RELATIONSHIP OF PHYSICAL FITNESS AND SPORTS PARTICIPATION WITH SELF-CONTROL IN VISUALLY IMPAIRED INDIVIDUALS

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Abstract:

Self-control is considered to link with a wide range of adaptive behavior. This study aims to illustrate whether physical activity, physical fitness, and sports experience have some associations with self-control in individuals with visual impairment, and is there any difference between self-control among visually impaired athletes versus non-athletes. A total of 220 participants including 110 players and 110 non-players participated in the study. Data were collected through a questionnaire consisted of demographic information, sports participation, and experience-related questions (7-items-IPAQ), and a brief self-control scale. The analysis revealed that the score of the self-control scale was significantly higher in participants with playing experience comparative to those no playing experience. Sports experience and physical activity were positively related to self-control scores, whereas body mass index (BMI) and resting heart rate (RHR) of all participants were negatively related to self-control scores. Findings suggest that the ability of self-control can be enhanced through participation in sports and physical activity among visually impaired individuals. Professionals and policymakers should consider strategies to promote physical activity and sports participation in individuals with visual impairment to enhance positive personality traits.

Keywords: *self-control, visually impaired individuals, physical activity, sports participation, socioeconomic status.*

Introduction:

Self-control is conceptualized as the ability to manage or change one's thoughts, responses, and emotional states that are believed to be central to a wide range of behaviors, and hence crucial to decrease social issues and enhancing one's well-being (Baumeister & Exline, 2000). A high level of self-control can cause a reduction in the use of alcohol, caffeine, smoking, and enhances financial management ability, commitment to goals, successful completion of household chores, refinement in study attitude, improvement in eating behaviors, and emotional regulation (Oaten

& Cheng, 2006a). However, a low level of self-control is suggested to relate to criminality, risky sex, substance dependency, and suicidality (Malouf et al., 2014). In sum, various variables including crimes, aggression, discipline, grit, success, addiction, academic performance, and happiness are linked to some extent with the ability of one's self-control.

These findings suggest that improving self-control is the fundamental development of positive behaviors and improvement of quality of life in individuals. Hence, interventions and strategies to improve self-control are among the top priority of the professionals and practitioners in the field of psychology. This is similarly important to consider the issues concerning self-control in special population as well. In particular, peoples with visual impairment face a wide range of psychological and social problems that are associated with the characteristic of self-control. The persons with visual impairment experience lower self-control ability in comparison with individuals with less visual impairment and psychological problems such as life satisfaction, anxiety, and depression appeared to be associated with their perceptions of self-control (Kleinschmidt et al., 1995). Therefore, improving the ability of self-control in visually impaired persons likely to be more important than that of sighted or less visually impaired individuals. Professionals dealing with issues concerning visually impaired persons, teachers, rehabilitation personals, and parents should aware of the means and interventions that could lead to boosting self-control among these populations.

Evidence indicated that participation in sporting activities might be one option to improve self-control. For example, in a research study, Shachaf and Katz (2014), compared personality traits including self-control, self-efficacy, and attribution style among athletes (competitive versus non-competitive sports) and non-athletes. Findings showed a significantly higher score in both athletic groups in comparison with the non-athletic group on all of the measures of the three personality traits. Toering and Jordet

(2015) investigated self-control in high versus low experienced soccer players. The analysis of this study yielded a significantly greater score on the measure of self-control in soccer players with greater experience and performance than that of soccer players with lower experience and lower performance. Findings from various other studies also demonstrated positive effects of sports participation on self-control (Ali, Azam, Mattiullah, & Akhtar, 2019; Chen, Li, Xie, Li, & Zhang, 2018; Chen et al., 2019; Park et al., 2016; Tedesqui & Young, 2017).

Although, it is established that sports participation positively influences self-control, however how sporting activities interact with self-control in a special population particularly in persons with visual impairment remains unaddressed to date. There is a need to fill this gap in the existing empirical literature. Individuals with visual impairment are fundamentally different in respect to their psychosocial problems, movement limitations, sports skill learning difficulties, and access to sporting activities than that of sighted persons (Nyman, Gosney, & Victor, 2010). In particular, visual impairment appeared to exert an inverse influence on psychosocial well-being (Nyman, Dibb, Victor, & Gosney, 2012). These individuals have fewer friends, more loneliness, lower level social skills, self-esteem, and academic success compared with sighted persons on these variables (Huurre & Aro, 1998). To this end, it is known that sports participation can enhance self-control in normally sighted persons, and individuals with visual impairment fundamentally different in respect to their physical and psychosocial profile in comparison with sighted individuals. Findings emerged from sighted individuals cannot be generalized on the persons characterized with visual impairment.

