

# Process Evaluation of a National Elderly Nutrition–Care Program in Iran: Perspectives of Clients and Providers

This article was published in the following Dove Press journal:  
*Risk Management and Healthcare Policy*

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**Objective:** As aging populations increase, many countries have begun implementation of policies to improve elder health and nutrition. This study evaluated key process components of nutrition sections of a national elderly integrated–care program in health-care centers in Iran.

**Methods:** With stratified three-stage random cluster sampling, a total of 256 elderly subjects (clients) and 76 staff members of health-care centers (providers) participated in the study. Quantitative and qualitative data were collected using two self-administrated questionnaires to evaluate various components of process evaluation for clients and providers. Program reach was measured by the ratio of the number in the target group who underwent the program to the number of eligible individuals. Exposure rate was measured as clients' awareness of program services. Delivery and fidelity were assessed from providers' reports for each service. Satisfaction rates were assessed for the whole program and for each service of the program. All reasons behind strengths and weaknesses in each of the process-evaluation components were examined and are reported in detail.

**Results:** The clients reported low-reach (20.0%) and moderate-exposure rates of 77.5%, with a program target of 90%. Primary training sessions were delivered to the providers as intended (100%), but most planned services for clients, especially vitamin and mineral supplementation, follow-up, and physical activity sessions, were poorly implemented, as they were delivered correctly to 24.7% (n=63, vitamin and mineral supplementation), 24% (n=62, follow-up), and 40.3% (n=103, physical activity sessions) of the clients, with a set program goal of 60%. An overall low level of implementation fidelity was observed, and 39.3% (n=30) of the providers believed that most clients did not benefit from the nutritional services. Overall, less than half (42.8%, n=101) the clients were highly satisfied with the program.

**Conclusion:** The process evaluation showed insufficient reach, exposure, and fidelity of the program, as well as imprecise delivery of some services, which resulted in low levels of client satisfaction. The findings may have implications for further reinforcement of the program, and indicate the importance of continuous monitoring and evaluation of such programs.

**Keywords:** process evaluation, elder, nutrition, elderly integrated–care program, national, Iran

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## Background

Population aging is considered one of the most important social transformations of the century, and can significantly affect every nation's health, social, and economic levels.<sup>1</sup> Elder, or old age, refers to those >65 years in age in developed countries and >60 years in

most developing countries.<sup>2</sup> Worldwide, the elder population is increasing rapidly, with one in eleven individuals categorized in this age-group.<sup>3</sup> According to the World Health Organization, the elder population will rise to 2 billion by 2050.<sup>4</sup> It has been reported that 23.1% of the total disease burden can be attributed to disorders among the elderly, as this is in high-income countries is estimated at 49.2% and at 19.9% in low- and middle-income countries.<sup>5</sup>

An effective partnership between government, the private sector, and international organizations helps developed countries increase quality of life and prevent disabilities among this age-group.<sup>6</sup> Prevention or amelioration of the high burden of cost and promotion of health among the elderly can be achieved through dedicated population approaches to nutrition and physical activity (PA) using public services.<sup>7</sup> Although there are different types of national elderly-nutrition strategies in developed countries,<sup>8,12</sup> developing nations are still struggling, indicating a substantial need for formulation of appropriate policies to improve elder health.

The elder population of Iran is growing faster than in Western countries: currently, one in ten people in the country is older than 60 years. It is predicted that in just 35 years, this proportion will have increased to around one in three.<sup>13</sup> Iran is facing emerging challenges related to this demographic transition, including population aging, changes in people's needs, unsustainability of resources, and hospital-centered health services.<sup>14,16</sup> In 2006, the Ministry of Health and Medical Education began a comprehensive intervention initiative: the elderly integrated-care program (EICP). Before nationwide implementation, EICP pilots were conducted in four selected provinces.<sup>17</sup> In 2014, the EICP was implemented in the Tabriz metropolitan area (capital of East Azerbaijan province), located in the northwest of Iran. According to the latest population census of Iran in 2016, the Tabriz population was 1,558,693, among whom 108,184 (11.56%) were elderly.<sup>18</sup>

