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A Pilot Physical Activity Initiative to Improve Mental Health Status amongst Iranian Institutionalized Older People

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ABSTRACT

Background: Sufficient level of physical activity may promote overall and mental health of old people. This study was carried out to investigate the practicability of a physical activity promotion initiative amongst institutionalized older people in Tabriz, Iran.
Methods: Purposive sampling method was used in this semi-experimental study to recruit 31 older people living in a selected residential care in Tabriz. Moderate-intensity aerobic and muscle-strengthening activity was planned for those who had not severe baseline cognitive impairment or were not too frail to undertake the survey. The General Health Questionnaire (GHQ-28) was used to measure mental health status before and after intervention through a face-to-face interview. Descriptive statistics, Wilkcoxon rank-sum, Mann–Whitney U and Chi-Square tests were employed to analyses the data.
Results: The applied intervention was significantly improved status of physical health, anxiety and insomnia, social dysfunction and severe depression.
Conclusion: Incorporation of physical activity promotion programs into routines of older people residential care homes in Iran is feasible but may need training of physical activity specialists to work with older people based on their physical endurance and limitations.

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Introduction

The world population is getting old. This phenomenon is attributed to decreases in mortality rate which in turn results from advances in medicine and health care, birth control, and implementation of effective programs for older people to improve their physical, mental and social conditions.[1] As World Health Organization (WHO) estimated, approximately 688 million people aged 60 and older lived around the world in 2006 that will reach to 1.968 billion people in 2050.[2] In Iran, results of several surveys schemed that 25% to 30% of population will be above 50 by 2030.[3]

Concurrent with increase of elder people population, a considerable escalation in health and particularly mental problems are taking place worldwide. Health status of older people is one of the main concerns for policy makers in the modern world. Based on the estimation of WHO, 25% of the world population suffer from mental, behavioral and neurological disorders.[4] The prediction also suggests that the proportion of mental disorders to all known disease will rise from 10% in 1990 to 15% in 2020. The increase thus, will be even greater than that of cardiovascular diseases.[4] Iranian Ministry

of Health and Medical Education (MOHME) reported that 21% of the country's population in range of 15 and above have suffered from mental disorders in 2010.[5] All these evidence are implying that mental disorders will be a health care priority all over the world in the upcoming decades, so that, 4 out of 10 diseases leading to disability will be related to mental disorders.[6] Zauszniewski estimated that 12% of the American older people had severe depression in 2004.[7] A research in Qom province in the central part of Iran, indicated that 48% of elder people had depression, 86% were anxious, 8% had social dysfunction and 86% suffered from somatic disorders.[8]

The numbers of nursing homes for old people have increased recently and families are more willing to meet needs of their old people in these centers. Despite such a pattern institutionalized older people encounter a great deal of social problems particularly social deprivation.[6] The incidence of mental disorders among elderly nursing home residents was reported to be about 80% of which 12%-18% was indicated to suffer from depression.[9] Living conditions of participants play an important role in their health around their lifetime. While majority of interventions to diminish these disorders are involving medicine use, this approach may impose economic burdens to patients, supporting organizations, general health care system and wider society. A survey by the U.S Department of Health, Education and Welfare has revealed that 29% of medical expenses in this country are used to pay for older people medical needs, while only 12% of the population is aged 65 and over. It is also estimated that about 50% of medical expenses will be devoted to this age group by 2040.[9] Sixty percent of health care expenditures, 47% of hospitalization, and 35% of hospital discharges were associated to elderly people.[10]

It was shown that physical activity and exercise might have positive effect on mood and affect of elder people. A direct relation between physical activity and psychological well-being has been confirmed in several large-scale epidemiological surveys using various measures of activity and well-being. Physical activity can also reduce symptoms of anxiety, depression and foster improvements in mood and feelings of well-being.[11]

Amongst older people, regular and suitable physical activities such as walking, swimming, stretching and light exercises decrease the debilities, reduce the pain resulting from chronic diseases and help them to make friends and establish suitable relations in the community. Physical activity may also decrease feeling of loneliness and improves different dimensions of quality of life.[8-12]

Inactivity among elderly people could cause depression, anxiety and chronic diseases.[13-18] This is while based on the research evidence a sizable number of seniors do not take part in regular exercise programs or do not exercise consistently.[19,20]

This study was carried out to examine the possibility of conducting pilot physical activity initiatives in Iran to improve mental health status amongst Iranian institutionalized older people. Effects of the intervention on elder people's general health were also scrutinized.

