Non communicable diseases

Why do middle-aged adults use or avoid health services? A study of social and demographic determinants

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Keywords

Healthcare utilization • Middle-aged adults • Social determinants • Health access barriers • Iran

Summary

Introduction. *Middle-aged adults experience distinctive health issues, yet underutilize preventive care despite Iran's strong primary healthcare (PHC) system. This research investigates social and demographic determinants of healthcare services utilization among middle-aged adults in Qom, Iran, to inform the development of targeted community-based screening initiatives.*
Methods. *A cross-sectional study was conducted in underprivileged suburbs of Qom (June-September 2024) among 697 adults aged 30–59, randomly sampled by cluster sampling. Awareness of available services, utilization, and satisfaction with PHC service information were collected via phone interviews. Multivariate logistic regression identified predictors of service utilization.*
Results. *Only 11.8% (n = 82) of the participants were aware of middle-aged health services, and 24.2% (n = 169) had utilized them in the past year. Women had at least one PHC visit 2.5 times more than men (35.3% vs 13.9%, p < 0.001), and utilization increased with age (31.1% among 50–59-year-olds vs. 19.6% in 30-39 years-old, p = 0.023).The strongest predictor was awareness: aware adults had 22.4-fold higher odds of use (95% CI: 11.60-43.29, p < 0.001). Dissatisfaction (by 7.7% of users) was linked to gaps in staff communication (38%), overcrowding (38%), and perceived incompetence (30%) (multiple responses permitted). Work and education were not independently associated with service use after adjustment, suggesting indirect impacts.*
Conclusion. *PHC utilization among middle-aged population is handicapped by low awareness and gender/age disparities. Interventions should prioritize health literacy programs, staff training to improve patient-provider communication, and systemic modifications to reduce overcrowding. Increased outreach to men and younger adults is necessary to ensure equitable preventive care.*

Introduction

Middle age is a critical health transitional phase, often marked by the onset of non-communicable disease (NCD) risk factors and other health-related changes. At this stage, people often confront challenges such as declining health, shifting social roles and heightened awareness of mortality – manifested in fears of loss of autonomy, loss of autonomy, increased fatigue, reduced libido, and cognitive decline [1]. These transitions highlight the importance of proactive healthcare engagement to mitigate long-term health risks. According to the 2016 Iranian National Population and Housing Census, middle-aged adults constitute 42% of the population [2].

The concept of Primary Health Care (PHC) was first developed at the 1978 International Conference on Primary Health Care in Alma-Ata. Aims to tackle essential health issues among communities, PHC ensure basic delivers essential preventive, curative, and rehabilitative care. It is a solution that continues to ensure improvement in the health of communities globally, including Iran. Strengthening the PHC system is emphasized as the most inclusive, effective, and efficient approach to achieving health for all [3]. The accessibility and affordability of healthcare have become primary objectives for achieving universal health coverage [4]. However, the imbalance in resource distribution between primary and secondary healthcare facilities, coupled with policies that resulted in unrestricted access to higher-level services like clinics and hospitals, has led to a bypass of primary care centers. This poses significant challenges to global health access, exacerbates the unequal distribution of medical resources, and hinders access to and continuity of essential healthcare.

The global burden of non-communicable diseases (NCDs) makes this issue even more significant. Each year, these diseases kill 41 million people worldwide, accounting for 74% of global mortality. According to WHO's 2021 report, 15 million of these deaths occur among individuals aged 30 to 69 [5]. The mortality rate from diabetes and cerebrovascular diseases is significantly associated with decreased

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access to healthcare services [6]. Consequently, many countries are implementing routine preventive care for this age group, focusing on risk assessment, brief recommendations, and referrals for necessary measures [7]. In Iran, a health service program for women aged 45-60 years was initially designed because menopause was prioritized in the National Disease Burden Report [8]. The program was initially pilot-implemented in four selected universities of medical sciences (Shahid Beheshti, Iran, Mazandaran, and Shiraz) with various geographical and demographic situations. Subsequently, because of the April 2014 Health Transformation Plan [8, 9], the program's coverage was increased. The emphasis was given to healthy promotion for the entire middle-aged population (30-59 year-old men and women). The integrated care is presently in practice nationwide to promote healthy longevity and reduce premature death through risk factor control and disease prevention through an overall package of care.