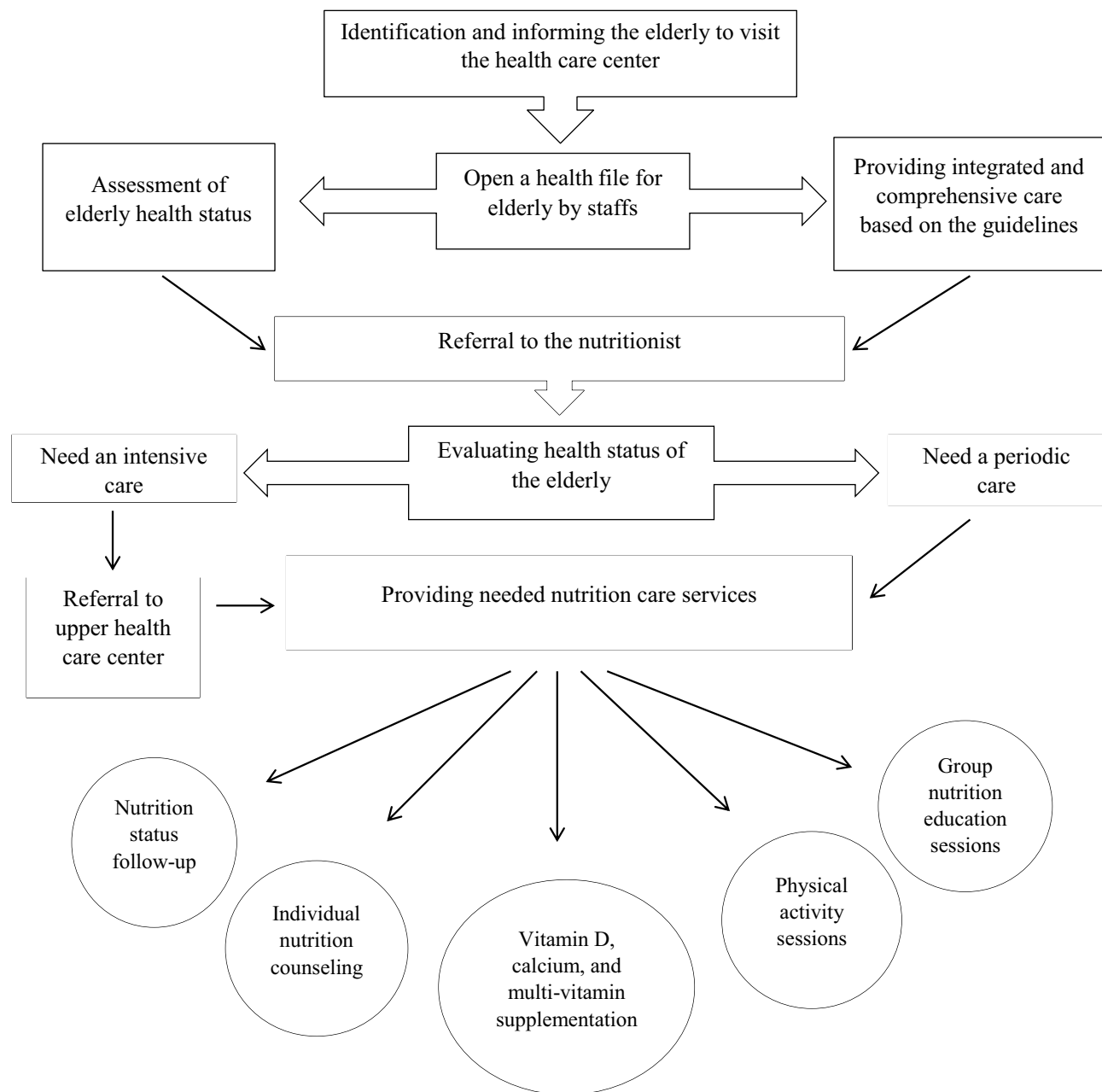
## Overview of the Elderly Integrated-Care Program

The EICP is a part of the first-level health-service program in Iran. The goal of this health program is to improve the health of people, decrease public-health costs, and boost social protection. This program focuses on various health dimensions of the elderly, including lifestyle, nutrition, PA, mental disorders, and chronic disorders, such as hypertension,

diabetes, abnormalities in lipid profile, and osteoporosis, as well as smoking, vaccination status, dental health, and high-risk behaviors. The activities are specified in accordance with seven strategies: periodic assessment, classification of clients, prevention and therapeutic care, public health education, health consultation, required follow-up, and referral to upper health-care centers (Table 1). The nutritional components of the program are also summarized in Figure 1. After implementation of the EICP for 4 years, there is a substantial need to evaluate dimensions, depth, and consequences of the program, aiming at making revisions in the process levels of the program. This is a report on the process evaluation of the

**Table 1** Nutritional components of elderly integrated-care program in Iran

Strategy	Action
Periodic assessment	Investigation of family history of diseases Investigation of health risk factors Investigation of lifestyle situation Assessment of nutrition status Assessment of drug history
Classification of clients	Apparently healthy elderly At-risk elderly Diseased individuals
Prevention and therapeutic care	Supplementation (vitamin D and calcium for all clients, multivitamins for elderly with BMI <22) Prescription of other drugs and supplementation according to state licenses
Public health education	Providing recommendations and tutorials using training packages Education on healthy lifestyle, disease-symptoms field (eg, unhealthy foods, low physical activity, smoking, high-risk behaviors) Education of elderly and their families regarding prevention of disease, self-management activities, and correct methods of taking drugs Reforming social misconceptions Group counseling
Health consultation	Individual counseling and providing diet programs
Required follow-up	Following up patient health and care status Following up status of service presentation to elderly by telephone calls
Referral to upper health centers	Referral of elderly to higher therapeutic levels Record actions taken in patient file



**Figure 1** Process and components of elderly integrated nutrition-care program in health-care centers of Iran.

elderly integrated nutritional-care program (EINCP) from the perspectives of both clients and providers, in order to clarify both strengths and weaknesses of the program.