Materials and Methods

Participants and procedures

This study was a semi-experimental research conducted from February to July 2012 in which through application of purposive sampling method all 31 older people living in a typical residential care center in Tabriz were selected from a total of 33 registered residents. The exclusion criteria included having severe cognitive impairment or being too frail to undertake the survey. Based on physical activity guidelines for older adults[18,21], moderate-intensity aerobic and muscle-strengthening activity were planned for the residents. A face-to-face interview was conducted by using the General Health Questionnaire (GHQ-28) (which was validated for Iranian population, Cronbach's alpha= 0.86)[22] to measure mental health status before and afterintervention. Descriptive statistics, Wilkcoxon rank-sum, Mann–Whitney U and Chi-Square tests were em-

ployed where appropriate to describe and analyses the data.[23] By using Statistical Package for the Social Sciences (version 17) , for all tests the alpha level for statistical significance was regarded as P = 0.05.

General Health Questionnaire

Goldberg and Hillier's 28-items scaled version of the General Health Questionnaire (GHQ-28) has been used to measure the psychological aspect of quality of life. The GHQ-28 includes four subscales: somatic symptoms, anxiety and insomnia, social dysfunction, and severe depression. The existence of four subscales permits analyses within the subscales and this is an additional advantage of the GHQ-28 scale over the other versions. Scores' range is from 0 to 84. Higher scores indicate a greater probability of a psychiatric distress.[22]

Initiative process

A face to face educational session was planned and implemented about the advantages of physical activity and the disadvantages of inactivity for the study target group. Then all participants were asked to interact with each other in order to set up a regular and active physical activity program. Using peer education approach, older people helped each other promoting how they could be more active in residential care home. Participants were asked to stretch their hands and legs for 5-10 minutes, warm-up, and walk slowly for 1-2 minutes and walk fast for 5-10 minutes. Then they walked in different directions, ran slowly, and moved their heads and hands 3-4 times. This stage lasted 15- 20 minutes. The program was finalized by stretching motions which lasted 3-5 minutes.

During the exercise, the participants' favorite music was played to avoid a boring environment and they were provided by a soft drink to maintain their body water and electrolyte supply.

The program started with maximum increase of 30-40% in the normal heart rate in the first week and then it gradually increased until the rise of heart rate reached to above 40-60% higher level than the normal level at the end of the program. This program was implemented for 30-40 minute 3 times a week for 2 months.

Ethical considerations

The hazards or difficulties that might arise for the participants in relation to type of activities they were asked to do, their safety in the study location and their informed consent to participate in the study were considered and all efforts were taken to secure the study participants rights. Basic ethical principles such as giving choice for the study target group to withdraw from investigation at any time without obligation to give a reason and keeping their personal information confidential were also observed.

Results

Demographic characteristics of the sample

The characteristics of the 31 participants including their gender, age, marital status, family size, educational level and residency period were shown in Table 1. As indicated 58% of participants were male, 13 (42%) were aged 60-69 years, 10 (32%) aged 70-79 years, and 8 (26%) aged 80 or more years. In relation to marital status 55% (n=17) reported themselves as being widowed, 26% never married, 16% married and just 3% divorced respectively. Concerning family size, 32% of the participants (n=16) were living alone. Majority of the participants were illiterate (61%), while, educational level of remaining ranged from primary/secondary to post-secondary level. Regarding duration of their stay in the residential care center 42% of the older people reported that they have left their own home 1-5 years ago. Although no statistical assumption could be made for non-probability driven samples but in order to discuss probable effect of physical activity promotion in the elder people of residential care home, parametric and non-parametric method was used where appropriate to compare the general health status score before and after intervention.

