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Association of Physical Activity (Sport) and Quality of Life: A Literature Review

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Abstract: Physical activity, especially in a form of sport, is known to improve life quality. Somehow studies comparing the effect of physical activity on quality of life in patients with health problems and healthy people are limited. The aim of this study is to provide an insight and evidence of association between physical activity and life quality in a group of people with health problems and a group of healthy people.

Keywords: physical activity, sport, life quality, healthy people, people with health problems

Introduction

Physical activity is highly correlated with improved well-being. It gives positive effects not only for physical health but also mental health. Furthermore, physical activity can improve functional performance and can be used as an intervention for the prevention and treatment of various diseases such as hypertension (Pereira et al., 1999; Hanashiro and Ceria-Ulep, 2011; Juhász et al., 2015), heart diseases (Newschaffer et al., 1998; Powell et al., 1987; Franco et al., 2005), diabetes (Ekelund et al., 2007; Apor, 2009; Baidog and Herman, 2018; Tătar et al., 2018; Papp et al., 2019), and bone problems like osteoporosis (Gregg et al., 2003). Moreover, exercise which is one type of physical activity, can have the same effect to antidepressant treatment which given for people with moderate or mild depression (Knapen et al., 2014).

Health Organization (WHO) stated that around 3.2 million people died each year because of insufficient physical activity which results in the increase of the burden of global disease (Pratt et al., 2014; Ding et al., 2016; Gabnai et al., 2019). People with higher physical activity are known to have better life quality. Despite the fact that the benefit of physical activity to health is widely known somehow, the sedentary lifestyle still dominates the behavior and lifestyle especially in all generation (Müller et al., 2019; Biro et al., 2019; Laoues et al., 2019), especially young people population. The study by Kinmonth et al. (2008) showed intervention which facilitate the behavior change actually did not show more results compare to health promotion of physical activity given by using leaflet. There are other factors too that need to be considered like socioeconomic background and parents role in influencing lifestyle since people with higher socioeconomic background have more benefit in accessing sport service (Müller et al., 2019).

Besides the lack of motivation, the decline of physical activity also might be caused by certain health conditions. For example, people with respiratory health problems often feel reluctant to do physical exercise because of some factors like the decline of lung function and atrophy of leg muscles due to disuse, where they are struggled with exercise intolerance (Oga et al., 2003). Somehow it seems that improving physical activity in a long term could also be beneficial for people with respiratory problems like asthma and chronic obstructive pulmonary diseases (COPD) (Esteban et al., 2010; Müller et al., 2011; Müller et al., 2018).

Some studies investigated the correlation between these two variables, physical activity and quality of life, either in a population of elderly or young people (Rejeski and Mihalko, 2001; Bize et al., 2007; Dinyáné and Pusztai, 2016). Somehow studies comparing the effect of physical activity on quality of life in patients with health problems and its impact on the cost of illness are limited (Chomistek et al., 2013). So that re-examining the correlation between physical activity and life quality and the cost of illness in a group of people with health problems and a group of healthy people is essential. The main goal of this research is to provide an insight of association between physical activity (sport), and life quality. Also, the result of the study could be used as a reference for making guidelines related to physical activity (sport), to increase the quality of life and minimize the cost of illness. Furthermore, it can also be used as references for further studies.

Methodology

We searched for studies related to physical activity (sport), and life quality based on online journal databases including google scholar, Pubmed, and BMC with no restrictions on publication date so we can find comprehensive information. Search terms included the following: physical activity, sport, and life quality.

Table 1. Physical activity and quality of life in a group of people with health problems

