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RESEARCH PAPER

Sport Participation and Happiness Among Older Adults: A Mediating Role of Social Capital

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Abstract

As the global population ages rapidly, from a positive aging view, promoting later life through sport participation has been recognized as strategies for maintaining and boosting the social and psychological health of older people. To better understand the role of sport participation among older adults, the primary purpose of the study was to explore the mediating role of social capital on the relationship between sport participation and happiness among older adults. A convenience sample of 208 pickleball participants aged from 50 to 83 years completed a survey. A level of pickleball participation was measured using Serious Leisure Inventory, social capital was measured by cognitive (i.e., feelings of trust and safety) and structural (i.e., community participation, neighborhood connections) social capital, and happiness was measured by a single item scale of general feelings of happiness. After controlling socio-demographic characteristics, results showed that (a) pickleball participation was significantly and positively predicted by general happiness, (b) pickleball participation was significantly and positively predicted by all three elements of social capital, (c) two elements of social capital (i.e., feelings of trust and safety, neighborhood connections) had a significant and positive mediating role on the relationship between pickleball participation and general happiness. We suggest that sport-based social capital intervention can add significant value to older adults' general happiness for successful aging.

Keywords Happiness · Social capital · Sport participation · Sport involvement · Older adults · Successful aging

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1 Introduction

According to the World Health Organization (2019), it is expected that the number of people aged 60 years and older will outnumber children under 5 years old indicating the pace of population aging is getting more rapid. When it comes to successful aging, from a positive aging view developed by Havighurst (1961) based on the activity theory, promoting a physically active lifestyle has been emphasized for maintaining and developing the social and psychological health of older people (Gilleard and Higgs 2002). Whereas aging is considered an unavoidable declining process causing fewer social interactions between the aging individual and others in the social system from the traditional medicalized view (Cumming and Henry 1961), a positive aging view recognizes that successful aging is possible through being active and continuing social interactions. From this perspective, many studies have been conducted on promoting later life as a period of enjoyment, growth, creativity, independence and development, rather than simply focusing on loneliness, disengagement, and decline (Gergen and Gergen 2001; Tornstam 2005). This line of positive aging literature has stimulated the health promotion movement by government, non-profit organizations, and business corporations all across the world reflecting a cultural emphasis on sport, physical activity, exercise, recreation, and leisure as strategies for maintaining and boosting the social and psychological health of older people (Gilleard and Higgs 2002; McPherson 1999).

In general, happiness refers to a subjective interpretation of one's life or the situation one is living in (e.g., Diener et al. 2003; Keyes 1998; Layard 2005) which is an individual's comprehensive assessment of both one's momentary emotions and a broad cognitive appraisal of their life. Due to a strong connection with an individual's health and quality of life, happiness has been a matter of great interest for researchers to study various populations including older adults. In the extant literature, the majority of the empirical studies on the link between aging and happiness found a U-shaped relationship among older adults even after controlling socioeconomic status (e.g., Blanchflower and Oswald 2008; Frijters and Beatton 2012; Godoy-Izquierdo et al. 2013; Graham and Ruiz Pozuelo 2017). In other words, happiness tends to decline from early adulthood to the middle adulthood and turns back up as we age. The underlying mechanism of this U-shaped relationship has been explained as higher aspirations of young adults than older adults and better skills of older adults to adapt to the unmet aspiration situation (Schwandt 2016). Nevertheless, Hellevik (2017) disputed that uncritically accepting the U-shaped relationship between age and happiness without controlling life condition variables is dangerous. Older adults are more likely to deal with significant life transitions such as loss of a spouse (Holland et al. 2013), physical challenges (Fässberg et al. 2016), isolation or loneliness (Smith 2012), and lose of purpose or life interest (Christensen et al. 1999), which could impact their happiness.