This comprehensive health package includes a wide range of services including prevention lifestyle consultation, free vitamin D supplements, mental and behavioral health screening, infectious diseases testing (HIV, STIs, hepatitis, tuberculosis), chronic disease screening (diabetes, hypertension, cardiovascular risks), gender-specific care, and occupational risk assessments [10]. According to national policy, the necessary human resources and infrastructure to offer these services are established in the PHC network.

Despite the launch of this program, studies show that middle-aged Iranians underutilize primary healthcare. For example, a recent national study found that only 13.7% of women aged 30-59 had mammographic screening [11]. Utilization is a critical factor in evaluating the strength of healthcare systems. Many factors influence the utilization of healthcare services, independent of the need for care. Some of these factors are modifiable across population groups, while others are due to biological or environmental differences between groups, such as disproportionate residence in polluted environments, access to healthy food and adequate housing, and education related to the effective use of healthcare services. Other factors related to access differences include health insurance coverage, the income required to receive services, ease of service provision, and discriminatory practices by service providers [12].

Iranian research demonstrates that there exists a group of barriers causing the low utilization of primary healthcare services in middle-aged individuals [13, 14]. These barriers are structural and logistic in nature, *i.e.*, occupation, lack of time, and distance from health centers, and service quality problems like poor staff communication skills and lack of confidence in their technical competence. Widespread self-medication is another significant factor involved. Given the importance of preventive services among middle-aged individuals and the novelty of this age group's program in Iran's primary care system, understanding the utilization patterns of health services and their determining factors is crucial for health sector planning. Therefore, this study was conducted to determine the prevalence and identify the factors associated with preventive care reception and service utilization among middle-aged adults in the city of Qom, Iran.

Methods

This cross-sectional study was conducted in disadvantaged areas of Qom city, the capital of Qom Province, Iran from June to September 2024. Qom Province, located approximately 125 kilometers south of Tehran, has a population of 1.3 million; with 70% falling within the working-age group (15-64 years). Middle-aged individuals (30-59 years) represent a significant proportion of this group, highlighting the importance of addressing their healthcare needs. According to the unpublished national report on Health Indicators of Middle-Aged Adults in Iran, Qom Province has a poor status in terms of access to and utilization of healthcare services [15].

Middle-aged individuals residing in underserved areas of Qom were selected using random cluster sampling, with health centers serving as the clusters. Clusters were selected proportionally based on the population size served by each of the 14 comprehensive health centers covered by the Integrated Health System (SIB).

The sample size was calculated assuming a 50% prevalence of healthcare service utilization ($p = 0.5$) to maximize variability, with a 95% confidence level, a 5% margin of error, a 10% non-response rate, and a Design Effect of 1.5. This yielded an estimated sample size of 697 participants. We made contact with 697 individuals who met were eligible according to our study criteria. The non-response rate was around 10% ($n = 70$) of individuals who could not be contacted or refused to participate. To manage this and reach the target sample size, these 70 non-respondents were substituted by additional eligible adults from our sampling frame. Unfortunately, we were unable to obtain individual-level demographic data for each specific non-respondent adult to perform a rigorous individual - level bias analysis. However, as a check on possible bias, we contrasted the end sample distribution among our 14 health centers with the original proportional distribution in our designed cluster sampling design. We found no systematic differences, suggesting that the non-response did not have a significant impact on the geographic or center-based composition of our sample.

