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ORIGINAL ARTICLE

Designing a Model for the Management of Modern Health Services of middle-aged adults in the Iranian Health System

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ABSTRACT

BACKGROUND: Middle adulthood can represent a peak stage of life if health is addressed comprehensively across all dimensions. This study aimed to develop an appropriate model for managing modern health services for middle-aged adults within the Iranian health system in 2019.

METHODS: This mixed-method study was conducted in two phases. In the qualitative phase, the participants were 21 policymakers and experts involved in the middle-aged adults' program at the Ministry of Health as well as provincial and county health centers, selected through purposive sampling. In the quantitative phase, 431 executives of the middle-aged adults' program in Ardabil Province were enrolled. Data were analyzed using SPSS version 20 (Chicago, IL, USA) and Amos software.

RESULTS: The mean age of participants was 35.41 ± 6.94 years. The Content Validity Ratio (CVR) was 0.79, and Cronbach's alpha for the questionnaire was 0.95. Six key components of health service management were identified: human resources, financial resources, executive management, health service package, essential medicines and equipment, and community participation.

CONCLUSIONS: The proposed model was most strongly influenced by human resources and the health service package, whereas community participation had the weakest impact. This model can serve as a guide for policymakers and health authorities to improve health indicators among middle-aged adults in Iran.

Keywords

Middle-age; Management; Health services; Iran

INTRODUCTION

The modern health services program for middle-aged adults in Iran, due to the importance of this age group in the family and society, and especially the necessity of planning for disease prevention and reducing premature mortality, has been developed based on scientific standards in accordance with the country's conditions and priorities [1]. For this reason, this active and productive population requires substantial support to improve quality of life worldwide [1]. Lachman, Robinson, and Wethington consider middle age as a critical life period [2-4]. The National Survey on Midlife in the United States (MIDUS) was the first national study that examined this age group in terms of mental health and illness [5].

This period of life has changed health needs because of the epidemiological transition and the evolving landscape of health hazards in today's world, and responding to these constantly shifting needs has become one of the major challenges for the health system in all societies [6]. In Iran, results from a national survey on non-communicable disease risk factors among adults aged 18 years and older revealed the following prevalence rates: obesity (23%), hypertension (26.4%), diabetes (11%), high cholesterol (22.6%), smoking (10.1%), inactivity (56.4%), and low vegetable consumption (42.1%) [7]. These findings highlight the importance of healthy eating and regular physical activity in preventing chronic diseases, particularly among middle-aged adults [8].

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Increasing physical activity was inversely correlated with lung cancer risk [9]. Promoting regular physical activity and a healthy lifestyle among middle-aged men is one of the most important priorities of preventive work in primary health care [10,11]. People's awareness, especially in terms of health literacy, is an opportunity to lower blood pressure in adults [12]. Middle-aged adults with chronic illness prefer to use public health care [13].

According to our search, no studies have so far been conducted on program management, models of care, and the quality of services provided to middle-aged adults in Iran. Most studies have focused on the incidence and prevalence of diseases in this age group. Integrated health care for middle-aged adults (30–59 years) in Iran, as outlined by the Ministry of Health (2014), emphasizes prevention and early detection of common non-communicable and mental health disorders, promotion of healthy lifestyles, and timely management of diseases. The program includes risk factor assessment, nutritional and physical activity counseling, prevention and treatment of obesity, dyslipidemia, hypertension, diabetes, and anemia, as well as vitamin D supplementation. Mental health services cover screening and management of depression, anxiety, bipolar disorder, sleep disturbances, and substance abuse. Preventive care also addresses respiratory diseases, musculoskeletal conditions, occupational exposures, and urogenital health. Cancer prevention and early detection—particularly breast, cervical, skin, colorectal, and prostate cancers—are prioritized, alongside reproductive health services. This integrated approach highlights education, timely referral, and community involvement to reduce morbidity and disability during midlife.

Therefore, we aimed to determine the model of modern health management services for middle-aged adults in 2019, so that its results can improve the quality, efficiency, and effectiveness of these services and increase satisfaction and responsiveness to the real needs of middle-aged adults in Iran.

METHODS

This study employed a mixed-methods design (qualitative and quantitative) and was conducted in urban and rural health centers of Ardabil Province in 2019. First, the effective components of modern health service management for middle-aged adults by analyzing data were extracted through thematic framework analysis, indexing, and interpretation of in-depth interviews with 21 key policymakers and planners of the middle-aged program, selected by purposive sampling. The experts in this section, who formed the Delphi study expert panel, included health policymakers, officials and specialists from the Department of Middle-Aged Health, provincial-level managers, and experts of the Middle-Aged Health Program in Ardabil, as well as five members of the specialized board and faculty members in Health Services Management from Ardabil University of Medical Sciences and Islamic Azad University, Sari Branch.

Subsequently, in the quantitative phase, 431 executives of middle-aged adults' program were enrolled using the census method.