In the area of public health, social epidemiology is a branch of epidemiology that incorporates the social context into explanations of one's health status. From this perspective, scholars recognize one's social factors such as structural characteristics (e.g., social embeddedness, social network size, social institutions) or social behaviors or experiences (e.g., social support, social engagement, social attachment, social influence) significantly affect a broad range of psychological states/behaviors and mental health outcomes such as self-efficacy, self-esteem, depression/distress, emotional regulation, or happiness (Berkman and Kawachi 2014; Cwikel 2006). Among many, social capital has been investigated as a crucial predictor of general happiness in various populations (Leung et al. 2013).

The concept of social capital is much debated due to the nature of interdisciplinary discourse yet has been considered a critical construct (Onyx and Bullen 2000). While it has been poorly defined, most definitions of social capital highlight two features that it is a resource and it is produced through social connections (Kawachi and Berkman 2014). Thus, it can be defined as "the resources that are accessed by individuals as a result of their membership of a network or a group (Kawachi and Berkman 2014, p. 291). More specifically, two key elements—cognitive (what people feel; e.g., trust) and structural (what people do; e.g., social participation)—have been discussed and studied actively linked to psychological well-being (Harpham et al. 2002; Marlier et al. 2015; Phongsavan et al. 2006). For instance, in terms of cognitive social capital, the perceived trust and social support produced stress-buffering effects by increasing the level of feelings of security, self-esteem and confidence in one's coping mechanisms. Interacting with each other, both cognitive and structural social capital can promote perceptions of friendly, cohesive, and safe societies which may promote interactions among community members (Kawachi et al. 2004). A substantial body of research has suggested that social capital is a resource for mental well-being in older adults. General findings of research have indicated that social capital was a predictor happiness (Cooper et al. 2011; Litwin 2001; Theurer and Wister 2010), life satisfaction (Ajrouch et al. 2005; Pan 2018), and quality of life (Bowling and Dieppe 2005; Chen et al. 2009; Greaves and Farbus 2006; Henriques et al. 2020; Nilsson et al. 2006; Wiggins et al. 2004).

Compared to individual physical activity or exercise,[1] sport participation tends to be an effective tool for promoting positive social and psychological outcomes due to the social nature of participation (e.g., Berg et al. 2015). Yet, there are some major gaps among previous literature on effects of sport involvement among older adults. First, many previous studies have focused on the effects of physical activity (e.g., walking, gardening, occupational labor) or exercise (e.g., gym-based trainings) overlooking the effects of sport participations among older adults (Kim et al. 2019). Second, while several studies investigated the status and effects of sport participation for children/adolescents (e.g., Craig and Bauman 2014; Bean and Forneris 2017; Gardner et al. 2017; Lee et al. 2018) or adults (e.g., Bice et al. 2014; Green 2014), relatively fewer studies investigated its effects for older adults empirically. Third, the findings are still inconsistent and fragmented due to the lack of empirical studies (Webb et al. 2017) and more importantly, previous studies tended to neglect the relationships between the social and psychological outcomes treating them as two separate and unrelated outcomes of sport participation (e.g., Sato et al. 2016).To fill these gaps, the primary purpose of this study was to explore the effects of sport participation (i.e., pickleball) on an individual's happiness investigating the mediating role of social capital from a social epidemiological perspective among older adults.

It has been reported that many older adults have participated in different types of sports. In particular, pickleball has been one of the fastest-growing sports in the US and it is estimated 2.8 million players are involved nationally (Chen 2017). Although the game is played mostly as similar to tennis, the area of the court that players have to cover is smaller,

[1] In the present study, we define physical activity as "bodily movement produced by skeletal muscles that results in energy expenditure" (Caspersen et al. 1985, p. 126) and exercise as "physical activity that is planned, structured, repetitive, and purposive in the sense that improvement or maintenance of one or more components of physical fitness is an objective (Caspersen et al. 1985, p. 128). Sport is defined as "all forms of physical activity which, through casual or organized participation, aim at expressing or improving physical fitness and mental well-being, forming social relationships or obtaining results in competition at all levels" (European Sports Charter 2001).

and the ball is much lighter which makes it particularly accessible to older adults (Chen 2017). The Senior Olympics—a multi-sport event for older adults held annually in every state in the US—has also contributed significantly to the growth of pickleball. The growth of pickleball is attributed to an influx of baby boomers and to the activity's mild learning curve, which has opened doors for many older adults to participate in athletic competitions (Williamson 2016).