The following measures were used:

- Awareness of the middle-aged service package: Awareness was evaluated by asking participants, 'Are you aware of the middle-aged service package provided at comprehensive health centers?' If participants answered 'yes,' they were further asked to name three services offered for middle-aged adults at the health centers. Only those who correctly

named at least three services were considered as having true awareness and were coded as 'yes.'
- Utilization of services in the past year: Participants were asked, "In the past year, have you visited a comprehensive health center to receive services such as blood pressure measurement, nutritional counseling, or similar services?".
- Satisfaction with services received: Participants who utilized services were asked, "How satisfied are you with the services you received at the comprehensive health center?".

Reasons for dissatisfaction: Dissatisfied participants were asked, "What are the reasons for your dissatisfaction with the services received?" They could select more than one reason from the following options: a) Lack of scientific expertise among staff, b) Services were often delivered too hastily or with too little attention to detail, c) Overcrowding at the center and long waiting times, d) Inappropriate behavior by staff, e) Limited services provided, focusing only on trivial or non-specialized cases.

Verbal informed consent was obtained from all participants prior to the administration of each phone interview. This approach was utilized since obtaining written consent was not practical in a phone-based study. Researchers read a scripted consent statement describing the study purpose, procedures, risks, benefits, and freedom to withdraw at any time. Verbal confirmation of consent to participate was received from the participants. This process was approved by the *ethics committee* of Hamadan University of Medical (IR.UMSHA.REC.1403.047).

Data were analyzed using SPSS software. In the first step, descriptive statistics were calculated, and the chi-square test of independence was performed, stratified by the categories of health care utilization (utilized health care vs did not utilize health care). In the second step, multivariate logistic regression analysis was conducted to identify the potential determinants of health care utilization among middle-aged adults. A p-value of less than 0.05 was considered statistically significant.

Results

A total of 697 middle-aged adults (males 51.6%; females 48.4%) were investigated. Average age was 41.7 ± 8.6 years old. The results of the study revealed that only 82 (11.8%) middle-aged participants were aware of the availability of specific middle-aged services at healthcare centers. Of the 697 participants, 169 (24.2%) utilized health care services in the past year.

Among the 169 participants who had used preventive healthcare services in the past year, 92.3% (156 individuals) expressed satisfaction with the services they received. Of the 7.7% who reported dissatisfaction, 38% attributed it to communication barriers between healthcare providers and participants, 38% to the staff's lack of adequate attention to individuals, 38% to overcrowding at the center, and 30% to the lack of professional competence among the staff. As detailed in Table I, Chi-square tests revealed significant associations between healthcare service use and all demographics investigated ($p < 0.05$ for all). Women reported 2.5 times higher utilization rates than men (35.3 vs 13.9%; $\chi^2 = 43.49$, $p < 0.001$). A gradient by age was observed, with highest use in the 50-59-year age group (31.1%) compared to younger age groups (19.6% for 30-39 year-olds; $\chi^2 = 7.57$, $p = 0.023$). Married participants utilized services more than the unmarried (25.0 vs 11.9%), and unemployed participants utilized services much more than employed ones (34.7 vs 14.6%). Participants with lower educational attainment were more likely to use the services (29% among illiterate individuals vs 14% among those with a university degree). The strongest difference appeared in the awareness of services: those who awarded available services utilized them with an 80.5% rate while that was only 16.7% among those who were not aware ($\chi^2 = 160.03$, $p < 0.001$).

The results of the multivariate logistic regression analysis are presented in Table II. This analysis revealed service awareness as the most robust independent predictor of healthcare utilization. Participants who were awarded of available health services were 22.4 times more likely to utilize healthcare compared to those who not aware (adjusted OR = 22.41, 95% CI: 11.60-43.29, $p < 0.001$). The model confirmed the age-dependent use pattern observed in univariate analyses, with 50–59 year-old adults maintaining significantly higher odds of service utilization compared to the 30-39-year reference group (aOR = 1.93, 95% CI: 1.08-3.45, $p = 0.02$). Male gender had a significant association with 2.02-fold increased odds (95% CI: 0.80-4.74), although this was not statistically significant ($p = 0.10$). Similarly, insured participants also had marginally non-significant 83% greater odds of utilization (aOR = 1.83, 95% CI: 0.99-3.37, $p = 0.053$). Surprisingly, neither education nor employment status retained statistical significance in the fully adjusted model, indicating these factors may not have an independent influence on healthcare utilization after controlling for awareness and demographic characteristics. The regression model results complement the univariate analyses in providing more nuanced insights into the independent effects of each predictor.