## Methods

### Field of Study and Participants

This cross-sectional study was conducted in Tabriz between February and June 2019. The EINCP process was evaluated in two dimensions using perspectives of the clients (elderly) and providers (health-care staff).

A stratified three-stage random cluster-sampling method was used to select the participants. Tabriz has 19 health-care complexes, all of which were selected by census for the first stage. The second stage was the selection of 32 of 57 health-care centers as clusters. The clusters were selected in such a way that all health complexes and municipal areas of the city were covered. The third stage was random selection of subjects from each cluster using simple randomization tables, based on a probability proportion-to-size sampling technique. The inclusion criterion

was residents >60 years of age who had been covered by one of the health-care centers of Tabriz for at least 1 year. According to  $\alpha$ -risk of 5%, margin of error of 5%, and confidence level of 95%, the minimum samples of clients and providers were estimated at 246 and 66, respectively. Based on a 25% loss in participation, final sample sizes were 308 clients and 83 providers. Ultimately, 256 clients and 76 providers participated in the study (Figure 2) and signed an informed consent. This study was performed in accordance with the Declaration of Helsinki. The protocol was approved by the Ethical Committee of Tabriz University of Medical Sciences, Tabriz, Iran (IR.TBZMED.REC.1397.1018).

## Design and Process-Evaluation Components

This process-evaluation study was conducted using the process-assessment framework developed by Hughes and Margaretts.<sup>19</sup> Components of the process evaluation and their description are shown in Table 2. Both clients and providers evaluated the program using two distinct self-administered questionnaires. Elements of process evaluation were translated into structured questions to develop these study questionnaires.<sup>20,22</sup> For the next stage, a panel of experts specializing in the fields of gerontology (n=2), nutrition (n=3), and health policy (n=5) validated the instruments. Content-validity index and content-validity ratio values of both questionnaires were calculated and found acceptable: 0.93 and 0.89 for the clients' questionnaire and 0.79 and 0.88 for the providers' questionnaire, respectively. Reliability of the scales was assessed through the questionnaires being completed by 36 eligible clients and seven providers. After 4 weeks, a retest was conducted using the same participants. Cronbach's  $\alpha$  for both provider and client scales was 0.89 and 0.83, respectively. Scores >0.80 are generally considered acceptable.<sup>23</sup>

## Data Analysis

All responses to open-ended questions were transcribed to analyze qualitative data. Two researchers independently categorized answers to open-ended questions to identify relevant themes, which were then organized by topic and summarized. Disagreement between the reviewers was resolved through consultation with a third reviewer. Quantitative data are represented by means  $\pm$  SD or n (%). Descriptive statistics were obtained using SPSS version 20.0.

## Results

### Characteristics of Study Participants

A total of 256 clients (104 men and 152 women) participated in the study. The mean age was  $64.7 \pm 3.92$  years. In all, 89.8% of clients had no academic education, and nearly all (97.3%) were married. The full questionnaire-response rate was 92.2% (n=236). A total of 76 program providers of mean age  $38.6 \pm 5.80$  years also responded to the providers' questionnaire (response rate of 100%).