2 Hypotheses Development

While no studies have examined the relationship between sport participation and happiness, studies of physical activity and exercise have found a positive effect on happiness among older adults. In the study of Khazaee-Pool et al. (2015), it was found that a physical exercise program contributes to the level of happiness among older adults. While older adults who participated in the 8-week physical exercise program significantly reported improving happiness, the control group who did not involve in the program showed no changes in happiness. In addition, Menec (2003) demonstrated that engaging in sports or games is a significant predictor of happiness among older adults and Barreto (2014) found that physical activity is indirectly related to happiness which was mediated by older adults' social functioning and health status. According to Lera-López et al. (2017), leisure-time physical activity is also positively associated with happiness among older adults and perceived health mediates this association. Hence, the following hypothesis was established:

Hypothesis 1 One's pickleball participation will be positively associated with general happiness.

Along with the effects of sport participation on happiness, previous research has shown the positive relationship between sport participation and social capital among older adults. Toepoel (2013) found that sport activity significantly predicts social connectedness among older adults. According to a qualitative study of Komatsu et al. (2017), it has also shown that community-based regular physical activity is significantly related to social connectedness and mutual support among older adults. The participants reported that they feel a sense of safety within the community as well as start supporting each other feeling socially connected through the regular community-based physical activity program. Therefore, the following hypotheses were established:

Hypothesis 2 One's pickleball participation will be positively associated with social capital.

Hypothesis 2-a One's pickleball participation will be positively associated with community participation.

Hypothesis 2-b One's pickleball participation will be positively associated with feelings of trust and safety.

Hypothesis 2-c One's pickleball participation will be positively associated with neighborhood connections.

To date, the empirical evidences supporting the positive relationship between social capital and happiness is overwhelming (e.g., Bjørnskov 2008; Dolan et al. 2008; Hudson 2006; Leung et al. 2011; Matsushima and Matsunaga 2015; Tsuruta et al. 2019). In sum, the following hypotheses were established:

Hypothesis 3 One's social capital will be positively associated with general happiness.

Hypothesis 3-a One's community participation will be positively associated with general happiness.

Hypothesis 3-b One's feelings of trust and safety will be positively associated with general happiness.

Hypothesis 3-c One's neighborhood connections will be positively associated with general happiness.

Hypothesis 4 One's social capital will positively mediate the relationship between pickleball participation and general happiness.

Hypothesis 4-a One's community participation will positively mediate the relationship between pickleball participation and general happiness.

Hypothesis 4-b One's feelings of trust and safety will positively mediate the relationship between pickleball participation and general happiness.

Hypothesis 4-c One's neighborhood connections will positively mediate the relationship between pickleball participation and general happiness.

3 Methods

3.1 Participants

A convenience sample was recruited from an annual international pickleball tournament in a southern state in the United States. This tournament is known as one of the largest pickleball tournament in the world. The researchers set up a booth to administer the survey during the event. Respondents were approached to complete a paper and pencil survey. All participants were invited to voluntarily participate in the study. Participants were briefly introduced to the purpose and procedure of the study in which anonymity of the data were ensured. It took approximately 10 to 15 min to complete the questionnaire. The Institutional Review Board at Texas A&M University approved this process.