While initial results from the Chi-square test (Tab. I) indicated statistically significant associations between each of the independent variables and health care utilization, additional analysis with multiple logistic regressions (Tab. II) found only two variables – health service awareness and age group – to be significant predictors of health service utilization. These findings indicate that factors such as insurance coverage, employment status, and education level may affect health-seeking behavior indirectly or in conjunction with other determinants instead of being direct drivers.

Tab. I. Bivariate Associations between Sociodemographic Characteristics and Preventive Health Care Utilization Based on Chi-Square Tests (n = 697).

Variables	Total	Middle-aged adults(N=697)			
		Utilized health care	Did not utilize health care	X^2	*p*
Sex					
Female	337	119 (35.3%)	218 (64.7%)	43.49	< 0.001***
Male	360	50 (13.9%)	310 (86.1%)		
Age					
30-39	286	56 (19.6%)	230(80.4%)	7.57	0.023*
40-49	250	63(25.2%)	187 (74.8%)		
50-59	161	50 (31.1%)	111 (68.9%)		
Marital status					
Married	655	164 (25.0%)	491 (75.0%)	3.70	0.054
Unmarried	42	5 (11.9%)	37 (88.1%)		
Educational level					
Illiterate	72	21(29.2%)	51(70.8%)	11.93	0.008**
Less than a high school diploma	361	102 (28.3%)	259 (71.7%)		
High school diploma	157	3119.7%)	126 (80.3%)		
University education	107	15 (14.0%)	92 (86.0%)		
Employment status					
Employed	363	53 (14.6%)	310 (85.4%)	38.37	< 0.001***
Unemployed	334	116 (34.7%)	218 (65.3%)		
Health insurance coverage					
Yes	559	149 (26.7%)	410 (73.3%)	8.91	< 0.01**
No	138	20 (14.5%)	118 (85.5%)		
Awareness of middle-aged health services					
Yes	82	66 (80.5%)	16 (19.5%)	160.03	< 0.001***
No	615	103 (16.7%)	512 (83.3%)		

Discussion

This study provides critical insights into the utilization patterns of primary healthcare services among middle-aged adults in Qom, Iran. The findings reveal that only 11.8% of participants were aware of the middle-aged service package, and merely 24.2% had utilized these services in the past year. These low levels of awareness and utilization mean that preventive care among middle-aged adults is not sufficiently high to be able to make a noticeable difference in health outcomes. This trend is consistent with a body of evidence from across Iran, showing low uptake of preventive services. For instance, the MAHCP study showed that more than 27.3% of middle-aged adults were not undergoing routine health screening [14]. This pattern is also reinforced by studies aimed at individual screenings: Enjezab [16], Salabat et al. [17] and Nikkhoo et al. [11] reported low cancer screening rates (less than 30%) among Iranian adults. Such consistent underuse in a range of studies and settings suggests systemic barriers at multiple levels, including restricted public awareness, cultural preferences for curative over preventive care, and structural barriers to seeking care. International comparisons also help to highlight these challenges. In China, for example, many patients do not use primary care centers but opt for higher-level facilities, reflecting a lack of trust and awareness in primary care [18], similar to the Iranian context.

In contrast, studies from some countries like Bhutan, reported a 71.4% utilization rate of preventive services [19]. These disparities underscore the importance of tailored strategies to improve healthcare engagement among middle-aged populations, particularly given the unique pressures they face, such as competing work and family responsibilities and the rising burden of chronic conditions [20, 21].