Hence, it is a question of further inquiry that whether sports participation interacts similarly with self-control as demonstrated by previous research in the case of sighted peoples or there is any other influence? Therefore, findings emerged from sighted persons

in respect to the effect of sports participation on self-control need to an extent on visually impaired persons. Therefore, the purpose of this investigation is to explore the effect of participation in sporting activities of blind cricket on self-control. It is expected that participants in the blind cricket group would show a significantly higher score on the measure of self-control than those of non-players' visually impaired counterparts.

Methods:

Research Design:

A descriptive design of the survey method was applied for current study to find the relationship of physical fitness and sports participation with self control in visually impaired individuals.

Participants

A total of 220 (age mean = 28.64; SD = 5.633; range = 16 - 40 years) male visually impaired individuals voluntarily participated in this study. Among them, 110 participants (age mean =28.05; SD=5.125; range= 16-42 years) selected from all Ten blind cricket teams of Punjab province of Pakistan (Eleven playing-side team with ratio 4, 3, and 4 players of B1, B2, and B3 (IBSA 2011) category, respectively) which are associated with PBCC (Pakistan Blind Cricket Council) and 110 visually impaired non-players (age mean = 29.23; SD = 6.065; range = 16 – 40 years), of the same region and impairment categories, were recruited as a sample. The sampling procedure was purposive that was utilized to select the respondants. Visual acuity based on the respondents' self-reports. The demographic characteristics of the athlete and non-athlete are shown in tables 1 and 2, respectively.

Table 1:
Demographic Characteristic of Athletes (N = 110)

Characteristics	Category	Frequency	Percentage (%)
Age(years)	16-20	4	3.6
	21-25	31	28.2
	26-30	43	39.1
	31-35	18	16.4
	36-40	14	12.7
Body Mass Index	Less Than 18 (Underweight)	3	2.7
	18-24.9 (Normal Weight)	93	84.5
	25-29.9 (Over Weight)	14	12.7
.	>30 (Obesity)	0	0
Education	Primary	3	2.7
	Middle	10	9.1
	Matriculation	31	28.2
	Intermediate	26	23.6
	Graduation	27	24.5
	Masters	12	10.9
	MPhil	1	.9
Experience	1-5 Years	45	40.9
	6-10 Years	40	36.4
	11-15 Years	22	20
	16-20 Years	3	2.7
Resting Heart Rate	68 bpm	27	24.5
	72 bpm	37	33.6
	76 bpm	39	35.5
	80 bpm	7	6.4
Occupation	Student	30	27.3
	Un-Employee	6	5.5
	Private-Employee	14	12.7
	Govt-Employee	60	54.5
Social Class	Poor	12	10.9
	Middle	98	89.1
Physical Activity Level	Low	0	0
	Moderate	0	0
	Vigorous	110	100

Table 2:

Demographic Characteristic of Non-Athletes (N = 110)

Characteristics	Category	Frequency	Percentage (%)
Age (years)	16-20	6	5.5
	21-25	26	23.6
	26-30	26	23.6
	31-35	32	29.1
	36-40	20	18.2
Body Mass Index	Less Than 18 (Underweight)	0	0
	18-24.9 (Normal Weight)	36	32.7
	25-29.9 (Over Weight)	71	64.5
.	>30 (Obesity)	3	2.7
Education	Primary	5	4.5
	Middle	16	14.5
	Matriculation	35	31.8
	Intermediate	23	20.9
	Graduation	19	17.3
	Masters	10	9.1
	MPhil	2	1.8
Experience	1-5 Years	0	0
	6-10 Years	0	0
	11-15 Years	0	0
	16-20 Years	0	0
Resting Heart Rate	68 bpm	18	16.4
	72 bpm	39	35.5
	76 bpm	41	37.3
	80 bpm	12	10.9
Occupation	Student	26	23.6
	Un-Employee	14	12.7
	Private-Employee	31	28.2
	Govt-Employee	39	35.5
Social Class	Poor	35	31.8
	Middle	75	68.2
Physical Activity Level	Low	0	0
	Moderate	0	0
	Vigorous	0	0

Measures

Data collected through demographic information, the Brief Self-Control Scale (BSCS-SF), and International Physical Activity tools (IPAQ-SF). For the satisfaction of blind and visually impaired respondents, regarding questionnaires, the scale of BSCS-SF and IPAQ-SF was printed into Braille language and in large font sizes.