Of the 218 surveys retrieved, 10 cases were excluded because of incomplete responses. The final sample included 208 cases which consisted of 112 males (53.6%) and 96 females (46.4%). Considering that the gender proportion of the event population was 57% of male and 43% of female, the sample's gender proportion was similar to the population. Age of the samples ranged from 50 to 83 years ($M = 64.11$, $SD = 6.56$). The age breakdown of the samples was also somewhat similar to the age breakdown of the population in that nearly half of participants were aged between 60 and 69. According to the association, a total of

922 players (50 years and older) participated in the event. Among them, a total of 37% were aged between 50 and 59, a total of 46% were aged between 60 and 69, and a total of 17% were aged more than 70. In our sample, a total of 25% were aged between 50 and 59, a total of 52.9% were aged between 60 and 69, and a total of 22.1% were aged between 70 and over. A majority of participants identified themselves as Caucasians (93.2%). A total of 34.3% of the participants had a college education and 35.3% held a graduate degree. Most participants were married (81.6%) and 77.9% of participants indicated that they were retired. About 58.1% of participants identified as an intermediate player rating 3 or 3.5 for their skill ratings. The skill rating is a self-rated score ranging from 1.0 to 5.5 with half-point increments and a higher rating indicates a higher level of skills (United States America Pickleball Association 2019). More detailed demographic characteristics of the respondents are presented in Table 1.

3.2 Measures

3.2.1 Pickleball Participation

The level of pickleball participation was measured using six items adopted from Serious Leisure Inventory Measures which has been widely used and validated by previous studies (Gould et al. 2008, 2011). Respondents were asked to rate, on a scale from 1 (strongly disagree) to 5 (strongly agree), the degree to which they were involved in and committed to playing pickleball. Higher scores indicated more involvement in pickleball as a serious participant. The six items assessed the central characteristics of serious leisure (i.e., perseverance, career contingency, career progress, effort, unique ethos, identification). Sample items includes 'I overcome difficulties in pickleball by being persistent' (*perseverance*) and 'I try hard to become more competent in pickleball' (*effort*). As noted by Gould et al. (2011), the measure was used as an additive index to demonstrate variation in the levels of seriousness. The total score of six items were averaged ($M = 4.10$, $SD = 0.59$). Internal consistency reliability was established with Cronbach's alpha ($\alpha = 0.812$).

3.2.2 Social Capital

Perceived social capital was measured by nine items adapted from the original 36-item questionnaire developed by Onyx and Bullen (2000). Adopted items assessed both cognitive (i.e., feelings of trust and safety) and structural social capital (i.e., community participation, neighborhood connections). This 9-item questionnaire was validated and employed by the previous studies (e.g., Flores et al. 2013; O'Brien et al. 2004; Papastavrou et al. 2015; Phongsavan et al. 2006). The instrument was designed to measure three central constructs by three items each. The example questions include "Are you an active member of a local organization or club (e.g., sport, craft, social club)?" (*community participation*), "Do you feel safe walking down your street after dark" or "Do you agree that most people can be trusted?" (*feelings of trust and safety*) and "If you were caring for a child and needed to go out for a while, would you ask a neighbor for help?" (*neighborhood connections and reciprocity*). Each item was assessed with a 4-point Likert-type scale ranging from 1 (*no, not at all*) to 4 (*yes, very much*). The Cronbach's alpha values of the first-order constructs were 0.717 (*community participation*), 0.750 (*feelings of trust and safety*), and 0.703 (*neighborhood connections and reciprocity*) respectively indicating acceptable consistency (Hair et al. 2006).

Table 1 Demographic characteristics of the study participants ($n = 208$)

Characteristics	*n*	%
Age		
50–59	52	25.0
60–69	110	52.9
70 and over	46	22.1
Gender		
Female	96	46.4
Male	112	53.6
Education		
High school	21	10.2
College	108	52.2
Graduate school	73	35.3
Other	5	2.4
Occupation		
Employed	45	21.6
Retired	162	77.9
Temporarily unemployed	1	0.5
Ethnicity		
Caucasian	191	93.2
Hispanic	7	3.4
African American	2	1.0
Asian	4	2.0
Others	1	0.5
Marital status		
Married/partnered	169	81.6
Divorced	19	9.2
Single	14	6.8
Widowed	5	2.4
Pickleball skill rating		
Under 3	28	15.2
3	54	29.3
3.5	53	28.8
4	29	15.8
Over 4	20	10.8

