

Investigations on the physical activity level of some Iranian drug suicidal patients

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ABSTRACT

As it is important to use the preventive and therapeutic effects of exercise and physical activity in the management of suicidal patients, we primarily need to know physical activity level of suicidal patients. However there are little data in this topic. The females to male ratio of patients were about 2.1:1. with the average age of 29.7, minimum 13 and maximum 88 years, with standard deviation of 12.1. Physical activity level of majority (76.4 percent) of patients was in the range of low (less than 600 Metabolic equivalent/minute per week). Other variables except sex were not associated significantly with the physical activity level of patients. Physical activity level was significantly lower in females than males ($P = 0.001$, Chi square test). Low physical activity level and female sex are possible risk factors for drug suicidal attempts in Iranian patients.

KEY WORDS: EXERCISE, MENTAL HEALTH, PHYSICAL ACTIVITY, POISONING, SUICIDE

INTRODUCTION

Suicide is a global public health problem. Annually, almost 1 million people die in suicides worldwide (Turecki et al. 2015). The global suicide rate in 2008 was about 11.6 per 100,000. However, suicide has an increas-

ing incidence and it is estimated to be for more than 2% of the global burden of disease by the year 2020 (Behmanesh Poor et al. 2014). Demographic, social, and cultural factors can affect suicidal epidemiology (Mirhashemi et al. 2016). As suicide is condemned in Islam, the suicidal rate is low in most Islamic countries,

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yet it has shown to have increasing rate in recent years (Pritchard *et al.* 2007). According to the last WHO report, the reported suicide rates in Iran per 100,000 was 5.3 in both sexes: 3.6 in females and 7.0 in males (Mirhashemi *et al.* 2016) but figure nearly 2 times greater for average suicide rate (9.9 per 100,000) was measured based on data elucidation (Hassanian-Moghaddam *et al.* 2017). Suicide and attempted suicide rates in Iran increased from 8.3 per 100,000 in 2001 to 19.4 in 2005, then declined to 16.3 in 2007 (Saberi-Zafaghbandi *et al.* 2012). However, the officially reported figures for suicide are lower than what really occurred (Malakouti *et al.* 2015). Suicide with drug and self-immolation are two most common reported methods of suicide in Iran (Nazarzadeh *et al.* 2013, Poorolajal *et al.* 2015).

Physical training and an active lifestyle have been used as major public health tools in the prevention and treatment of many physical diseases including cardiovascular and metabolic diseases (Peluso *et al.* 2005). Also, the effects of exercise on the brain, cognitive function, and behavior have been of interest (Deslandes 2014). Based on several epidemiological studies, it has been shown that exercise and physical activity can have preventive or delaying effects on the onset of different mental disorders, and also can be used as therapeutic tools solely or in adjunct with other treatments for mental disorders (Zschucke *et al.* 2013). About 90% of individuals who had successful suicide had an identifiable psychiatric disorder before death (Arsenault-Lapierre *et al.* 2004) and at least 50% of suicide deaths are related to depressive episodes, either as major depressive disorder or bipolar disorder (Holma *et al.* 2014). In a Cochrane review which compared exercise intervention with no treatment, or with standard interventions (cognitive therapy and pharmacotherapy) in the management of depressive symptoms, a moderate clinical effect was found for exercise, which indicated that exercise was as effective as these standard treatments (Rimer *et al.* 2012). In a recent cross-sectional study which examined the relationship between suicidal thoughts (ST) and suicidal attempts (SA) and the level of physical activity (PA) among South Korean adolescents, there was an inverse dose-response relationship between the level of physical activity (defined as vigorous, moderate, and low) and ST and SA (Cho 2014). Also, in urban areas of the Iran, suicide is more common than rural areas (Shirazi *et al.* 2012). The cause of higher rate of suicide in cities may be related to lifestyle factors including more stress and lower physical activity level which can be the result of air pollution (Hajian *et al.* 2015).

Hajain *et al.* (2015) compared with those in rural areas. As it is important to use the preventive and therapeutic effects of exercise and physical activity in the management of suicidal patients, we primarily need to know physical activity level of suicidal patients in Iran.

There is no data on the physical activity level of suicidal patients in Iran. So, the aim of the present study was to investigate physical activity level of drug suicidal patients in a referral hospital of poisoning management in Tehran.

MATERIAL AND METHODS

In the current cross-sectional study, the Persian-translated long form interview-administered International Physical Activity Questionnaire (IPAQ) was used for assessing physical activity level of 406 drug suicidal patients who were admitted to poisoning ward of Loghman Hospital (the next morning after admission) between December 2014-April 2015. The validity and reliability of this version of IPAQ have already been proven in Iranian sample of individuals (Vasheghani-Farahani *et al.* 2011). After obtaining the consent form, interview was conducted by an expert with alive drug suicidal patients who had good consciousness level and cooperation or with close relatives of the patients who were informed about the physical activity habits of the patients. The results were expressed as low (less than 600 metabolic equivalent (MET). minute per week), medium (between 600 to 3000 MET. minute per week), and high (more than 3000 MET. minute per week) level of physical activity. Also, the patients were asked about their age, weight, marital and educational statuses, number of children, absence or presence, and in this case, the type of background mental disorders, the history and the number of previous suicide attempt(s). The data was then analyzed using SPSS (v. 16) and related statistical tests (ANOVA test for quantitative and Chi square test for qualitative variables).

