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Sari, Sengül; Bilberg, Randi Marie; Nielsen, Anette Søgaard; Jensen, Kurt; Larsen, Josefine Pilegaard; Roessler, Kirsten Kaya

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Physical Activity Patterns in Patients with Alcohol Use Disorder

Sari S^{1,2*}, Bilberg R², Søgaard Nielsen A², Jensen K³, Pilegaard J¹, Roessler KK¹

¹Department of Psychology, University of Southern Denmark, Denmark

²Unit of Clinical Alcohol Research, University of Southern Denmark, Denmark

³Department of Sports Science and Clinical Biomechanics, University of Southern Denmark, Denmark

***Corresponding author:** Sengül Sari, Department of Psychology, University of Southern Denmark, Campusvej 55, 5230, Odense M, Denmark, Tel: (+45) 21 37 95 25; Email: ssari@health.sdu.dk

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Abstract

Aims: The aim of this article is to assess baseline physical activity patterns in patients with alcohol use disorders (AUD). It examines the relationships between physical activity and alcohol consumption among patients with AUD.

Methods: The study sample consisted of 119 consecutive patients, hereof 85 men. The International Physical Activity Questionnaire (short form) is used for assessing patterns of physical activity in participants. The Time-line-follow-back method is used for assessing alcohol consumption. Descriptive analysis and logistic regression analyses are conducted.

Results: At the time for initiation of treatment for alcohol use disorder, participants had performed vigorous physical activity (VPA) 1.6 days and moderate physical activity (MPA) 2.8 days of the last 7 days prior to treatment start. During the month prior to treatment start, the participants had 18 drinking days, and consumed a mean of approximately 50 units of alcohol per week. The proportion of the sample that reached minimum total physical activity guidelines was 80%.

Conclusions: AUD patients were mostly physically active. Alcohol use was not a predictor for physical activity.

Trial registration: Current Controlled Trials ISRCTN74889852. Registered 11 July 2013.

Keywords: Physical Activity; Alcohol Use Disorder; IPAQ; Baseline Assessment; Health Behaviour

Background

People with low education tend to be exposed to many risk factors over their life course like the stress of unemployment, unhealthy living with smoking and obesity etc., and additionally, some risk factors interact with each other – i.e. the health effect of one cause is stronger in the presence of another cause. That is why some people are more vulnerable – or less resilient – than others to the effects of adverse conditions. In other words, risk factors tend to cluster in sub-populations: Smokers tend to exercise less frequent than non-smokers, and unhealthy diet is often followed by other unhealthy lifestyle habits [1].

In the western societies, however, large alcohol intake seems to be a lifestyle factor that to some extent shows a slightly different picture than the above. For instance, prior research has indicated a positive relationship between physical activity and both alcohol consumption frequency and heaviness [2,3]. Hence large alcohol intake, and even an alcohol consumption above the recommended maximum limits seems to be relative common among sub-groups that in other respects are considered healthy and perform healthy lifestyles, like for example perform regular physical exercise.

The positive association between physical exercise and rather high alcohol intake may, however, disappear if the drinking exceeds a certain limit, just as individuals with lower socioeconomic status additionally may appear to be more vulnerable to tangible problems and consequences of alcohol consumption [4]. Alcohol use disorder (AUD) is a psychiatric disorder classified by the World Health Organization as either harmful use or abuse and dependency in the tenth version of International Classification of Diseases, ICD-10 [5]. Smothers and Bertolucci [6] found that heavy drinking was associated with declining physical activity and although Lisha et al. [7] found a positive association between physical activity and less severe forms of AUD (abuse), they also found that severe forms of AUD (dependence) were associated with lacking physical activity. Prior research has, however, not fully investigated physical activity patterns in a clinically diagnosed sample of individuals with AUD, but mostly focused on health behaviours of college students or in general population studies [2,3].