3.2.3 Happiness

The single item scale developed and validated by Abdel-Khalek (2006) was used to measure general feelings of happiness. Responses to one question "Do you feel happy in general" were ranged from 1(minimum) to 10 (maximum). A higher score indicates a greater level of happiness. As previous studies have argued, since we assessed a unidimensional construct (i.e., how happy do you feel), this single item scale deemed appropriate (Cheung and Lucas 2014; Erreygers et al. 2019; Fisher and To 2012; Rodríguez-Muñoz et al. 2014).

3.3 Covariates

Age, gender, education, marital status and occupation were included in the analysis as control variables since those socio-demographic variables has been found to be associated with happiness and social capital. While there is a lack of consensus on how social capital varies across the life course, literature has shown the significant relationship between age and social capital either positively or negatively (McDonald and Mair 2010; Nilsson et al. 2006). Gender difference in social capital has also revealed that the associations vary based on different life experiences of men and women (Ajrouch et al. 2005; McDonald and Mair 2010). For education level, past research has shown that education is strongly and positively correlated with individual social capital (Alesina, and Ferrara 2000; Huang et al. 2009). Also, Nakhaie and Kazemipur (2013) showed a significant relationship between social capital and employment while Shapiro and Keyes (2008) found a significant association between marital status and social well-being. Even though the effects of socio-demographic variables on happiness vary, the significant relationships have been found (Fortin et al. 2015; Frey and Stutzer 2010; Helliwell and Putnam 2004). According to the study of Gerdtham and Johannesson (2001), for example, happiness is positively related to education level and negatively related to gender (i.e., men), marital (i.e., single) and occupational (i.e., unemployed) status.

3.4 Analyses

Using Statistical Package for the Social Science (SPSS, version 22), Pearson correlation coefficients were calculated to examine the directionality of relationships between the study variables. Regression analyses were used to estimate path coefficients. In each analysis, path *a* connects the predictor variable Pickleball Participation (*PP*) with three subconstructs of the mediating variable Social Capital (*SC*); path *b* links three subconstructs of the mediating variable SC (*SC-Community*, *SC-Trust and Safety*, *SC-Neighborhood*) to the outcome variable Happiness; and path *c'* links the predictor variable PP with the outcome variable Happiness considering the mediating variable SC whereas path *c* presents the total effect of the predictor variable PP on the outcome variable Happiness. The indirect effect was assessed as the product of the *a* and *b* path coefficients. In order to test the mediating effects, we implemented Hayes bootstrapping approach using the PROCESS macro Version 3.3 (Hayes 2017). This approach uses 5000 bootstrap samples for bias correction to set the 95% confidence intervals (CIs). A 95% CI that does not include zero shows indirect effects that are significantly different from zero ($p < 0.05$).

4 Results

Table 2 presents descriptive statistics and Pearson correlation coefficients of the study variables. Pickleball participation was significantly positively associated with three subdimensions of social capital ($r = 0.342$, $p < 0.001$; $r = 0.303$, $p < 0.001$; $r = 0.215$, $p < 0.01$) and general happiness ($r = 0.263$, $p < 0.001$). All three subdimensions of social capital were significantly positively associated with general happiness ($r = 0.242$, $p < 0.001$; $r = 0.279$, $p < 0.001$; $r = 0.181$, $p < 0.01$).