Authors	Sample	Sample size	Design	Physical activity questionnaire	Life quality questionnaire	Results
Katayama et al., 2014	Chronic hemodialysis patients	31 men and 17 women	Cross sectional	Accelerometers	EuroQol questionnaire (EQ-5D)	In patients with non-hemodialysis treatment days, life quality is influenced by physical activity more than 4 METs
Aidar et al., (2011)	Stroke survivors	Belo Horizonte (N=48) Montes Claros (N=29)	Cross sectional	IPAQ short version	SF-36	Active people have better score of SF-36 compared to people with insufficient PA
Jepsen et al., 2013	Obese individuals Western Norway	49	Intervention	Accelerometer	SF-36	PA has positive correlation to physical functioning and life satisfaction. Somehow no association found between mental health and PA
Rand et al., 2010	Adults with chronic stroke	40	Cross sectional	Self-report questionnaire	SF-36	Association between PA and mental health was not found. Functional ability was related to the amount of daily PA performed. A number of daily PA contribute to the physical score of life quality independently.
Hebestreit et al., 2014	Cystic fibrosis (age ≥ 12 years, FEV1 $\geq 35\%$)	70	Intervention	Accelerometry & 7-day Physical Activity Recall Questionnaire	German version of CFQ-R questionnaire for adults and adolescent	Life quality was related with physical fitness, specifically on aerobic
Kallings et al., 2007	Patient in primary health care	481	Cohort	Self-reported exercise	SF-36 EuroQol EQ-5D	Prescription of physical activity can be used as a treatment to promote active lifestyle in primary health care.
Deenik et al., 2017	Inpatients	184	Cross sectional	Accelerometer (ActiGraph GTX+)	EuroQol-5D WHOQol-Bref	Correlations were found between physical activity and all domain of life quality except character of diseases, independent of patient, and environmental domain.
Blom et al., 2019	Attendee of primary care in Norway	835	Cross sectional	ActiGraph accelerometer	SF-36	Light PA was positively related with some domains of life quality (role emotional, physical functioning, vitality, role physical, and general health) while moderate and vigorous had the same positive associations but without role emotional. Sedentary time found to have negative correlation with life quality in all dimensions

Table 2. Physical Activity and Quality of Life in a Group of Healthy People

Authors	Sample	Sample size	Design	Physical activity questionnaire	Life quality questionnaire	Results
Acree et al., 2006	Healthy older adults	112	Cross sectional	Johnson Space Center physical activity scale	SF-36	Life quality was increased in all domains for the group who performed more physical activity, specifically bodily pain, vitality, physical functioning, role-physical, social functioning
Shibata et al., 2007	Japanese adults	1,211	Cross sectional	IPAQ short version	SF-8	People who performed PA based on the recommendation had better life quality on some dimensions.
Balboa-Castillo et al., 2011	People aged 62 and over	1,097	Cohort	PA questionnaire used in the Nurses' Health Study and the Health Professionals' Follow-up Study	SF-36	People who performed light PA in the upper quantile had better scores of SF-36 in the domain of mental health, bodily pain, vitality, linear trend, physical role, linear trendsocial functioning, emotional role and physical functioning
Omorou et al., 2013	French adult	4,909	Cross-sectional data	IPAQ short version	WHOQOL-BREF	Higher positive correlation was found between sport and life quality for people who performed high and low PA compare to people who did moderate PA. Dose-response association was found between social relationships and psychological health in women group
Anokye, et al, 2012	40–60 years old	5,537	Cross-sectional data	Accelerometer & Questionnaire related to sports and exercise, housework, walking, and occupational activity	EQ-5D	People who performed higher levels of PA had better quality of life. Even better life quality was shown in the objective measurement of PA compared to subjective measurement.
Motamed-Gorji et al., 2019	Students	23,043	Cross sectional	Physical Activity Questionnaire for Adolescents (PAQ-A)	Adolescent Core version of the Pediatric Quality of Life (PedsQL)	Significant correlation was found between total score of life quality and PA while sedentary time associated with lower score of life quality.
Nowak et al., 2019	University students	595	Cross sectional	IPAQ long version	Comprehensive Quality of Life Scale—Adult (ComQol-A5)	Household physical activity had more positive correlation to life quality. Negative relation was found between subjective and objective life quality and sedentary behavior at the weekend while sedentary during the week had positive relation with subjective life quality.
Chang et al., 2019	Taiwanese adults	6182	Cohort	2008 Physical Activity Guidelines for Americans (PAGA)	SF-36	Positive dose-response effects was found between life quality on the physical domain and regular exercise. More positive effects on life quality on mental domain was related with regular exercise. While irregular exercise improve life quality on mental and physical domain

We also used manual search from bibliographies of the articles we identified before. The inclusion criteria for this study are: the article was written in the English language, the study focused on physical activity (sport) in relation with quality of life. Cross-sectional studies, prospective cohort studies were considered for inclusion. Studies were excluded if they did not focus specifically on physical activity (sport) and quality of life. Protocol, secondary research, editorial articles, and studies with intervention were excluded as well.

The search identified 16 studies that fulfill the selection criteria which listed in the table 1 with detailed in the year and characteristics of the sample and methodology used in the studies. Most studies used cross-sectional design (n=11). Three studies used cohort design and two studies used interventions.