Table1: Socio-demographic characteristics of participants (n=31)

Characteristics		n (%)
Gender	Female	18 (58)
	Male	13 (42)
Age group (yr)	60-69	13 (42)
	70- 79	10 (32)
	80 and over	8 (26)
Marital status	Widowed	17 (55)
	Single (never married)	8 (26)
	Married	5 (16)
	Divorced	1 (3)
Number of children	1-3	16 (52)
	Without children	10 (32)
	More than 3	5 (16)
Educational level	Illiterate	19 (61)
	Primary/secondary	10 (23)
	College/university	2 (6)
Residential period	1-5 years	13 (42)
	More than 5 years	10 (32)
	Less than one year	8 (26)

Pearson's chi-squared tests revealed that there were no significant differences between females and males regarding their length of stay in residential care centers, educational level, marital status, and number of children.

Associations between subgroup of socio-demographic characteristics and the General Health Questionnairescale were examined using Paired-samples *t*-test. Interestingly, scores were significantly different in all subgroups before and after intervention (*P* values were less than 0.05 for all tests).

Results of the GHQ-28 scale (before intervention)

Descriptive results of the GHQ-28 application revealed that the range of scores was 7-52 with median of 23. Post- intervention application of the questionnaire was indicated that the halth status score range was 1-31, with median of 7 (Table 2).

Subscale analysis of the findings from GHQ-28 application in the study target group (pre and post-intervention), median score and standard deviation of findings in four dimensions of GHQ were also presented in Table 2.

The association of physical activity initiative and mental health status

Exercised Wilcoxon signed-rank test showed that GHQ-28 scores were significantly different pre and post-intervention (Table 2) in all dimensions of health amongst the intervened people.

Table 2: The association of physical activity initiative and mental health status using Wilcoxon signed-rank test

Aspects of mental health	Pre and post- intervention	Median (P25-P75)*	Z	P-Value
Somatization	Pre- intervention	3 (1-4)	-4.14	<0.001
	Post- intervention	1(0-2)		
Anxiety and sleep disorder	Pre- intervention	7(3-10)	-4.25	<0.001
	Post- intervention	2(1-4)		
Social dysfunction	Pre- intervention	7(5-9)	-4.17	<0.001
	Post- intervention	3(2-4)		
Depression	Pre- intervention	5(2-9)	-4.23	<0.001
	Post- intervention	2(1-2)		
Overall Score	Pre- intervention	23(16-30)	-4.27	<0.001
	Post- intervention	7(5-11)		

***P25: 25th Percentile, P75: 75th Percentile**

Discussion

The results of the present study showed that implementation of eight weeks of physical activity enhancement program caused a great improvement in mental health status of the elderly people. Greatest impact of our implemented intervention was in reduction of anxiety and depression level.

Our results are consistent with the findings of Liang's study in 2007, where exercise and physical activities could postpone and prevent incidence of mental disorders in elderly; the oldsters who had more physical activity were more vivacious and mentally healthy.[24] An assessment of the relation between physical activity and ill-favored thoughts, committing suicide and insanitary behaviors of 1870 people revealed that physical activity can be used as efficient tool in health promotion programs.[25]

People suffering from psychopathic problems are frequently reported to be more susceptible to various kinds of physical diseases which are partly related to lack of physical activities. Increased mortality resulting from cardiovascular disease, diabetes and dyslipidemia could be referred to lack of physical activities.[26-30] Common physical complaints by elder people include feeling sick, need for drug, faintness, indolence and headache. We showed that physical activity promotion in elder people could significantly decrease their physical symptom. Brachet et al.[31] have revealed that old people who exercised for 20 to 30 minutes most of the days of the week had better function than inactive people. They stated that every kind of physical activity was better than inactivity, however regular exercise had more advantages. This finding are persistent with results of Adams[32] and Matheret's studies[33] but not with the results of Ferdousi et al.[34] in which they have concluded that exercise could not decrease physical complaints of the old people. This may be resulted from differences in the type of activities programmed for the elder people, their age or general physical health status of the studied individuals.