Inclusion and exclusion criteria

Eligible participants were staff working in urban/rural health centers and health bases with at least two years of work experience. Exclusion criteria were less than two years of work experience and unwillingness to participate in the study.

Data collection was carried out after approval by the Ethics Committee of the Islamic Azad University, Sari Branch. Written informed consent was obtained from all participants, and the study purpose and confidentiality of data were explained to them.

Variables and data collection tool

Data were collected using a researcher-designed questionnaire consisting of four demographic questions (place of employment, age, gender, and education level). The questionnaire also include: 13 items on financial resources, 16 on executive management, 19 on human resources, 12 on basic medicines and equipment, 8 on community participation, and 18 on the health package of the program. Responses were measured on a 5-point Likert scale: strongly agree (score 1), agree (score 2), no opinion (score 3), disagree (score 4), and strongly disagree (score 5).

The content validity of all questionnaire items (higher than 0.59) and construct validity were confirmed using confirmatory factor analysis.

Data analysis

Data were analyzed using Amos software and SPSS version 20 (Chicago, IL, USA). Descriptive statistics included mean, standard deviation, median, frequency, requency, percentage, skewness, and kurtosis. Analytical tests included the chi-square index, chi-square/degree

of freedom ratio, goodness-of-fit index, root mean square error, and adjusted goodness-of-fit index. The final model was further evaluated using the Friedman test, based on factor loadings.

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RESULTS

The mean age of the participants was 35.41±6.94 years. Among the 409 participants, 359 were female (87.8%), and 50 were male (12.2%). The content validity index (CVI) was 0.95, the content validity Ratio (CVR) was 0.79, and Cronbach's alpha coefficient for all questions was 0.95.

The CVR was calculated using the following formula [15]:

$$CVR = (n_E - N/2) / N/2$$

where n_E represents the number of experts who selected the option "essential," and N is the total number of experts (14 in this study). According to Lawshe (1975), who recommended that the content domain of the instrument should be identified prior to assessing its validity and reliability [14], with the participation of 14 experts, the minimum acceptable CVR for the questionnaire was set at 0.51, which was achieved in this study.

The questionnaires were then emailed to the expert panel, who were asked to evaluate each item separately using three criteria ("essential," "useful but not essential," and "not necessary") on a 5-point Likert scale.

The CVI was calculated using the following formula:

$$CVI = \text{Number of experts rating the item as 4 or 5} / \text{Total number of experts}$$

To assess reliability, the designed questionnaire was re-administered to the same participants after a two-week interval. The test-retest method was then used to evaluate the questionnaire's reproducibility [16]. Cronbach's alpha coefficient for all components—including financial resources, middle-aged health services management, executive management of the middle-aged program, program equipment, community participation, and the program's service package—was found to be above 0.7 at both stages.

To investigate the suitability of the proposed model, Table I shows that all indicators were appropriate for the managing modern health services in middle-aged adults in the Iranian health system. In addition, results of the structural equation modeling (SEM) of new health care management for middle-aged adults, shown in Table II, indicated that the components played a significant role in the shaping the new health care model for middle-aged adults. Fow example, the executive management component accounted for 41% of the variance in modern health services management and affected 64% of the overall changes.

Index	Estimated value	Allowable limitation
Chi-square value	4287.63	_
Chi2/df	1.21	<3
GFI	0.81	>0.8
RMSEA	0.02	<0.02
CFI	0.91	>0.85

Table I. *Indicators of suitability of modern health services management for middle-aged adults in the Iranian Health System*
CFI: comparative fit index; Chi2/df: chi-square degrees of freedom; GFI: goodness of fit index; RMSEA: root mean square error of approximation

Number	Components	Factor load	Coefficient of determination	T Value
1	Financial resources	0.54	0.30	-
2	Executive management	0.64	0.41	4.11
3	Human resources	0.54	0.29	4.00
4	Basic medicines and equipment	0.59	0.34	3.60
5	Community participation	0.62	0.38	3.95
6	Health services package	0.60	0.36	4.23

Table II. *Statistical characteristics of analysis of modern health services management of middle-aged adults in Iranian Health System*

Components	Mean score	Priority	Friedman statistics value	*p*-value
Financial resources	2.97	4	1983.01	>0.001
Executive management	4.08	3		
Human resources	5.78	1		
Basic medicines and equipment	2.03	5		
Community participation	1.00	6		
Health services package	5.14	2		

Table III. *Ranking of components in the management of modern health services for middle-aged adults in the Iranian Health System*

Finally, the results of Friedman test (Table III), showed that the human resource component (mean score = 5.78) and the health service package component (mean score = 5.14) were the most important components, while community participation ranked lowest in importance for managing modern health system for middle-aged adults in Iran.

DISCUSSION

The purpose of this study was to determine the component affecting the management of modern health services used for middle-aged adults in the Iranian health system, using a qualitative and quantitative design. Six components were recognized: human resources, financial resources, executive management, health services package, basic medicines and equipment, and the community participation.