Instruments used to measure physical activity a accelerometer, Active Australia Survey, IPAQ, short form ipaq, physical activity scale of Johnson Space Center, 7-day Physical Activity Recall Questionnaire. Rand et al. (2010) used two kind of physical measurements accelerometer for objective measure and self-report questionnaire for subjective measure named PA Scale for Individuals with Physical Disabilities (PASIPD). Study by Balboa-Castillo et al. (2011) using spanish version of PA questionnaire that had been used and validated before in the Nurses' Health Study and the Health Professionals' Follow-up Study.

Discussion

From 16 studies on the review we identified seven instruments used to measure life quality. Those are EuroQol questionnaire (EQ-5D), SF-36, SF-8, World Health Organization Quality of Life Questionnaire abbreviated version (WHOQol-Bref), CFQ-R questionnaire, Adolescent Core version of the Pediatric Quality of Life (PedsQL), and Comprehensive Quality of Life Scale-Adult (ComQol-A5). SF 8 is abbreviated version of SF 36. Most of the studies used SF-36 scale. It has eight domain: physical functioning (PF), social functioning (SF), role physical (RP), role emotional (RE), bodily pain (BP), mental health (MH), general health (GH), vitality (VT).

Studies showed associations between physical activity (PA) level and quality of life (QOL). That higher PA resulted in a higher quality of life (Aidar et al., 2011; Shibata et al., 2007). Hebestreit et al. (2014) explained in more detail that life quality related to health was associated with aerobic exercise or sport (Omorou et al., 2013). While the study by Nowak et al. (2019) said it is the physical activity in the household, which was most positively correlated to the quality of life.

Physically active participants had higher life quality on physical functioning domain (Aidar et al., 2011; Acree et al., 2006; Jepsen et al., 2013; Rand et al., 2010), mental health (Chang et al., 2019), role-physical, vitality, social functioning, and bodily

pain (Acree et al., 2006). Different with studies by Jepsen et al (2013) and Rand et al (2010) that said no association between mental health and PA. While performing less frequent PA showed moderate reduction in psychological stress (Hamer et al., 2008). It seems physical exercise might have positive effect on mental health, however, the evidence base for it is limited (Biddle and Asare, 2011). Mindfulness however has positive impact on physical performance (Blair-Resnick, 2015), physical health (Murphy et al., 2012) and mental health (Prazak et al., 2012), hence its integration into curriculums is highly recommended (Lengyel, 2017; Lengyel et al., 2019a; Lengyel et al., 2019b). PA was not related with the environmental domain, independent of patient and disease characteristics (Deenik et al., 2017). In contrast with physically active time; sedentary time is known to be causing a negative impact. Sedentary time duration had a significant inverse association with total QoL (Motamed-Gorji et al., 2019). More specifically, time spent sedentary was negatively associated with physical functioning, general health, vitality, social functioning and mental health (Blom et al., 2019) while Nowak et al. (2019) explained that sedentary behaviour at the weekends was negatively related to objective and subjective quality of life but sedentary behaviour during the week related positively with the subjective quality of life.

Insufficiently active is defined as physically involved in moderate-intensity activity or activities for minimum ten continuous minutes per week but do not meet active classification which defined as equal or more than 150 minutes per week of moderate intensity activity (Carlson et al., 2015). Physical activity recommendation guideline used in study by Shibata et al (2007) was 23 METS per hour per week for adult. Somehow it could be varied based on individual conditions. This prescription of PA, can be a proper treatment in primary health care settings (Kallings et al., 2007). Even for people with health problems, physical activity still gave positive effect to life quality (Aidar et al., 2011; Blom et al., 2019; Deenik et al., 2017; Jepsen et al., 2013; Hebestreit et al., 2014; Kallings et al., 2007; Katayama et al., 2014; Rand et al., 2010).

Conclusions

Physical activity improves people's life quality in general. Some domains of quality of life that improved could be varied. Mental health as one domain of quality of life, in some studies related to physical activity but some studies did not show association between these two variables. Somehow doing physical activity as recommended which defined as moderate intensity of PA for 150 minutes per week or more, evident to improve life quality for all groups, including people with health problems. There are some limitations of this study. First the literature limited to english only. Bias in concluding the result could be affected by the difference of instruments used to measure variables. The strength of this study is that we searched in the online database without constriction of published years to have more comprehensive results.

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