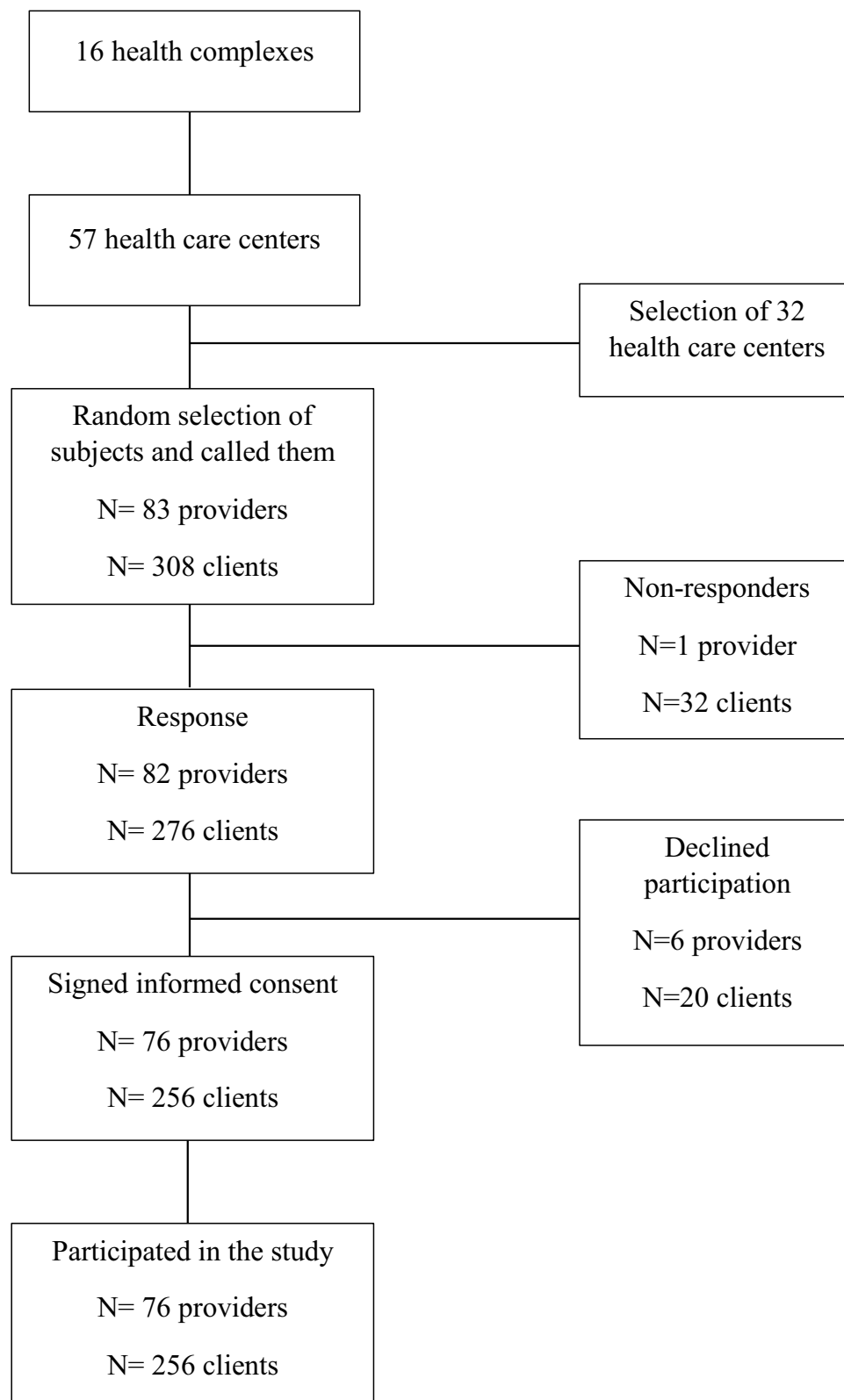
### General Perspective of Participants

Program reach was calculated by the number of elderly who underwent the first evaluation, divided by the number of those potentially eligible. According to the latest national census, a total of 168,744 elderly reside in Tabriz.<sup>18</sup> Process evaluation showed that health-care centers provided nutrition screening to 33,789 elderly, and thus EINCP reach was estimated at 20%. The program suggests arranging a quarterly schedule (four meetings per year) of introductory meetings for the providers. These meeting sessions were held as suggested. Further, according to results of postinstruction analysis, components of the EINCP (Table 1) were correctly and fully delivered to all providers (100%; n=76).

Tables 3–6 show the perspectives of clients toward the EINCP. Of the responders visiting the health-care centers at least once, 77.5% (n=183) were exposed to the nutritional services provided through the EINCP. This did not reach the program target of 90%. Although 86.8% (n=178) of clients believed that providers gave them enough time to provide and discuss their health needs, only 58.5% (n=138) were fully satisfied with their meeting time. The limited number of providers and unrelated fields of expertise, particularly regarding weight and blood-pressure measurements, were the principal factors that affected client satisfaction. All providers were aware of basic principles of the nutritional-care intervention and tried to follow them in the intended manner. From the providers' perspective, fidelity of intervention components and tools were not adequate, as 39.3% (n=30) of them believed that most of the referred elderly did not benefit from these services.

### Face-to-Face Nutrition-Education Meetings

With regard to face-to-face nutrition-education services for clients who had nutrition-related disorders, 16.1% (n=38)



**Figure 2** Flowchart of the study.

**Table 2** Process-evaluation components

	Rationale/purpose	Capability	Data type	Asking of	
				Clients	Providers
Reach	Proportion of intended audience who actually took part in the program	Generalizability	Quantitative	✓	✓
Exposure	Engaging of clients in receiving messages about the program	Dose received	Quantitative	✓	
Delivery	Levels of implementation of all planned components	Completeness	Quantitative	✓	✓
Fidelity	Quality of the implementation	Quality and accuracy	Quantitative and qualitative	✓	✓
Satisfaction	Happiness of participants with the program	Improvement of running strategies	Quantitative	✓	
Context	Environmental aspects that might affect implementation of the program	Control of disruptive factors	Qualitative	✓	✓