RESULTS

Totally, 406 patients were evaluated: 278 females (68.4%) and 128 males (31.6%) with the average age of 29.7, minimum 13 and maximum 88 years, with standard deviation of 12.1. The average weight of patients was 64.8 kilograms, minimum 37 and maximum 145 kilograms, with standard deviation of 15.6. Other epidemiologic characteristics of patients are provided in Table 1. A total of 310 patients (76.4%) had low physical activity level, 80 patients (19.7%) medium, and 16 patients (3.9%) had high physical activity level. There were no significant differences in weight, number of children, and suicide history, marriage and educational status between patients with different physical activity levels (p value more than 0.05). There was significant difference in terms of different physical activity levels between the two sexes (p value = 0.001), which means females in low

Variable	Description	Number	Percent
Marriage status	Single	187	46.1
	Married	202	49.8
	Divorce	17	4.2
Number of children	0-1	320	79
	2-3	71	17.5
	More than 3	15	3.5
Education	Up to Diploma	305	75.1
	Diploma to BSc	86	21.1
	MSc and higher	15	3.6
Mental disorder (according to patient's statement)	No disease	317	78.1
	Depression	52	12.8
	Anxiety	3	.7
	Psychosis	2	.5
	Bipolar	4	1.0
	Other	20	4.9
History of suicide	0	245	60.3
	1	70	17.2
	2	15	3.7
	3	14	3.4
	4	5	1.2
	5	4	1.0
	6	3	.7
7	1	.2	

physical activity group had relatively higher percentage than their male counterparts and males in moderate and high physical activity groups had relatively higher percentage than their female peers.(Table 2).

DISCUSSION

According to the findings of the present study, from among 406 drug suicidal patients admitted to Loghman

		Physical activity Level			Total
		low	moderate	high	
Sex	<i>female</i>	224	49	5	278
	Percent	80.6%	17.6%	1.8%	100%
	<i>male</i>	86	31	11	128
	Percent	67.1%	24.2%	8.7%	100%
Total		310	80	16	406
	Percent	76.4%	19.7%	3.9%	100.0%

Hospital, the majority (76.4% percent) had low physical activity level. In a randomized cross over trial in high-level suicide risk patients, regular endurance training in the form of mountain hiking was shown to reduce hopelessness, depression, and suicide ideation (Sturm et al. 2012). Moreover, the moderate level of evidence has been reported for the inverse dose-response relationship between mental disorders (depression and distress) and physical activity level in the latest guideline for exercise testing and prescription of American College of Sports Medicine (ACSM) (Ferguson 2014).

The mechanisms whereby exercise and physical activity induce positive psychological health are diverse and complex. Broadly, it can be divided into reducing stress response, minimizing excessive inflammation, and enhancing growth factor expression and neural plasticity. Physical fitness, achieved through regular exercise and/or spontaneous physical activity blunts stress reactivity, protects against potentially adverse behavioral and metabolic consequences of stressful events of life (Silverman et al. 2014).

Physical activity level of the patients of the preset study was measured by IPAQ includes both physical activity and exercise, i.e. a type of physical activity that is planned, structured, repetitive, and purposeful (Carek et al. 2011). Although much of the research on positive psychological effects of exercise has been done on aerobic exercise, resistance exercise or strength training can also induce many physiological and psychological advantages. Increase in cognition and self-esteem, and decrease in depression and anxiety after both single-bout sessions and long-term resistance training have been identified in growing body of literature (Strickland et al. 2014). Also there are evidences that indicate that outdoor physical activity interventions such as mountain hiking, stimulates higher positive and lower negative affective responses compared to an indoor physical activity condition(Niedermeier et al. 2017).

In our study, the majority (68.4 percent) of drug suicidal patients were female. Also, the female to male ratio was higher in low physical activity level group. These sexual differences have been seen in the previous studies (Esteghamati et al. 2011, Koohpayezadeh et al. 2014), as well, and may be due to Iranian cultural and social backgrounds which encourage men to be more physically active compared with women.

The most common underlying mental disorder in our study was depression. Depression was also found in other studies as a risk factor for suicide and suicidal thought and self-destructive behavior in Iranian people (Ekramzadeh et al. 2012, Dabaghzadeh et al. 2015). It has been reported that the risk of suicide is increased by more than 50 percent in depressed individuals and it is about 20 times that of the general population in people

with major depression (Baek et al. 2015). There is now compelling evidence that lifestyle factors including diet, physical activity and exercise, relaxation and meditative techniques, quality of sleep, environmental pollutants, and social support are significant in the pathogenesis and treatment of depression; moreover, epidemiological studies have shown that low physical activity can be a risk factor for the development of depressive symptoms and that regular physical activity in early years of life is linked with reduced risk of experiencing depression in adulthood (Sarris et al. 2014).

Therefore, prevention of depression and other mental disorders by doing regular physical activity and exercise is a cost-effective approach for people who experience higher rates of mental illness compared with the general population. Indeed, mandatory physical exercise for the prevention of mental illness has been proposed for medical students in USA (Bitonte et al. 2014) as high prevalence of depression and anxiety has been reported among USA and Canada medical students, with levels of overall psychological distress indicators consistently higher than that in the general population and age-matched peers (Dyrbye et al. 2006). This approach can be used in the public suicide prevention programs too, as exercise has been shown to improve stress management ability, general feelings of well-being, and self-esteem and can act as a nonspecific psychological therapy (Kaminsky et al. 2006).

CONCLUSION

Low physical activity level and female sex are possible risk factors for drug suicidal attempts in Iranian patients. More precisely designed studies are needed to evaluate the relationship between physical activity and suicidal attempts in females. Promotion of increasing physical activity and exercise for patients at risk of suicide especially females, are recommended.

LIMITATIONS

The study was done in a drug poisoning management center and suicidal patients with causes other than drug poisoning were not included. Also the cases were alive patients and the dead ones were not included.

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CONFLICT OF INTEREST

There is no conflict of interest.

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