Demographics

The information concerning age, playing experience, education level, and level of visual impairment, financial status, and occupation was collected through demographic data.

Physical fitness (body mass index and resting heart rate)

Increased body mass index (BMI) is believed to be inversely related to physical fitness in adolescents and adults (Nikolaidis & Ingebrigtsen, 2013). This suggests that a higher BMI score is related to lower physical fitness and vice versa. Height (meters) and weight (kilograms) of all participants (players and non-players) were measured to calculate BMI. The BMI score of 18 to 24.9 was considered in the healthy weight category and the participants who exhibited BMI scores below or above this range were categorized as underweight and overweight individuals, respectively.

In addition to BMI, resting heart rate (RHR) was also measured to assess the aerobic fitness of all participants. RHR is also suggested to be an important indicator of physical fitness. Research showed an inverse relationship between RHR and physical fitness such as decreased RHR associated with higher physical fitness and vice versa (Jensen, Suadicani, Hein, & Gyntelberg, 2013). Therefore, we measured the resting heart as a proxy to assess physical fitness in all participants.

Brief self-control

The Brief Self-Control Scale developed by Tangney et al., (2004) was administered to assess the self-control of the participants. This scale contains thirteen items to evaluate self-

control and is composed of questions including "I am good at resisting temptation" and "I wish I had more self-discipline". The participants were asked to rate themselves against each question on the five-point Likert scale. The Cronbach's alpha indicated the internal consistency of the BSCS in the current study as 0.70. This measure is considered a valid and reliable tool to assess self-control that has been using largely in previous research (Ali et al., 2019; Malouf et al., 2014; Tangney, Baumeister, & Boone, 2004). The thirteen items of this scale covers contents concerning controlling impulses and emotions and thoughts, as well as covers contents related to performance and habits regulation.

Physical activity

The physical activity of the selected sample was measured by using an international physical activity questionnaire short-version (Lee, Macfarlane, Lam, & Stewart, 2011) (IPAQ-SF). The seven items of this measure recorded the time spent on vigorous, moderate, and low-intensity physical activity, and sedentary time during the last seven days. This is believed to be a valid and reliable instrument to evaluate physical activity in adolescents and adults and has been extensively administered by previous research (Lee, Macfarlane, Lam, & Stewart, 2011). From the raw data metabolic equivalent task minutes per week (MET-min/wk) calculated and categorized as low, moderate, and highly active participants by the valid procedure used by previous research (Ainsworth et al., 2000; Craig et al., 2003). The obtained MET-min/wk scores from raw data and three categories (low, moderate, and high) were ultimately used for data analysis.

Procedure

All of the ten blind cricket teams representing Pakistan Blind Cricket Council Punjab province were invited to participate in this survey assessing the effect of participation in blind cricket on the self-control of blind cricketer players and non-cricketers. The team managers and coaches were communicated telephonically and consents were obtained verbally. Following team members and

coaches formally received a letter containing detailed information of the research project. All team members showed their willingness to participate voluntarily. The final schedule of face-to-face interviews with the blind cricket team members was made based on consulting and convenience of head coaches and team members. The representing researcher for data collection was well-trained and had the expertise and sufficient experience for working and communicating with visually impaired individuals particularly in a sport setting. The data was collected in three months from July to September 2019. Approximately 35 minutes was spent on the completion of the interview of one participant.

Data Analysis

The data from all 220 respondents including athlete and non-athlete (Cricketers) was successfully collected which was used for further analysis. Keeping in view the purpose of this study, descriptive statistics, t-test, and correlation analytical techniques were applied.

Results:

A graphic examination of the histogram, normal Q-Q plots, and box plots expressed that the self-control scores were approximately normally distributed for both athletes and non-athletes, with skewness of 0.326 (SE = 0.230) and kurtosis of -0.803 (SE = 0.457) for athletes and skewness of -0.356 (SE = 0.230) and kurtosis of -0.053(SE = 0.457) for non-athletes (Cramer and Howitt 2004).