**Table 3** Process evaluation of elderly integrated nutrition–care program (clients' perspectives, n=256)

	Answer	n	%	Target
<b>Reach</b>				
Visiting sessions of clients to the health-care center to receive any type of services available (not just nutritional) in the last year (visit number)	Never One Two More than two	20 51 59 126	7.8 19.9 23.0 49.2	At least one session
Client follow-up by telephone in the last year	Yes No	206 30	87.3 12.7	Yes = 100%
Attending the face-to-face nutrition-education meetings in the last year (number of sessions)	Zero One Two More than two	38 50 69 79	16.1 21.2 29.2 33.5	Depending on clients' health status
Attending the group nutrition-education sessions in the last year (number of sessions)	Zero One Two More than two	38 117 63 18	16.1 49.6 26.7 7.6	More than two
Attending physical activity sessions in the last year (number of sessions)	Zero One Two More than two	141 70 18 7	59.7 29.7 7.6 3.0	More than two
Attendance for body-weight and blood-pressure measurement in the last year (number of sessions)	Never One Two More than two	21 51 68 96	8.9 21.6 28.8 40.7	At least one

reported that the service was not delivered. The rest reported receiving one (21.2%), two (29.2%), or more than three (33.5%) sessions. Depending on the individual's

condition, the optimal meeting time for nutritionists for these program meetings was 20–40 minutes.<sup>24</sup> The vast majority (83.3%; n=165) of clients attending these

**Table 4** Process evaluation of elderly integrated nutrition–care program (clients' perspectives, n=256)

	Answer	n	%	Target
<b>Exposure</b>				
Clients' awareness of availability of nutrition-care services at nearby health-care center	Yes No	183 53	77.5 22.5	Yes = 90%
Clients' awareness of time and place of conducted group nutrition-education sessions	Yes No	206 30	87.3 12.7	Yes = 90%
Clients' awareness of available physical activity sessions	Yes No	187 49	79.2 20.8	Yes = 90%
Available information system	TV or radio Social media Telephone calls Friends and neighbors	10 56 122 18	4.8 27.2 59.3 8.7	Mostly telephone calls
Clients' awareness of contents of posters or pamphlets	Yes No	156 80	66.1 33.9	Yes = 90%

meetings reported that the duration of the session was <20 minutes. Nearly half the clients (50.2%) had a long wait before receiving service. Most of them (92.4%) found the nutritionists to be well motivated, but only 30.6% (n=37) had high satisfaction with this service.

Table 7 shows barriers to implementation of the EINCP from the providers' perspective. In all, over three in four (77.6%, n=59) of the providers stated that the limited time for face-to-face nutrition-education meetings was due to the high number of referrals. A total of 78.9% (n=60) also believed that some early caregivers did not properly assess the health status of referred clients nor pay enough attention to convince the elderly in need of nutrition education to be referred to the nutritionist. Three in four (76.3%; n=58) providers did not have an appropriate space for face-to-face education meetings, and 67.1% (n=51) did not have nutritionists stationed in the health-care center, which greatly affected attendance of clients at face-to-face nutrition-education meetings. Also, 89.4% (n=68) of providers believed that elderly clients preferred to use available nutrition services in specialized clinics as an alternative to health-care centers.

## Group Nutrition-Education Sessions

According to the EINCP, group nutrition-education sessions should be conducted once a week at a specific place and time in each health-care center, as well as in other public places, such as mosques and parks. The suggested duration and number of participants for these classes is

60–70 minutes and 11–20 persons, respectively. Every elder should participate in at least three group nutrition-education sessions. The package of instructions for these sessions is shown in Table 8.

Just 7.6% (n=18) of clients reported that they had participated in all three sessions, although 87.3% (n=206) had been exposed to these sessions. Of the clients participating in the sessions, 21.6% (n=51) stated that the number of participants in these group sessions was more than eleven. Most clients (86.0%) reported that the duration of the sessions was less than an hour, considered inadequate. On the other hand, 95.4% (n=189) of the clients reported that the content of the group nutrition-education sessions was simple, understandable, and attractive. Almost half (43.6%; n=103) the clients stated that these sessions were also conducted in public places, such as parks and mosques.

Providers were enthusiastic about the elderly group nutrition-education sessions, though 32.9% (n=25) reported not having enough time to fulfill their assigned tasks, as they provided health-care services to other age-groups at the same time. Over half (52.6%; n=40) pointed out that the lack of elder attendance and their low motivation in these sessions led to disruptions in holding timely and weekly sessions. Furthermore, lack of a separate education meeting room, inability of clients to attend at the health-care centers, and low literacy of clients were other barriers that affected adherence of clients to these sessions.