Physical activity is widely considered as protective against development of non-communicable lifestyle diseases, and it has even been proposed that physical activity may play a protective role in developing substance use [8] and promote physical and mental health in individuals with alcohol use disorder (AUD) [9]. A recent Danish study found that being sedentary in leisure time was a risk factor for developing an alcohol use disorder, such that low or moderate/high leisure-time physical activity was associated with almost half the risk of developing alcohol use disorder compared with a sedentary leisure-time physical activity [10]. Some earlier studies indicate that physical activity may be useful in the treatment of AUD [11-13]. Therefore, there is a need to investigate the physical activity behaviour in clinically diagnosed treatment seeking individuals with AUD, and whether alcohol use is associated with their physical activity levels. It is well documented that alcohol use is one of the largest health risk factors, as it substantially contributes to the global burden of disease. More precisely, alcohol contributes to 4% of total mortality and between 4% and 5% of disability-adjusted life-years [14]. This makes alcohol a serious but avoidable risk to the public health. Furthermore, alcohol dependent individuals were found to have an increased risk of all-cause mortality compared to the general population [15], which potentially could be argued to be mediated through other health detrimental life style choices such as lack of physical activity. It is therefore worth investigating patterns of physical activity in patients with AUD, so that early intervention can be made if physical inactivity appears to be an additional health risk.

The present paper aims to describe the physical activity engagement of 119 Danish consecutive patients seeking treatment for Alcohol Use Disorder. The relationship between physical activity at treatment start and alcohol use prior to treatment start will also be investigated.

Methods

Design

The study is based on baseline data from consecutive patients enrolled in a randomized control trial (RCT), investigating whether additional physical exercise improves the effect of the treatment for alcohol use disorders [16].

Patients were consecutively invited to the RCT study at the time they initiated outpatient treatment and were enrolled in an exercise intervention where they were asked to complete a physical activity questionnaire. Informed consent and local ethics committee approval has been provided. A detailed report of the recruiting process, methods and interventions is published elsewhere [16,17].

Sample

Over a period of two years, 175 patients recruited from two outpatient alcohol treatment centres were enrolled in the RCT study. The patients were asked to complete the International Physical Activity Questionnaire (IPAQ) at treatment start. However, 56 patients did not return the questionnaire. Hence, the current study sample consisted of 119 consecutive patients. The IPAQ-completers and IPAQ-noncompleters did not differ in demographics or alcohol use; with the exception of alcohol problem severity expressed as Alcohol composite score (Table 1). The majority of the participants (82.2%) had alcohol dependency and the rest had harmful use of alcohol (17.8%), according to the International Classification of Diseases, version 10 (ICD-10). The patients did not have any other substance use disorder than alcohol use disorder.

	No IPAQ-data N=56 (32%) N (%) Mean(SD)	IPAQ-data N=119 (68) N (%) Mean(SD)	p-value Pearson χ^2 test
Males	37 (66.1)	85 (71.4)	0.47
Mean age (years)	45.7 (10.7)	44.8 (11.6)	0.64
Living with partner (yes)	15 (26.8)	44 (37.0)	0.18
Employed (yes)	32 (66.1)	66 (55.5)	0.83
Educated*)	36 (64.3)	88 (73.9)	0.19
Number of standard alcohol units/week**)	58.1 (45.6)	48.8 (43.6)	0.23
Alcohol composite score, according to the ASI***)	0.75 (0.20)	0.66 (0.22)	0.008

*) Educated: 0: No education after municipal primary and lower secondary school, 1: Technical or college education

**) A standard alcohol unit contains 12 grams pure alcohol

***) ASI: Addiction Severity Index

Table 1. Basic information on the patients seeking treatment for alcohol use disorder, who did or did not fill out the questionnaire on IPAQ.

Measures

Assessment of physical activity

The level of physical activity prior to the treatment start is measured by using the International Physical Activity Questionnaire (IPAQ) [18]. In this study, we used the short IPAQ form “last 7 days recall”, which is a 27-item self-completion questionnaire. It assesses physical activity undertaken across a comprehensive set of domains, including leisure-time physical activity, domestic and gardening activities, work-related physical activity, and transport-related physical activity. The short form asks about three specific types of activity undertaken in the four mentioned domains: walking, moderate-intensity activities, and vigorous-intensity activities. Domain-specific estimates cannot be estimated in the short form, but from a health perspective it is total physical activity that is important.

The continuous indicator of physical activity is presented as median MET-minutes/week (Metabolic Equivalent of Task). Volume of activity is computed by weighting each type of activity by its energy requirements defined in METs to yield a score in MET-minutes. METs are multiples of the resting metabolic rates and a MET-minute is computed by multiplying the MET score of an activity by the minutes performed. The following values are used for the analysis of IPAQ data: Walking = 3.3 METs, MPA = 4.0 METs and VPA = 8.0 METs. Using these values, four continuous scores are defined [18]:

Walking MET-minutes/week = 3.3 x walking minutes x walking days

Moderate MET-minutes/week = 4.0 x moderate-intensity activity minutes x moderate-intensity days

Vigorous MET-minutes/week = 8.0 x vigorous-intensity activity minutes x vigorous-intensity days

Total MET-minutes/week = (Walking + Moderate + Vigorous) MET-minutes/week scores

Assessment of alcohol consumption

The Time-line-follow-back scale (TLFB) [19] (Sobell & Sobell 1992) was used to describe alcohol-free days as well as number of drinks per day. By use of TLFB patients describe the daily number of standard drinks 30 days before the baseline interview. The average number of standard drinks consumed per week during the last 30 days is expressed as units/week.