The independent t-test yielded a significant difference between athletes versus non-athletes groups t (197.018) = 20.7, p = 0.01). The significantly high score observed of athletes showed (M = 45.85, SD = 2.11) on the measure of self-control than those of participants in the non-athletic group (M = 38.67, SD = 2.96). The analysis further indicated that the effect was larger = 0.83 (Cohen 2013). Table 3 depicts the results regarding group statistics.

Table 3:
Group Statistics

Athletes / Non-Athletes	N	Mean	Std. Deviation	Std. Error Mean
Athletes	110	45.8545	2.11086	.20126
Non-Athletes	110	38.6727	2.96186	.28240

The self control (M = 42.26, SD = 4.42) and body mass index (M = 2.4, SD =.54) displayed the significant negative correlation between them, r (220) = -.481, p < .001. Resting heart rate (M = 2.33, SD = .9) and self control (M = 42.26, SD = 4.42) have also showed the significant negative relationship between them, r (220) = -.145, p < .05, as reported in table 4. Pearson correlation's result indicated that there is significant positive correlation between self control (M = 42.26, SD = 4.42) and experience (M = 3.62, SD = 4.68), r (220) = .677, p < .001, as shown in table 4. Through table 4 it is concluded that both body mass index (M = 2.4, SD = .54) and resting heart rate (M = 2.33, SD = .9) indicate the significant negative correlation with total MET (min/week) (M = 4918.3, SD = 4264), r (220) = -.545, p < .01 and r (220) = -.136, p < .05, respectively.

Furthermore, correlation analyses assess the relationship between self-control, total PA (MET-min/week), and sedentary behavior (inactivity). Self-control was significant positive correlation with the total PA (MET-min/week) , r (220) = 0.781, p <. 001 and significant negative correlation with sedentary activity (inactivity), r (220) = -.591, p < .001, as reported in table 4.

Table 4:
Pearson Correlation Matrix Between Different Variables
(N = 220)

		1	2	3	4	5	6
1	Body Mass Index	-					
2	Resting Heart Rate	.204	-				
3	Experience	-.401	-.060	-			
4	Total PA (MET-min/week)	-.545	-.136	.746	-		
5	Sedentary Activity	.451	.172	-.566	-.718	-	
6	Total Self Control Score	-.481	-.145	.677	.781	-.591	-

Discussion:

This study sought to determine the relationship of physical activity, physical fitness, sports participation, and experience with self-control in visually impaired individuals with lower and middle financial status. The analysis yielded very important and novel findings regarding issues under investigation in this study. Our main findings indicated that the level of self-control was significantly greater in cricket players in comparison with scores on self-control measures in non-player participants. Furthermore, there was a significantly positive relationship of playing experience, physical activity, and physical fitness with self-control in visually impaired individuals with lower and middle financial status. The analysis illustrated very promising findings highlighting the significant role of participation in physical and sporting activities in developing self-control in the visually impaired population.

From the perspective of our main findings, it is clear that participation in a sporting activity such as blind cricket can potentially enhance self-control the peoples having a visual impairment. This finding seems in line with the empirical evidence provided by Chen et al. (2018); Chen et al. (2019); Shachaf and Katz (2014); Tedesqui and Young (2017); Toering and Jordet (2015) showed that participation in sporting activities exerts a

significantly positive influence on the personality attributes including self-control of the sighted and healthy players. Therefore, the findings that emerged from this study contributed to fill the gap by extending findings concerning the effectiveness of sports participation in special populations such as visually impaired persons. This influence of sports activities on self-control can be understood in the light of psychological and physical challenges encounters by athletes to achieve success and commitment and determination required to continue training for competitions in addition to additional psychophysical challenges about competitions. It has been proposed that sports participation likely to face situations exerting higher mental toughness (Nicholls, Polman, Levy, & Backhouse, 2009), greater biopsychosocial challenges and threats (Jones, Meijen, McCarthy, & Sheffield, 2009), and burden of strain exerted by physical training (Plowman & Smith, 2013). These challenges encounter by athletes might collectively result in promoting positive personality traits (Jones et al., 2009; Laborde, Guillén, & Mosley, 2016), facilitate adaptations to negative psychological states (Gerber et al., 2013), and perhaps learn better-coping strategies to address difficult situations underhand and better-controlling capacity (Polman, Clough, & Levy, 2010). Moreover, consistently experiencing challenging situations might provide opportunities to exercise the ability of self-control and repeated utilization might logically lead to increase self-control capacity. These might further contribute to developing higher-level self-control in visually impaired athletes than those of non-athletes visually impaired participants in this study.