Table 2 Descriptive statistics and person correlation coefficients of study variables

Variable	1	2	3	4	5	M(SD)
1. PP	1	.342***	.303***	.215**	.263***	4.10 (.59)
2. SC-Com		1	.289***	.210**	.242***	3.12 (.70)
3. SC-Trust			1	.225**	.279***	3.41 (.50)
4. SC-Nei				1	.181**	3.22 (.78)
5. Happiness					1	8.64 (1.13)

PP playing pickleball, *SC-Com* social capital—community participation, *SC-Trust* social capital—feelings of trust and safety, *SC-Nei* social capital—neighborhood connections

*$p < .05$, **$p < .01$, ***$p < .001$

The results of regression analysis showed that general happiness was significantly predicted by pickleball participation (adjusted $R^2 = 0.113$, $F[7, 195] = 4.67$, $p < 0.001$) but not by community participation. In addition, general happiness was significantly predicted by feelings of trust and safety (adjusted $R^2 = 0.136$, $F[7,195] = 5.53$, $p < 0.001$) and neighborhood connections (adjusted $R^2 = 0.127$, $F[7,195] = 5.18$, $p < 0.001$). Therefore, hypotheses 1 and 2-a through 2-c were supported whereas only hypotheses 3-b and 3-c were supported.

The Fig. 1a through c shows the results of mediation analyses of social capital on pickleball participation and happiness. As shown in Fig. 1a, because general happiness was not significantly predicted by community participation, the mediation effect was not significant. Hence, hypothesis 4-a was not supported. But the indirect effects of pickleball participation to general happiness through feelings of trust and safety ($\beta = 0.099$, SE = 0.0.46, 95% BCa CI [0.022, 0.203]) and neighborhood connections ($\beta = 0.060$, SE = 0.0.44, 95% BCa CI [0.002, 0.170]) were significantly positive indicating hypotheses 4-b and 4-c were supported.

5 Discussion

The primary aim of this study was to explore the mediating role of social capital on the relationship between sport participation and happiness among older adults. We investigated the indirect effects of pickleball participation on general happiness through three subdimensions of social capital including community participation, feelings of trust and safety, and neighborhood connections after controlling socio-demographic characteristics (i.e., age, gender, education, occupation, marital status).

The findings suggested that pickleball participation was significantly and positively predicted by general happiness among older adults. This finding supports previous studies of sport participation and positive psychological outcomes. For instance, sport participation could predict older adults' positive subjective well-being (Heo et al. 2018), positive mood state, and fewer depressive symptoms (Bardhoshi et al. 2016; Muller et al. 2011; Ostlund-Lagerstrom et al. 2015). Given that one of the most commonly identified outcomes were fewer depressive symptoms among children/adolescents and reduced stress and distress among adults who participated in sport programs (Eime et al. 2013a, b), some inconsistent results have been found among older sport participants. For instance, Hoar et al. (2012) found that roughly 70 per cent of the sample composed of older master athletes who