Data processing and analysis

Data processing rules and analysis of the IPAQ were conducted according to “Guidelines for the data processing and analysis of the International Physical Activity Questionnaire”, as recommended by the IPAQ Research Committee [18]. Values lower than minimum

values for duration of activity (10 minutes) were recoded to zero and we excluded missing from the data.

We conducted chi-square test for the associations between diagnosis (abuse or dependency) and category of physical activity level according to World Health Organization (WHO) recommendations, and in order to assess the association between alcohol consumption and physical activity level. Furthermore, logistic regression analyses were conducted to allow controlling for covariates. Explanatory variables included in the logistic regression model were education, employment and living with a partner, which often have importance for both engaging in physical activity and in AUD treatment. Level of statistical significance was determined at $p < 0.05$. Analyses were conducted using Stata 14 statistical software (StataCorp LP, College Station, Texas).

Categorical Scores

The three levels of physical activity used to classify the study population are: Low, Moderate, and High. Individuals who did not meet the criteria for the categories Moderate or High are considered to have a low physical activity level. The pattern of activity to be classified as Moderate is five or more days of any combination of walking, moderate-intensity or vigorous-intensity activities achieving a minimum TPA of at least 600 MET-minutes/week. The criterion for classification as High is seven or more days of any combination of walking, moderate-intensity or vigorous-intensity activities achieving a minimum TPA of at least 3000 MET-minutes/week [18].

Findings

The WHO [20] recommends that adults aged 18–64 perform either 150 minutes of moderate-intensity physical activity (MPA) or 75 minutes of vigorous-intensity physical activity (VPA) during the week [20]. According to the IPAQ guidelines, these recommendations are equal to 600 MET-minutes per week [18]. We found that the majority of the sample did meet the criteria for being physically active as recommended by the WHO [20]. The analysis of data according to the IPAQ guidelines revealed that 20% of the sample had lower levels of physical activity than recommended by the WHO [20].

Frequency and amount of the physical activity among the patients can be seen in Table 2. Levels of physical activity in the study population according to the mentioned IPAQ- criteria were as follows: Low: 19 (20%), Moderate: 46 (48.4%), and High: 30 (31.6%). On average, participants had 18 (SD 10.5) drinking days before treatment initiation, where the amount of consumed alcohol was 48.8 (SD 45.7) units of alcohol per week (Table 1).

Days	Moderate PA days*) Mean (SD) = 2.7 (2.3) N (%)	Vigorous PA days**) Mean (SD) = 1.6 (1.9) N (%)	Walking days***) Mean (SD) = 3.8 (2.8) N (%)
0	27 (28.4)	40 (42.1)	20 (21.1)
1	4 (4.2)	15 (15.8)	5 (5.3)
2	20 (21.1)	12 (12.6)	16 (16.8)
3	13 (13.7)	11 (11.6)	4 (4.2)
4	5 (5.3)	8 (8.4)	2 (2.1)
5	15 (15.8)	6 (6.3)	13 (13.7)
6	3 (3.2)	2 (2.1)	2 (2.1)
7	8 (8.4)	1 (1.1)	33 (34.7)

*) Number of days with performed moderate-intensity physical activity

**) Number of days with performed vigorous-intensity physical activity

***) Number of days with performed walking

Table 2. Participants' engagement in physical activity at vigorous and moderate level and walking in the past seven days. Data processed according to IPAQ-rules (N=95).

The MET values of, respectively, TPA, VPA, MPA, and Walking set out in table 3 are all indicators of levels of physical activity among the participants in the study. Although mean values are presented here (Table 3), we focus on the median MET-minutes/week because of the non-normal distribution of energy expenditure in many populations, as proposed by the IPAQ protocol. Also, the median MET-minutes/week for performed total physical activity shows that the sample in general was physically active at a healthy level.