The low awareness and utilization rates underscore the need for targeted interventions to improve outreach and education, particularly among men and younger age groups, who exhibited lower engagement with services. This suggests Iran's health system may lack effective communication strategies, a gap also observed in bypassing studies where poor awareness of local services drives patients to distant facilities [22]. This aligns with studies in other developing countries, where awareness, health literacy, and socioeconomic status are major determinants of preventive service use [12, 23].

Although univariate analyses revealed utilization was associated with gender, age, employment, and education, multivariate models confirmed only age and awareness as independent predictors. This implies that socioeconomic characteristics (*e.g.,* employment) affect utilization indirectly – for instance, by restricting exposure to health information or influencing perceived need for care. These patterns are seen globally, where healthcare-seeking behavior is influenced by age, gender, and socioeconomic status, but their effects could be moderated by awareness and access [23, 24].

Tab. II. Logistic Regression Analysis of Predictors for Utilization of Preventive Health Care among Middle-aged Adults (n = 670).

Variable	B (SE)	Adjusted OR [95% CI]	*p*-value
Sex (Ref:Female)			0.10
Male	0.70 (0.43)	2.02 (0,80-4.74)	
Age (Ref: 30-39)			
40-49	0.47 (0.25)	1.61 (0.94-2.67)	0.63
50-59	0.66 (0.29)	1.93 (1.08-3.45)	0.02*
Marital status (Ref: Married)			
Single	-0.65 (0.55)	0.51 (0.17-1.53)	0.23
Educational level (Ref: Illiterate)			
Less than a high school diploma	0.24 (0.35)	1.27 (0.63-2.57)	0.50
High school diploma	-0.24 (0.42)	0.78 (0.34-1.81)	0.57
University education	-0.91 (0.51)	0.40 (0.14-1.01)	0.07
Employment status (Ref: Unemployed)			
Employed	-0.38 (0.43)	0.68 (0.29-1.59)	0.37
Health insurance coverage (Ref: Uninsured)			
Insured	0.60 (0.31)	1.83 (0.99-3.37)	0.53
Awareness of middle-aged health services (Ref: No awareness)			
Aware	3.11 (0.33)	22.41 (11.60-43.29)	< 0.001***

The gender disparity (2.5× higher use among women) parallels patterns in settings where cultural and social norms shape healthcare-seeking behaviors [25]. Although Rao and Sheffel [25] found that females are more likely than males to bypass local providers. In Iran, qualitative research indicates that middle-aged men face specific barriers, including time constraints, sociocultural expectations, and limited flexibility in service provision [13]. Addressing these issues requires not only making services more convenient and accessible via male-friendly policies such as extended working hours outside of clinics' regular working hours and men's health clinics but also improving the empowerment of healthcare workers and the work environment and equipment in comprehensive health centers. Specially targeted education and outreach that targets men's views on health and preventive care must also be conducted. The issue is with low utilization of preventive services among men because it can result in late diagnosis of chronic illnesses.

This research discovered that preventive services were utilized by adults in the 50-59 age brackets twice as frequently as for adults in the 30-39 range. This inequality can likely be explained by a combination of factors, foremost of which are the increased load of age-related morbidity and chronic illness, demanding more regular medical interaction. At the same time, this trend is also possibly a reflection of the effectiveness of focused public health outreach efforts. Most healthcare systems have special screening recommendations and awareness campaigns targeted at adults in this age range, urging attendance at preventive measures like cancer screening and cardiovascular risk factor assessment. Nevertheless, the association of age and healthcare use seems more intricate among older adults. While there is some evidence of lower use of primary care services by elderly individuals – perhaps an effect of access barriers in the form of mobility issues, transportation issues, or cost constraints [21, 26, 27] – others, including Liu et al. [28] and a recent study by Smith et al. [26], reported higher attendance at targeted preventive screenings, diagnostic procedures, and vaccinations by elderly individuals. This disagreement is perhaps due to heterogeneity in the type of services measured. Older individuals may underutilize routine primary care visits [such as regular checkups] while actively participating in important preventive measures that they perceive will have a direct impact on their lifespan.