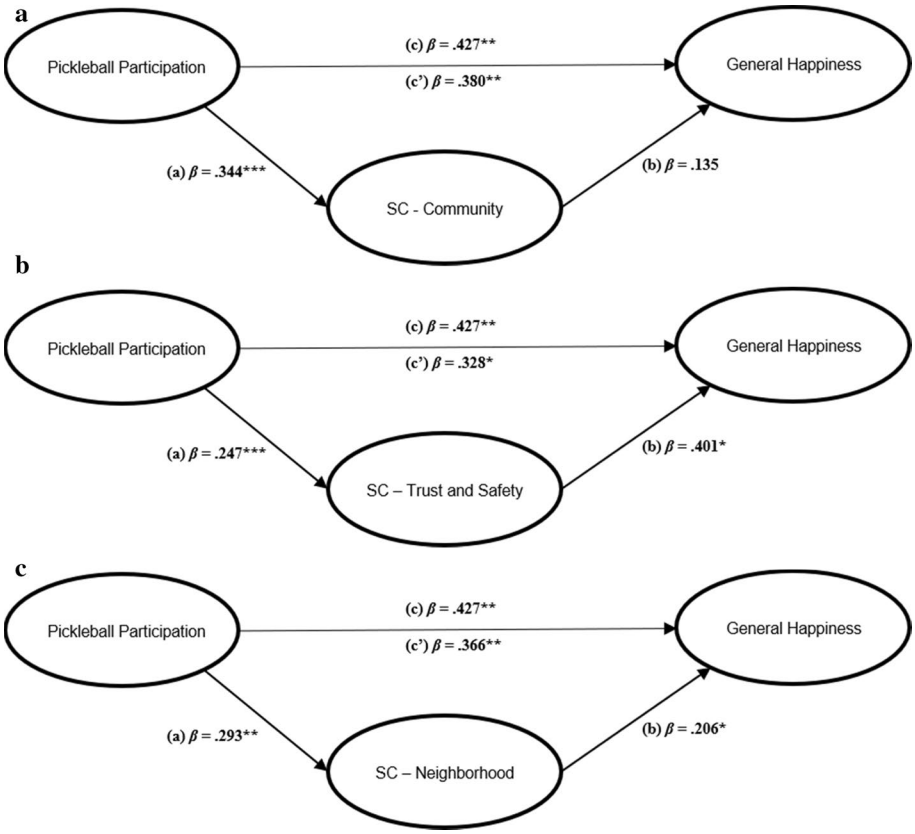

Fig. 1 **a** Mediation analysis of social capital (community participation) on pickleball participation and general happiness. This model presents nonsignificant indirect effects. **b** Mediation analysis of social capital (feelings of trust and safety) on pickleball participation and general happiness. This model presents significantly positive indirect effects: $\beta = .099$, SE = .0.46, 95% BCa CI [.022, .203]. $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$. **c** Mediation analysis of social capital (neighborhood connections) on pickleball participation and general happiness. This model presents significantly positive indirect effects: $\beta = .060$, SE = .0.44, 95% BCa CI [.002, .170]. $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

participate in a Senior Games reported pre-competitive stress derived from performance, logistics, novelty, preparation, and health. Even though the positive relationship between pickleball participation and happiness was found in our study, it would be noteworthy to investigate the level of stress depending on the various factors (e.g., personality, competition level) among older sport participants in the future.

The present study is distinctive from the previous studies in that we investigated the mediating role of social capital on the relationship between sport participation and one's general happiness. While many previous studies investigated the effects of sport participation on either social outcomes or psychological outcomes treating these two separate outcomes, we tested the potential link between social capital and happiness from a social epidemiological perspective. Our findings suggest that two subdimensions of social capital (i.e., feelings of trust and safety, neighborhood connections) has a significant and positive mediating role on the relationship between pickleball participation and general happiness among older adults. One subdimension of social capital – community participation was

not a significant predictor of happiness nor a significant mediator. This finding is somewhat consistent with the findings of Phongsavan et al. (2006). In their study, only two elements of social capital (i.e., feelings of trust and safety, neighborhood connections) were significantly associated with levels of psychological distress after controlling for relevant socio-demographic factor, health-related behavior and health status whereas community participation was not a significant predictor. The present study did not assess the nature or quantity of community participation. It is possible that this relationship was not observed due to the way of assessment. Opportunities to participate in community activities may be infrequent in some settings depending on the different geographical areas or different time of the year. Differently designed assessments of this subconstruct may be able to observe the relationship in future studies.

In our study, sport participants were recruited at the sport event. The finding was consistent with previous studies showing that sport event participation as a participant can be beneficial for one's psychological well-being (e.g., Sato et al. 2016). Nonetheless, there are many sport participants who are involved in local sport leagues or community-based sport programs but are not necessarily involved in sport events. Considering the distinctive nature of these programs such as regular and continuous involvement opportunities, these sport participants may obtain different types of social benefits such as a sense of community that can affect one's psychological well-being in a different way. A sense of community is defined as an environmental or community characteristic that results in individuals feeling a sense of belonging at the group-level (Sarason 1974). A sense of community is significant in that it can promote desirable health outcomes among older adults such as life satisfaction (Zhang et al. 2017), lower incidences of depression, (Tang et al. 2015), and higher levels of well-being (Zhang et al. 2018). There have been a few conceptual studies and a scale development study that describe how a sense of community can be shaped through sport participation and how it can be measured (Warner et al. 2013). However, there have been no empirical studies that investigate the relationship between a sense of community shaped through sport program participation and the various resulting psychological health-related outcomes. Distinguishing between the outcomes of sport event participation and sport program participation at the local level would clarify the different underlying mechanisms of "sport for health" among older adults.