MET-min/week	Median	Mean	SD	Min	Max
Total PA	1836	2934.3	3015.9	0	13680
Vigorous PA	480	1228.5	1952.0	0	8640
Moderate PA	480	990.1	1280.9	0	5040
Walking	396	715.6	904.3	0	4158

*) missing on 24 patients due to data processing according to IPAQ guidelines, hence n=95

Table 3. Performed total, vigorous and moderate physical activity and walking in MET-minutes per week among patients in treatment for AUD, medians and means (N=95)*.

We found no statistically significant associations between alcohol use and physical activity. Hence, alcohol consumption did not predict physical activity in this sample. Nonsignificant findings are shown in Table 4. Having heavy alcohol consumption before treatment start did not predict a higher risk of having no or low level physical activity at treatment start (unadjusted OR = 1.34, (0.40; 4.52), adjusted OR = 1.39 (0.40; 4.77)), compared to not having a heavy alcohol consumption in the days before treatment start.

N=95	Adjusted OR [95% CI]	Unadjusted OR [95% CI]
Heavy alcohol use	1.39 [0.40 - 4.77]	1.34 [0.40 - 4.52]
Educated*)	1.48 [0.39 - 5.49]	1.16 [0.34 - 3.95]
Employed	0.63 [0.22 - 1.85]	0.69 [0.25 - 1.89]
Living with partner	0.87 [0.29 - 2.61]	0.89 [0.30 - 2.61]

*) Educated: 0: No education after municipal primary and lower secondary school, 1: High school and technical or college education

Table 4. The association between low level physical activity or physical inactivity (less than 600 MET-min/week) at treatment start and heavy alcohol consumption (more than 35 standard units) in the last 15 days of the month before treatment start (OR, 95% CI).

Discussion

Our analyses indicate that drinking behaviour prior to treatment start is not related to physical activity patterns measured at treatment start. Other studies have found positive associations between alcohol consumption and physical activity [1,6,21-23]. Yet, similarly to our findings, physical activity was not significantly associated with alcohol consumption in another study of health behaviours among adolescents [24]. Diverse associations between alcohol consumption and physical activity among a wide range of population groups are thus reported.

However, the focus of these studies was not on patients with alcohol use disorder (AUD). We found no studies specifically assessing the physical activity patterns of treatment-seeking individuals with AUD. Thus, our study is a contribution to the field of health behaviours of individuals in treatment for AUD, demonstrating that the majority of them fulfil the criteria for being physically active, but their alcohol use is not associated to their physical activity levels.

Nevertheless, it is interesting that heavy drinking was found to be positively associated with physical activity in most studies [2,3], but not in the present one. The small size and characteristics of our study sample - especially that the participants are mostly dependent and treatment seeking - may have had some impact in this difference.

Another interesting finding in the present study is that - although not a statistically significant association - alcohol consumption in the 15 days closest to treatment start predicted lower probability of total physical activity at treatment start. Although making a decision about solving the alcohol problem by seeking treatment could have led the individuals to other health promoting initiatives, we are not able to show concurrent behaviour change among patients with alcohol use disorder. However, pre-treatment changes in drinking behaviour were found among AUD patients in earlier studies [25,26], where patients started to limit their alcohol intake before treatment initiation. Alongside with this tendency, it is worth considering if one behaviour change leads to another behaviour change in a healthier direction in a study with a larger sample size. Behaviour change theorists discuss that changes in life situations often can lead to changes

in lifestyles [27]. In our case, the decision of seeking treatment for alcohol use disorder could possibly have led to decisions of a healthier lifestyle. However, our analyses were not able to show if there was a case of concurrent behaviour change among AUD patients. It is possible that physical activity behaviour is not easy to change just before or concurrently with treatment start, and therefore it is not surprising that we found no association between drinking behaviour and physical activity. Although nonsignificant, we found that alcohol consumption in the 15 days before treatment start may predict a lower probability of physical activity. This finding may support the findings by Lisha et al. [7] where alcohol dependent individuals were less physically active than individuals with alcohol abuse, because our study population mostly consisted of patients with alcohol dependence. Furthermore, this gives opportunity to discuss the relevance of intervening with physical activity or exercise for patients with AUD in order to reduce health risks. However, unlike former findings [7], we found no significant associations or differences in physical activity levels between patients with alcohol abuse and patients with alcohol dependence.