Based on the results, the human resource component, with an average score of 5.78, was identified as the most influential. Human resources for health include all health care providers, whose main purpose was to promote health [17]. In this program, service providers at the first level of care included general practitioners, midwives or health care providers, mental health professionals, and nutrition experts. One subcomponent of the human resource was the empowerment of service providers; if primary care teams (i.e. doctors and nurses) are competent in their roles, they can effectively manage chronic disease or HIV [18]. Another subcomponent was the proportional distribution of human resources since the quality of health service delivery depends strongly on the equitable distribution of providers [19]. In practice, however the distribution of human resource is not proportional to the service volume at health centers [20]. Moreover, financial incentives and attractiveness of urban practice in many African countries have led to reluctance among providers to work in rural areas [21].

The second most influential component, with an average score of 5.14, was the health services package. One important subcomponents was the comprehensiveness of care, which emphasizes delivering integrated services based on scientific evidence. Hopman et al. highlighted the benefits of comprehensive care, such as the referral of patients with generalized disability and multiple complications to specialized levels [22]. Other studies considered comprehensiveness more important than other care indicators [23], while Muldoon et al. found the opposite [24]. Such discrepancies may be due to varying primary health care priorities across countries. Another subcomponent was accountability. Health systems worldwide are increasingly focused on improving responsiveness to patients and communities [25]. While accountability has been reported as the lowest-quality dimension in some contexts [26], in this study it was ranked as the second priority of the middle-aged adults' service package.

The third most influential component, with an average score of 4.08, was executive management. A key subcomponent is intersectoral collaboration, which has been emphasized since the Alma-Ata Declaration as central to health promotion [27]. Such collaboration has proven essential for malaria control at national, regional, and community levels [28] and for tackling non-communicable diseases through multidisciplinary, multi-partner approaches [29]. In this study, intersectoral collaboration was also considered valuable for screening middle-aged adults for non-communicable diseases in both governmental and non-governmental settings. Another subcomponent was the use of electronic health records, which can improve quality of care [30]. However, Montague noted that current systems are not adequately designed according to ergonomic and human–computer interaction principles [31], which aligns with the findings of this study.

The fourth component, with an average score of 2.97, was financial resources. Financing is a key determinant of health system performance, emphasizing fair and progressive financing,

government support, and mutual subsidies [32]. In this study, subcomponents included government financial support, development of insurance liabilities, public–private partnerships, and private sector involvement. Government funds, such as the Health Services Fund, provide free services, increasing client uptake [33]. Similarly, private investment expands service provision and access [34,35]. The WHO considers health insurance a promising mechanism for achieving universal health coverage [36], and strong evidence supports community-based and social health insurance in strengthening financial protection and access [37,39]. Education ministries should incorporate health insurance topics into school curricula to increase awareness among youth, fostering long-term participation and reducing reliance on the state alone for financing health care [40].

The fifth component, with an average score of 2.03, was basic medicines and equipment. Ensuring access to essential medicines and up-to-date equipment is vital, as shortages can increase morbidity, mortality, and reduce quality of care. Tumwine et al. attributed inadequate access to factors such as insufficient personnel training, transportation issues, lack of supervision, and insufficient funding [41]. Vitamin D supplementation was identified as a critical medicine for middle-aged adults in Iran. Al Bathi et al. reported that 53.5% of people were unaware of their deficiency, and most had limited knowledge and negative attitudes about vitamin D [42]. Equipment gaps were also noted, particularly between urban and rural facilities, with the latter often lacking modern infrastructure [21]. Better infrastructure has been associated with greater patient satisfaction [43].

The sixth and least influential component was community participation, with two subcomponents: campaigns and cyberspace. Given the widespread use of mobile phones and social networks, virtual platforms can be leveraged to educate and inform middle-aged adults about non-communicable disease prevention and management. Strategies include improving media literacy, developing national social networks, and using mobile health applications. For example, obesity management apps allow users to track calorie intake and physical activity, integrate with personal health records, and share progress for peer and professional support [44,45]. Campaigns and applications should therefore be tailored to the needs of the population to enhance engagement [46] and ensure accessibility [48].

A key strength of this study was the inclusion of all middle-aged program executives and their high participation rate. A limitation was the limited availability of global studies on health care for middle-aged adults. Furthermore, as this study was conducted in only one province, further research at the national level with larger samples is recommended.

CONCLUSIONS

The proposed model was mostly affected by the components of human resources and the health package fpr middle-aged adults, while it was less influenced by community participation. Since this study was based on a survey of middle-aged program experts and executives in the country, and role of some of these components in managing middle-aged adults' health services remains fragile, the Ministry of Health should, in formulating its policies with a specific focus on the health needs of this population group, enact laws to strengthen and protect these key components in Iran.

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Conflicts of interest

The authors declare that there is no conflicts of interest.

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