The differences seen would also be due to systemic and cultural reasons. In systems where insurance benefits rise with age, preventive care utilization is greater in older individuals. Where primary care is referral- or copay-based, logistical and cost barriers may deter routine check-ups without screening exempt from coverage. Therefore, the higher utilization rate in the age group of 50-59 is most likely the result of an interaction between biological need, systemic targeting, and evolving health attitudes.

While insurance coverage and employment status were related to utilization on univariate analysis, they were no longer significant after adjustment, indicating that structural barriers and health system navigation may be more important than financial access alone.

Participants cited several primary deterrents to care-seeking. These included barriers rooted in their perceptions of care, such as the perceived lack of attentiveness on the part of staff and a perceived deficiency of professional competence. They also cited more objective structural and communication barriers, including communication issues with providers, severe overcrowding, and long waiting times. This is a critical distinction; the initial set of issues could potentially be tackled with interventions like patient-provider communication enhancement and trust building, but the latter requires system-wide change in clinic management, personnel, and infrastructure. These results are consistent

with international evidence, highlighting the universality of such barriers across health care systems. Research in Saudi Arabia and Korea, for example, illustrates that dissatisfaction often arises from perceived disrespect, discrimination, or inadequate engagement during clinical encounters, subsequently decreasing the likelihood of healthcare utilization [27, 29]. Beyond interpersonal issues, structural inefficiencies – such as overcrowding, rushed consultations, and excessive wait times – pose yet another set of barriers. These organizational failing have been well-documented in resource-poor settings such as Bangladesh and Nepal, where systemic limitations compound patient frustration and deter timely care-seeking [30, 31]. Importantly, perceived quality of care plays a central role. Patients' trust in healthcare systems diminishes when providers are viewed as lacking technical skill or professionalism, a phenomenon seen across diverse geographic and economic contexts [30, 32]. Finally, macro-level issues – including resource constraints, infrastructural shortcoming, and limited availability of services – serve to further entrench cycles of dissatisfaction and underutilization [30-32].

One of the main strengths of this study is its robust sampling approach within a population with unmet needs. Nevertheless, several limitations should be mentioned. First, the cross-sectional design limits causal inference. Second, the use of self-reported data may pose recall and social desirability biases. Third, the application of phone survey method could have been prone to sampling bias since it can potentially underrepresent individuals who do not own phones, are less comfortable with phone interviews, or who do not like responding to unfamiliar numbers and may limit our generalizability of our findings. Finally, given that the research was conducted in Qom, the results may not be fully generalizable to all other socio-cultural contexts in Iran

Conclusion

This study highlights the critical need for multifaceted interventions to enhance primary healthcare utilization among middle-aged adults in Iran. Based on our results, we recommend the adoption of the following specific strategies:

- To enhance awareness: Initiate public health education campaigns targeting middle-aged adults, focusing on the importance of preventive care. The campaigns should particularly target men, who had significantly lower utilization rates of use, through media they access most frequently.
- To improve communication: Develop and mandate training modules for healthcare providers in patient-centered communication and effective counseling skills. This is necessary for building trust and for patients to return for follow-up and preventive care.
- To overcome structural barriers: Policy efforts need to focus on expanding health insurance coverage to restrict financial barriers. Furthermore, clinic hours need to be rearranged to more easily accommodate workers overcoming the access gap observed for working adults.

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Conflicts of interest statement

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. No potential conflicts of interest exist.

Authors' contributions

ABH: Conceptualization, Methodology, Writing original draft. MF: Methodology, Formal analysis, writing. AKS: Conceptualization, Methodology, Funding acquisition, Supervision, Writing.

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