Study limitations

Although large, compared with many other studies, it is a limitation of our study that the sample was small. In addition, relatively many patients did not fill out the IPAQ questionnaire, and although hardly any differences were found between the patients who did or did not fill out the IPAQ, we cannot rule out that findings only cover a subgroup of patients seeking treatment for alcohol use disorders.

Validated psychometric methods as the TLFB and the IPAQ were used in the present study. The short IPAQ form "last 7 days recall" is recommended for national monitoring and the long form for research requiring more detailed assessment [28]. In this study, we have used the short form, and this may have some limitations. The IPAQ short form restricts itself to asking about physical activity in the week prior to the intervention. Although it has perfect validity the IPAQ has user-unfriendly aspects, as the difference between vigorous and moderate physical activity might be difficult to grasp and to estimate [29] (Committee 2008). Furthermore, it is suggested that even healthy populations are challenged in recalling the correct amount of performed physical activity [30-32], why we can assume that a sample with AUD could be even more challenged due to possibly cognitive impairment in form of declined working memory. Finally, the IPAQ is able to assess daily physical activity within all domains of life, but to assess physical activity as a health promoting behaviour another tool could be more suitable.

Conclusion

In general, our results indicate that the majority of the study population reaches the physical activity recommendations of the WHO [20]. However, one fifth of the study sample is not as physically active as recommended. Alcohol use prior to treatment start and physical activity at treatment start were not found to be associated to each other. Although overestimation due to self-report may have occurred, the sample size makes the study representative for patients in treatment for alcohol use disorder. Future studies with preferably larger sample sizes could benefit from using a more comprehensive tool for assessment of physical activity levels, such as the long form of IPAQ, which allows for asking into longer time periods and distinguishes between domains of physical activity.

References

1. Dias P, Oliveira A, Lopes C. Social and behavioural determinants of alcohol consumption. *Ann Hum Biol.* 2011, 38(3): 337-344.
2. Buscemi J, Martens MP, Murphy JG, Yurasek AM, Smith AE. Moderators of the relationship between physical activity and alcohol consumption in college students. *J Am Coll Health.* 2011, 59(6): 503-509.
3. French MT, Popovici I, Maclean JC. Do Alcohol Consumers Exercise More? Findings From a National Survey. *Am J Health Promo.* 2009, 24(1): 2-10.
4. Grønbaek M, Nielsen B. A randomized controlled trial of Minnesota day clinic treatment of alcoholics. *Addiction.* 2007, 102(3): 381-388.
5. WHO (2007) International classification of diseases and related health problems (10th ed.). Geneva: World Health Organization.
6. Smothers B, Bertolucci D. Alcohol consumption and health-promoting behavior in a U.S. household sample: leisure-time physical activity. *J Stud Alcohol.* 2001, 62(4): 467-476.
7. Lisha NE, Sussman S, Fapa F, Leventhal AM. Physical activity and alcohol use disorders. *Am J Drug Alcohol Abuse.* 2013, 39(2): 115-120.