Insomnia, feeling of tension and stress, irritation and bad temper and fear without any reason are all symptoms of anxiety.[35] The present study indicated that exercise has noticeable effect on anxiety cut down and this result is in agreement with the outcomes of other research including those of Meyer and Broocks,[36] Ussher,[37] Fulks[38] and Guszhowska.[39] In a research conducted on 319 elder males and 403 females, pattern of sleep of people after physical activity was shown to be better in comparison with inactive people. Feeling of tiredness the day after suitable sleep also was shown to be lesser.[40,41] The study of Kubitz also showed that sufficient physical activity could result in significant enhancement of the general sleep pattern of old people.[42] This is while; some research evidence suggested that physical exercise could not lower the level of anxiety in old people.[43] This may be due to the study population's circumstances including social status, economical condition, activity type, physical conditions and age rather than the ineffectiveness of regular physical activity of older people in improvement of mental status per se.

Social function disorders consist of inability in entertaining yourself, inability in doing affairs well, activity dissatisfaction and decision making problems. The results of the present study were shown a significant decrease in social dysfunction symptoms following two months of exercise. Unlike findings of the studies conducted by Sagatun,[44] Ahmadi,[45] and Mogharnasi,[46] the results highlighted the positive effect of exercise on social performances and physical symptom improvement.

Depression in the elderly appears in the forms of tiredness, lack of concentration, repetitive waking up, poor appetite, physical pains, impatience and inactivity.[47] The comparison of pre-test and post-test means of depression scores in old males and females showed that physical activity had a noticeable effect on decreasing depression symp-

toms in the studied group too. The outcomes of this research are in agreement with the results of Brosnahan[25] and Harvey.[48] Aerobic physical activities have anti-depression effects and they prevent harmful and undesirable consequences.[49-51] The impelling factor to observe such an association may be increase of the level of serotonin, epinephrine and opioids during the activity or exercise which in turn decreases depression.[52] Such a reverse relationship was not observed in the Goodwin's[53] and Soltanian's[54] studies. There are many background factors that could potentially affect the mental health status of elder people or relationship between variables in a single study. Though, the conflicting results in relation to the effect of regular physical activity in old people on their depressive conditions may result from non proper control of confounding factors in some studies.

This study has its own limitations. We were not able to control some contextual factors e.g. economic status of the study participants and their normal life events that may have potential effect on the mental health of the study respondents. We also were not able to follow the study participants for a long time to see the effect of our intervention in an acceptably long period of time.

Conclusion

To conclude, this study concurrent with the findings of many other researches[55-57] were indicative of a positive effect of moderate level of physical activity on mental health of elder people. Such an effect was evident in the form of less depression, anxiety and social dysfunction.[57-59]

This overall conclusion was driven despite findings of a number of studies[60-63] that indicated no relationship between physical activity levels and mental health status amongst oldsters.

Practical interpretation of our study's findings to be considered by policy makers and researchers could be as follow:

1. Programming and implementation of physical activity enhancement programmes in residential care home for the elderly people is feasible in Iran.
2. There are unmet needs amongst institutionalized older people that may negatively affect their health and quality of life. A part of these unmet needs is about required physical activity level.
3. Other positive effects of regular physical activities on the general health of the elderly people including self-confidence, reductions in somatic disorders and degenerative psychological disorders must be investigated in future studies.
4. Physiological and biochemical path of effects that physical activity may have on old people must be scrutinized to have better understanding about pros and cons of different level and type of physical activities on old people.

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Competing interests

The authors declare that there is no conflict of interest.

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