**Table 5** Process evaluation of elderly integrated nutrition–care program (clients' perspectives, n=256)

	Answer	Target	Item	Answer	Target	Item	Answer	Target
<b>Delivery</b>								
Opening private health files for clients in the last year	Yes (n=225, 95.3%)	Yes = 100%	Client presence at every group in nutrition-education sessions (number of participants)	<4 (n=33, 14.0%)	11–20 persons	Received nutrition-related pamphlets	Yes (n=143, 60.6%)	Yes = 100%
	No (n=11, 4.7%)			5–10 (n=152, 64.4%)			No (n=93, 39.4%)	
				>11 (n=51, 21.6%)				
Free calcium supplementation (500 mg/day) and multivitamin supplementation	Yes (n=0)	One/day calcium and one/day (for elderly with BMI <22)	Average session duration of every group in nutrition-education sessions (minutes)	<30 (n=55, 23.3%)	60–70 minutes	Received physical activity-related pamphlets	Yes (n=163, 69.1%)	Yes = 100%
	No (n=256, 100%)			30–60 (n=148, 62.7%)			No (n=73, 30.9%)	
Nutritional status follow-ups in the last year (number of sessions)	Zero (n=65, 27.5%)	At least one	Regular nutrition-education sessions	>60 (n=33, 14.0%)	Yes = 100%	Duration of every physical activity sessions (minutes)	<45 (n=39, 26.9%)	45–60 minutes
	One (n=16, 6.8%)						45–60 (n=80, 55.2%)	
	Two (n=46, 19.5%)					Conducting physical activity sessions	>60 (n=26, 17.9%)	
	More than two (n=109, 46.2%)							
Free vitamin D supplementation (50,000 IU/month; number of received pearls in last year)	Zero (n=99, 41.9%)	12 pearls	Regular physical activity sessions	Yes (n=70, 73.7%)	Yes = 100%		Weekly (n=13, 5.5%)	Weekly = 100%
	One (n=27, 11.4%)			Later than the due time (n=17, 17.9%)			Monthly (n=108, 45.8%)	
	Two (n=52, 22.0%)			Unstable place (n=8, 8.4%)			Yearly (n=23, 9.7%)	
	More than two (n=58, 24.7%)							

## Physical Activity Sessions

It was found that 40.3% (n=95) of clients had participated in PA sessions within the last 12 months (EINCP goal 60%). The exposure rate of clients to these sessions was 79.2%. In all, 73.7% (n=70) of them reported that they had not had enough motivation to participate in the PA sessions. Only 5.5% (n=13) stated that the sessions were conducted periodically. The expected duration of every PA session was 45–60 minutes, and over half (55.2%; n=80) the clients observed this. Almost all (94.2%) reported that the format and intensity of the PA sessions were compatible with their ability. However, only

13.2% (n=16) had high satisfaction with these sessions. Providers believed that low adherence of clients to PA sessions was due to an inefficient information system (77.6%, n=59) and to weather conditions (23.7%, n=18).

## Notification Framework for the Elderly

The staff of the health-care centers are responsible for regularly informing elders about ongoing programs via telephone. Most clients (87.3%, n=206) had received telephone calls from health-care centers with information on how to use their health services. Telephone (59.3%) and



**Table 6** Process evaluation of elderly integrated nutrition–care program (clients' perspectives, n=256)

	Answer	n	%
<b>Fidelity</b>			
Motivation of nutritionist for face-to-face nutrition education meeting	Yes	183	92.4
	No	15	7.6
Motivation of nutritionist for group nutrition-education sessions	Yes	192	97.0
	No	6	3.0
Motivation of coaches for physical activity sessions	Yes	89	93.7
	No	6	6.3
Simple and understandable nutritional contents	Yes	189	95.4
	No	9	4.6
Quality of received pamphlets	Useful	122	84.1
	Not useful	23	15.9
<b>Satisfaction</b>			
Clients' long waiting-time complaints for face-to-face nutrition-education meetings	Yes	106	50.2
	No	105	49.8
Matching forms and intensity of physical activity to client's ability	Yes	129	94.2
	No	8	5.8
High satisfaction of clients with every available EINCP service	Group nutrition-education sessions	26	21.5
	Face-to face nutrition-education meetings	37	30.6
	Physical activity sessions	16	13.2
	Body weight and blood pressure-measuring service	42	34.7
	Supplementation service	10	4.2
	Overall program	101	42.8
Sufficiency of available nutritional services for clients' needs	Yes	185	86.0
	No	30	14.0
Devoting adequate time to clients by providers	Yes	178	86.8
	No	27	13.2
Clients' satisfaction with performance of program providers	High	138	58.5
	Medium	72	30.5

social media (27.2%) were the most frequently used methods to inform participants of the nutritional services of the health-care centers. Providers stated that some barriers greatly affected their telephone-contact success. For instance, 32.9% (n=25) of providers had failed to receive a response from clients in the last year, and 96.0% (n=73) had not had have enough time. In addition, 80.3% (n=61) reported that the presence of only one landline in the health-care center interfered with their assigned tasks.

**Table 7** Barriers to implementation of elderly integrated nutrition–care program (providers' perspectives, n=76)

	Extracted barriers	n	%
Low adherence of clients to face-to-face nutrition-education meetings	Poor cooperation of early caregivers with nutritionists	60	78.9
	Inappropriate space for face-to-face education	58	76.3
	Lack of a stationed nutritionist in a specific health-care center	51	67.1
	Preference of clients for using specialized clinics	68	89.4
Low frequency of telephone calls to the clients	High diversity of health-care centers' clients	68	89.4
	Failure to respond	25	32.9
	Lack of time of providers	73	96.0
	Presence of only one landline in the health-care center	61	80.3
Low adherence of clients to group nutrition-education sessions	Lack of a separate educating room	24	31.6
	Inability of clients to attend alone	44	57.9
	Low literacy of clients	39	51.3
Low adherence of clients to physical activity sessions	Inefficient information system	59	77.6
	Weather conditions	18	23.7
Low duration of face-to-face nutrition-education meetings	High referrals	59	77.6
	Lack of time to devote to meetings	76	100
	Disregard of clients with regard to education	13	17.1
Low duration of group nutrition-education sessions	High demand of clients versus limited time	25	32.9
	High diversity of health-care centers' clients	63	82.9
Unregular education and physical activity sessions	Low-motivation clients	40	52.6
	Inadequate time of providers	69	90.8
Giving pamphlets to the elderly	Pamphlet deficiency	59	77.6
	Clients' illiteracy	16	21.0
Insufficient supplementation	Lack of provider-center support	76	100
	Lack of client referrals	61	80.3