8. Elder C, Deidre LD, Wang MQ, Nagy S, Green L. Organized Group Activity as a Protective Factor against Adolescent Substance Use. *Am J Health Behav.* 2000;24(2):108-113.
9. Brown RA, Abrantes AM, Minami H, Read JP, Marcus BH, Jakicic JM, Stuart GL et al. A preliminary, randomized trial of aerobic exercise for alcohol dependence. *J Subst Abuse Treat.* 2014, 47(1): 1-9.
10. Ejsing LK, Becker U, Tolstrup JS, Flensburg-Madsen T. Physical activity and risk of alcohol use disorders: results from a prospective cohort study. *Alcohol Alcoholism.* 2014, 50(2): 206-212.
11. Sinyor D, Brown T, Rostant L et al. The role of a physical fitness program in the treatment of alcoholism. *J Stud Alcohol.* 1982, 43:380–386.
12. Murphy TJ, Pagano RR, Marlatt GA. Lifestyle modification with heavy alcohol drinkers: effects of aerobic exercise and meditation. *Addict Behav.* 1986, 11: 175-186.
13. Brown RA, Abrantes AM, Minami H, Read JP, Marcus BH, Jakicic JM, Stuart GL et al. Aerobic Exercise for Alcohol Recovery: Rationale, Program Description, and Preliminary Findings. *Behav Modific.* 2009, 33(2): 220-249.
14. Rehm J, Mathers C, Popova S, Thavorncharoensap M, Teerawattananon Y, Patra J. Global burden of disease and injury and economic cost attributable to alcohol use and alcohol-use disorders. *The Lancet.* 2009, 373(9682): 2223-2233.
15. Laramée P, Leonard S, Buchanan-Hughes A, Warnakula S, Daepfen JB, Rehm J. Risk of All-Cause Mortality in Alcohol-Dependent Individuals: A Systematic Literature Review and Meta-Analysis. *EBioMedicine.* 2015, 2(10): 1394-1404.
16. Sari S, Bilberg R, Jensen K, Sogaard-Nielsen A, Nielsen B, Roessler KK. Physical exercise as a supplement to outpatient treatment of alcohol use disorders - a randomized controlled trial. *BMC Psychology.* 2013, 1(1): 23.
17. Sogaard Nielsen A, Nielsen B, Andersen K, Roessler KK, Buhlinger G, Bogenschütz M, Ekstrøm CT, Sogaard J. The RESCueH Programme: Testing New Non-Pharmacologic Interventions for Alcohol Use Disorders: Rationale and Methods. *Eur Addict Res.* 2016, 22(6): 306-317.
18. IPAQ (2010) IPAQ Scoring Protocol.
19. Sobell LC, Sobell MB. Timeline Follow-back: A technique for assessing self-reported alcohol consumption. In RZ, Litten I. (Ed.) *Measuring Alcohol Consumption: Psychosocial and Biological Methods* New Jersey: Humana Press, 1992, 41-72.
20. WHO (2010) Global recommendations on physical activity for health.
21. Leisure JL, Neighbors C, Henderson CE, Young CM. Exercise and Alcohol Consumption: What We Know, What We Need to Know, and Why it is Important. *Frontiers in Psychiatry.* 2015, 6(156).
22. Mukamal KJ, Ding EL, Djousse L. Alcohol consumption, physical activity, and chronic disease risk factors: a population-based cross-sectional survey. *BMC Public Health.* 2006, 6(118).
23. Naimi TS, Brown DW, Brewer RD, Giles WH, Mensah G, Serdula MK, Stroup DF et al. Cardiovascular risk factors and confounders among nondrinking and moderate-drinking U.S. adults. *Am J Prev Med.* 2005;28(4):369-373.
24. Vuori MT, Kannas LK, Villberg J, Ojala SAK, Tynjälä JA, Välimaa RS. Is physical activity associated with low-risk health behaviours among 15-year-old adolescents in Finland? *Scand J Public Health.* 2012, 40(1): 61-68.
25. Stasiewicz PR, Schlauch RC, Bradizza CM, Bole CW, Coffey SF. Pretreatment changes in drinking: Relationship to treatment outcomes. *Psychology of Addictive Behaviors.* 2013, 27(4): 1159-1166.
26. Epstein EE, Drapkin ML, Yusko DA, Cook SM, McCrady BS, Jensen NK. Is Alcohol Assessment Therapeutic? Pretreatment Change in Drinking among Alcohol-Dependent Women. *J Stud Alcohol.* 2005, 66(3): 369-378.

27. Minugh PA, Rice C, Young L. Gender, Health Beliefs, Health Behaviors, and Alcohol Consumption. *Am J Drug Alcohol Abuse*. 1998, 24(3): 483-497.
28. Hansen AW, Dahl-Petersen I, Helge JW, Brage S, Gronbaek M, Flensburg-Madsen T. Validation of an Internet-based long version of the International Physical Activity Questionnaire in Danish adults using combined accelerometry and heart rate monitoring. *J Phys Act Health*. 2014, 11(3): 654-664.
29. Committee PAGA. Physical Activity Guidelines Advisory Committee Report, 2008. Washington, DC: U.S. Department of Health and Human Services. 2008.
30. Rosa CS, Gracia-Marco L, Barker AR, Freitas IF Jr, Monteiro HL. Assessment of Physical Activity by Accelerometer and IPAQ-Short Version in Patients with Chronic Kidney Disease Undergoing Hemodialysis. *Blood Purif*. 2015, 40(3): 250-255.
31. Curry WB, Thompson JL. Comparability of accelerometer- and IPAQ-derived physical activity and sedentary time in South Asian women: A cross-sectional study. *Eur J Sport Sci*. 2015, 15(7): 655-662.
32. Dyrstad SM, Anderssen SA, Edvardsen E, Hansen BH. Cardiorespiratory fitness in groups with different physical activity levels. *Scand J Med Sci Sports*. 2014, 26(3): 291-298.

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