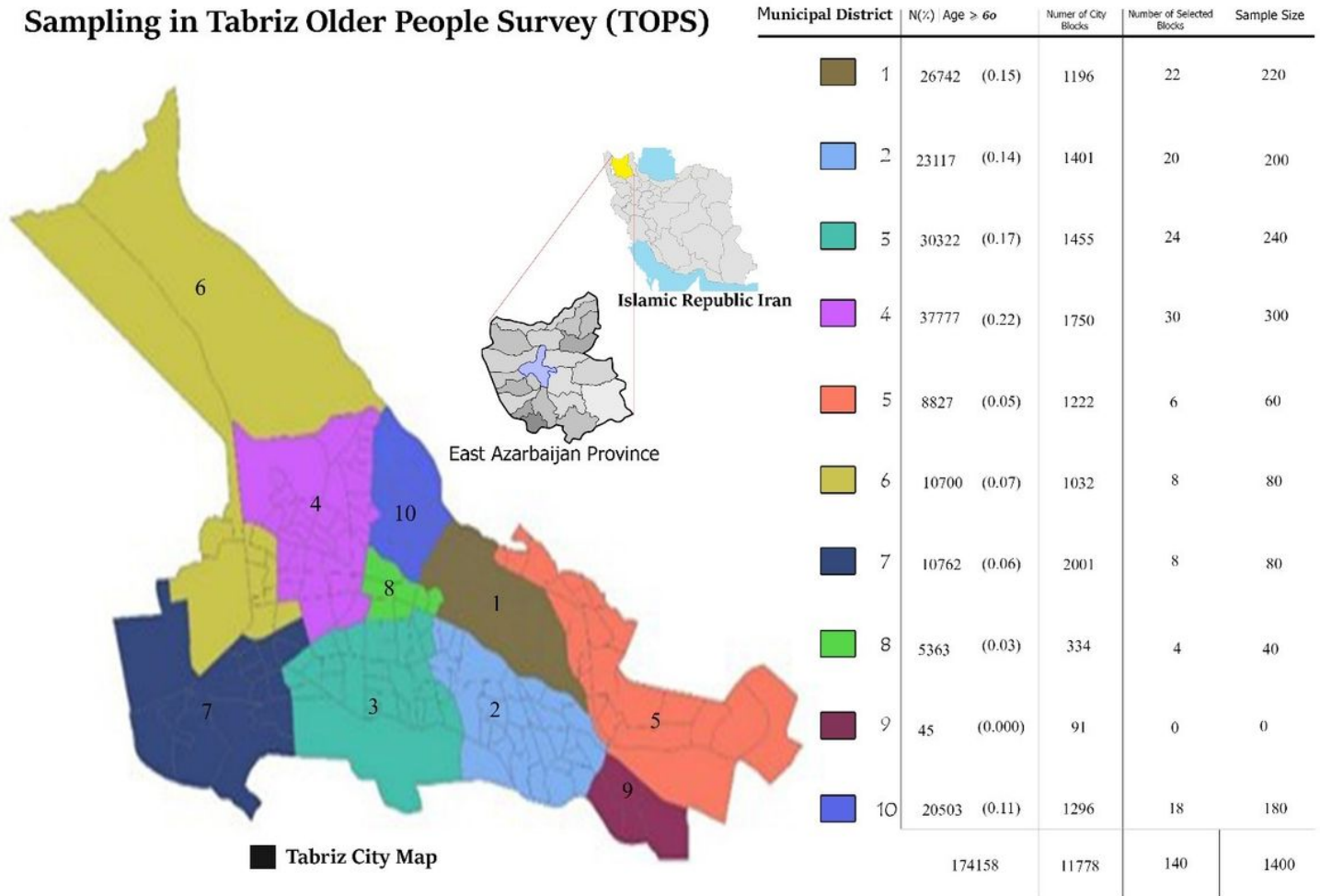| Variable	Gender		P value
	Male (mean ± SD)	Female (mean ± SD)	
PSQI	4.63±2.704	5.97±2.931	<0.001
Depression	9.54±3.201	10.63±3.088	<0.001
Anxiety	5.79±4.699	7.59±5.506	<0.001
DSSI	23.65±4.502	22.69±4.770	<0.001
IADL	7.06±1.812	6.52±2.073	<0.001
AMTs	8.96±2.263	6.62±3.172	<0.001
ADL	5.73±1.009	5.60±1.237	0.031
SWLS	16.61±3.695	16.45±4.071	0.466

Abbreviations: PSQI: Pittsburgh Sleep Quality Index, DSSI: Duke Social Support Index, IADL:

Instrumental Activities of Daily Living, AMTs: Abbreviated mental test score, ADL: Activities of

Daily Living, SWLS: Satisfaction with Life Scale.

Table 3. History of major non-communicable diseases amongthe community dwelling older adults in Tabriz.

Characteristics		Gender		Total n (%)
		594 Male n (%)	768 Female n (%)	
Diabetes	Diabetic	116(19.5)	243(31.6)	359(26.3)
	Non diabetic	478(80.5)	525(68.4)	1003(73.7)
Blood pressure	Hypertensive	436(73.4)	667(86.8)	1103(81)
	Normotensive	158(26.6)	101(13.2)	259(19)
Stroke	Yes	41(6.9)	44(5.7)	85(6.2)
	No	553(93.1)	724(94.3)	1277(93.7)
Cardiovascular	Yes	154(25.9)	231(30.1)	385(28.2)
	No	440(74.1)	537(69.9)	977(71.7)

Figures

Sampling in Tabriz Older People Survey (TOPS)

Municipal District		N(%) Age ≥ 60		Numer of City Blocks	Number of Selected Blocks	Sample Size
	1	26742	(0.15)	1196	22	220
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	9	45	(0.000)	91	0	0
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		174158		11778	140	1400

Figure 1

The number and proportionof older adults living in the municipal districts andthe allocated sample size and number of blocks selected from each district of the ten municipal districts of Tabriz for the Tabriz Older People Survey (TOPS) study.