## Program Follow-Up

Health-center staff are expected to provide monthly follow-ups for elderly with special needs and once a year for

**Table 8** Instructions for elderly group nutrition-education sessions

	Teaching method	Duration (minutes)
<b>First session</b>		
Brief introduction on educational topics	Identify the topics of each session, give a brief description of them, and conduct a pretest of the course	10
Importance of nutrition in old age and daily diet needs	Group discussion	25
Evaluation of elderly information	Questions and analysis of individuals' answers	15
Helping decision-making of participants to improve behaviors	Run group discussion and take a final test	20
<b>Second session</b>		
Review of educational topics and contents	Review the last session, introduce topics for second and third sessions, and take a simple test for start the course	10
Assessment of agreed target behaviors in last session	Ask one of the individuals to suggest a pattern	5
Nutritional needs of elderly (main food groups, dairy group, food-replacement table, target behaviors)	Run group discussion, use educational graphs, books, and food pyramid	25
Assessment of information obtained and conclusion on target behaviors	Questions and analysis of individuals' answers	10
Helping decision-making in the elderly to improve behavior	Run group discussion and take a final test	10
<b>Third session</b>		
Review of educational topics and contents	Review the last sessions, introduce topics for this session, and take a simple test for start the course	10
Assessment of agreed target behaviors in second session	Ask one of the individuals to suggest a pattern	5
Nutritional needs of elderly (protein group, carbohydrate group, fruit-and-vegetable group), sugar-and-fat group), food-replacement table, and target behaviors	Run group discussion, use educational graphs, books, and food pyramid	30
Assessment of information obtained and conclusion on target behaviors	Questions and analysis of answers	15
Helping decision-making in the elderly to improve behavior	Group discussion and final test	10

those without any disorders. Almost half (46.2%, n=109) the clients had monthly follow-ups. Regular body-weight and blood-pressure monitoring is another task of health-center staff. It was reported that 40.7% (n=96) of clients had regular checkups for body weight or blood pressure, while 8.9% (n=21) had never received this service.

## Posters, Banners, and Pamphlets

According to the EINCP, health-care centers should post banners and information media with the content of community health services in every neighborhood. Most clients (81.3%) did not notice the presence of any poster or banners in their neighborhoods. Nearly 60% of clients received nutrition and PA-related pamphlets in the classes. Further, 84.1% (n=122) mentioned that the pamphlets they received were

useful. Over three in four (77.6%, n=59) providers felt that the pamphlets were not delivered on time or in sufficient quantities to distribute, resulting in low delivery of this service. They stated that the banners' shapes and colors were not interesting enough to attract clients' attention. They also suggested designing the banners and pamphlets with more conceptual colors and shapes, suitable for the elderly population, especially for individuals who cannot read or write.

## Vitamin and Mineral Supplementation

The EINCP recommends health-care centers provide free supplements of vitamin D (50,000 IU/month) and calcium (500 mg/day) to all elders following examination by a general practitioner. The centers should also give multi-vitamin supplements to elders with BMI <22 kg/m<sup>2</sup>. In this

regard, just 24.7% (n=58) of clients had received vitamin D supplements in the last year. Only 4.2% (n=10) had high satisfaction with the supplementation service. Importantly, none of the clients had received free calcium or multi-vitamin supplements. From the provider perspective, 80.3% (n=61) reported that clients were not referred to them to take supplements. All providers stated that health-care centers did not have adequate financial support to provide the supplements.

## Overall Contextual Aspects Affecting the Program

Almost all participating providers (97.4%; n=74) believed that the main reasons for the shortcomings in providing high-quality and sufficient nutritional services to clients were late payment of staff salaries and the heavy workload assigned to them. Generally, since all staff members at health-care centers provide services for various age-groups within a limited time, it is not possible to focus just on elderly clients. Many health-care centers lack enough service space, a hindrance in responding simultaneously to the large number of clients. Interestingly, 65.2% (n=58) of clients stated that they did not have good access to the health-care centers.

## Discussion

The present study evaluated the process of EINCP implementation in Tabriz, Iran. We found that the program's overall reach and exposure rates of clients to the program were 20.0% and 77.5%, respectively, considered inadequate (program target 90%). Although the primary training sessions were largely delivered to providers as intended (100%), most planned services for clients were poorly implemented and had some important weaknesses. An overall low level of implementation fidelity was observed from perspectives of both clients and providers. The satisfaction rate of the clients with various parts of the EINCP was varied: 42.8% reported high satisfaction with the overall program. The program also suffered from some external barriers, such as lack of financial support of responsible centers.