The findings concerning the association of physical fitness with self-control showed that there were positive relationships between these two variables suggesting a higher level of physical fitness demonstrated by healthy BMI and lower resting heart rate have the potential to enhance self-control among visually impaired people. This finding is very important in that this is the first study addressing this issue in the research literature. As per our knowledge, to date, no study exists that presented a relationship

between these two variables in the visually impaired population. In the line with these findings, previous evidence demonstrated by Junger and van Kampen (2010); Kinnunen, Suihko, Hankonen, Absetz, and Jallinoja (2012); Will Crescioni et al. (2011)showing that healthy weight associated with higher self-control in visually normal and healthy participants. However, no study to date presented data concerning the relationship between resting heart rate and self-control neither in visually impaired population nor in sighted persons. Thus, findings that emerged from resting heart rate and self-control data that has made this study the pioneer to address this issue. The positive relation between healthy BMI and lower resting heart rate can be explained by an increased level of engagement in physical activity resulted in increased physical fitness that might further influence the self-control capabilities of the participants. Researchers argued that healthy BMI and reduced resting heart are the outcomes of increased physical activity, decreased sedentary behavior, and elevated physical fitness level (Ali et al., 2019; Drøyvold, Holmen, Midthjell, Lydersen, & and The Nord-Trøndelag Health, 2004; So & Choi, 2010).

In addition to the above findings, our analysis also demonstrated a significant positive relationship between physical activity and self-control in our sample. Previous literature suggested that physical activity positively associated with self-control characteristics among participants with normal vision (Ali et al., 2019). In line with our study, Junger and van Kampen (2010)documented that physical activity was positively related to self-control in the sample of healthy adolescents. Briki (2016) found that motivation to engage in physical activity significantly predicted self-control in American adults with normal vision. However, our study showed a similar effect for visually impaired persons. The beneficial effects of physical activity on self-control ability can be explained by the psychological benefits associated with elevated engagement in physical activity. The psychological benefits such as self-regulation (Oaten & Cheng, 2006b), augmented

emotions regulations(Bernstein & McNally, 2017), and improved cognitive functions and mood states (Best, Davis, & Liu-Ambrose, 2015) linked with increased physical activity.

Regarding the associations between playing experience and self-control, our results yielded a significantly positive relationship between both variables. Previously, the characteristic of self-control can be analogized with muscles that can be increased with consistent exercising (Muraven & Baumeister, 2000). In this line of conceptualization athletes with greater experience have undergone the greater practice of self-controlled ability that might be made this characteristic more stable and stronger in comparison with athletes with low experience level. Therefore it seems plausible to assume that athletes with a higher level of experience might show better self-control relative to their non-players counterparts.

Limitations

Although the data emerged some novel and important findings, however, this study also has some limitations, and hereafter these findings should be interpreted with caution. For example, no cause and effect relationship can be established due to using the cross-sectional nature of the research design for this study. There is a need for a longitudinal assessment on this topic. We used valid and reliable but self-reported measures of physical activity and self-control. Utilization of objective measures essentially needed in further investigations. Another limitation of this study was that we administered a short version of the self-control scale instead of using the original long version scale. Using the original version of the self-control scale is more apposite to increase the validity and reliability of the data obtained. Further studies are suggested to overcome these limitations.

Conclusion

In sum, this study showed a significantly positive relationship between physical activity, sports participation, playing experience, and inverse relation with BMI and resting heart rate

with scores on self-control measures in the samples of visually impaired individuals. This suggests that participation in sporting activities can enhance physical activity level and increase physical fitness among the visually impaired population that further leads to foster self-control. Based on this discussion, it can be concluded that sports participation can be considered as an interventional approach to boost self-control capabilities in visually impaired persons. Additionally, it can also be used to treat visually impaired persons facing problems due to low self-control. Professionals and policymakers should consider strategies to promote physical activity and sport to enhance positive personality traits in individuals with visual impairment.

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