The results of the current process evaluation illustrate that a main problem with the EINCP has been inadequate and irregular attendance of clients. The reported reach of the evaluated program (20%) was considered low. In line with our study, low reach has also been reported in other health-related intervention programs for the elderly.<sup>25,26</sup>

A health intervention for Brazilian elderly reported a reach of 17.2%.<sup>27</sup> Another study reported that low attendance of clients at nutrition-education and PA sessions was largely due to inadequate attention of trainers or coaches paid to activities of participants.<sup>28</sup> In the current study, some clients stated that the prescribed physical activities were not suitable for their health conditions and they sometimes experienced difficulties in carrying them out. In addition, they reported that the content of the education sessions was poor and did not meet their needs. In addition, the sessions were deemed were not informative or interesting enough, as most clients stated that they were unwilling to participate in the sessions due to low motivation. As such, it is suggested that customized support for each elder individual should be taken into consideration in order to promote the presence of older adults in education and PA sessions at the health-care centers. The low availability of health-care centers for the elderly was another factor affecting the reach of the EINCP. The availability of locally accessible programs with quick and easy access for all target individuals is one of the main strategies helping providers to get closer to desired outcomes.<sup>29</sup> Policy-makers should design efficient programs to ensure that participants follow the intervention, and the program would gain in compliance.

Compared to the high delivery rate of the program to providers, program delivery to the clients had some shortcomings, as follow-up sessions, number and duration of nutrition-education and PA sessions, and vitamin or mineral supplementation did not go as planned. In contrast to the current study, process evaluations in Nigeria and the US have shown a delivery rate of 100%.<sup>30,31</sup> In the current study, several factors may have contributed to the low level of delivery, including insufficient time on the part of the providers and lack of attention to providers' specialties. It is speculated that poor delivery of the program components might have resulted in diminished EINCP effects, as confirmed by another study.<sup>32</sup>

Although all clients were familiar with the health-care centers of their resident area, 22.5% reported no exposure to the EINCP. In this study, the principal strategy to inform the elderly about the EINCP was telephone calls; however, this approach did not sufficiently raise awareness of the target group. There was no comprehensive information on nutritional services provided to the elderly, ie, many people regarded the health centers as a place to provide first-level services to children and pregnant women. Raising awareness of the target group about their needs is a key

plank of the public health approach to health care.<sup>33</sup> It is suggested that program providers invest in raising residents' awareness of the EINCP by using appropriate and varied methods.

Although 42.8% of clients were satisfied with the providers' performances and 58.5% were satisfied with overall EINCP services available, there were still some shortcomings in the satisfaction of the clients with some services, including education and PA sessions, as well as supplementation and follow-up sessions. A high percentage of providers were adequately motivated to their assigned tasks; however, they reported many barriers related to the program. Many providers had not received enough training in the field of elder care and reported not having adequate time. It is recommended that health centers use senior educated staff with more experience in elder care. It is also recommended to employ more related staff to meet the needs of the elderly.

## Conclusion

According to the findings of the current study, reach, exposure, and fidelity of the program and delivery of some services were not implemented as planned, resulting in a low level of client satisfaction. Fidelity of program implementation, especially education materials, should be revisited for quality enhancement, and more resources should be allocated to improve the delivery rate. Additionally, it is necessary to improve financial support to the responsible centers and to increase awareness among the elderly and their families. Strategies related to recruitment of the target population should be improved, in order to minimize the barriers highlighted in this study. These findings may be beneficial in guiding public health policy-makers to design and successfully implement national-level public health interventions in developing countries. It is vital to note the importance of considering the perspectives of both clients and providers to ensure the achievement of expected outcomes and impacts of any public health-intervention programs.

## Abbreviations

EICP, elderly integrated-care program; EINCP, elderly integrated nutrition-care program.

## Data-Sharing Statement

The data gathered and analyzed during the current study are available from the corresponding author on reasonable request.

## Ethics Approval and Consent to Participate

This study was performed in accordance with the Declaration of Helsinki. Informed consent was obtained from all study participants. The protocol was approved by the ethical committee of Tabriz University of Medical Sciences, Tabriz, Iran (IR.TBZMED.REC.1397.1018). The anonymity and confidentiality of participants were assured and their decision to participate voluntarily in this study respected.

## Acknowledgments

The results of this article are derived from the PhD thesis of the first author, registered at Tabriz University of Medical Sciences, Tabriz, Iran.

## Author Contributions

All authors made substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data, took part in drafting the article or revising it critically for important intellectual content, gave final approval to the version to be published, and agree to be accountable for all aspects of the work.

## Funding

This study was supported by financial assistance from Tabriz University of Medical Sciences, Tabriz, Iran. This funding organization covered the processes of data collection, analysis, and interpretation and writing of the manuscript.

## Disclosure

The authors report no conflict of interest.

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