This study provides empirical support that dimensions of social capital have strong connections with psychological status and well-being, therefore increasing the power of the construct for intervention purposes. In spite of many research on social capital and health, there have been only a few intervention studies (Villalonga-Olives et al. 2018). Social capital and health interventions that are designed to improve health through social capital enhancement are promising yet an unexplored answer to address the influence of social capital on health. When it comes to social capital interventions, there are two different levels of target: the individual level social capital (e.g., increased informal interactions) and the community level social capital (e.g., neighborhood spaces to enhance a community identity) A systematic review of social capital interventions and health showed that various types of interventions (yet only few) including environmental change at the school work, and/or municipal level, interventions promoting management and leadership development, network interventions, interventions based on dialogue and reflective thinking (see Villalonga-Olives et al. 2018). There was only one study that ran a 10-week physical exercise program for promoting multilevel social capital. At the community level, workers participated in a 10-week group-based physical exercise program, and at the individual level, an individual did physical exercise at home during leisure time (Andersen et al. 2015). Our findings suggest that sport programs can be an effective tool as a multilevel social capital

intervention for health among older adults and recognize the considerable need of future sport-based social capital intervention research. At the community level, participating in regular local-based sport programs or leagues can strengthen neighborhood network and support. Furthermore, well-designed programs with purposeful strategies such as mentor-based sport programs may boost individual social capital resulting in positive health behaviors and outcomes. For instance, using college students or peers to mentor older adults sport programs may enhance individual health through increased physical activity or self-esteem (Lee and Choi 2016).

In the similar context, even though this study found a positive relationship between the level of sport involvement and general happiness after controlling some socio-demographic factors such as age, gender, education, marital status and occupation, this study was cross-sectional and non-experimental studies indicating lack of internal validity. Even though there have been many physical activity or exercise-based intervention studies among older adults or sport-based intervention studies for children/adolescents (Pan et al. 2016; Werch et al. 2003; Williams et al. 2015), there is no sport-based intervention studies for older adults so far. More rigorous research designs such as longitudinal and experimental design need to be employed in the future in order to confirm the positive effect of sport involvement.

The positive effect of sport participation on social capital appears self-evident because sport can be an effective platform for people to socialize and broaden their social networks and relationships. Nevertheless, several scholars have cautioned that the relationship between sport participation and social capital can be more complex highlighting the dark side of it such as social segregation (Crow 2004). The networks formed via sport involvement could serve as constraints excluding non-members because social solidarity of groups has been linked to the exclusivity of group (Crow 2004). For instance, DeLuca (2013) investigated how upper middle-class families obtain, transmit, and preserve their social capitals through swim and tennis club membership using ethnographic approach. The author argued that the sport club was a significant but hidden platform that these upper middle-class members can facilitate their social class and race-based privilege. Through enhanced level of a sense of community and belonging among members as well as increased special social learning opportunities provided by the sport club, the members could produce of their privileged habitus. This dark side of sport involvement for social capital needs to be considered for sport-based interventions among older adults in order to diminish negative health effects of social capital (Villalonga-Olives and Kawachi 2017).

In this study, we used the instrument for serious leisure to measure the level of sport participation among older adults. Even though various instruments have been developed and validated to assess the sport participation of children and adolescents such as Sports Participation and Attitudes Questionnaire for Children and Adolescents (Donaldson and Ronan 2006), there has been no attempt to develop new instruments to assess the level of sport participation and related behavioral patterns for older adults or to modify the previous ones of younger generations to older generations. For instance, Kim and colleagues (2019) recognized the unique values of sport participation among older adults such as resistance to the negative view of aging and value of being competitive in sport activities. Nevertheless, there is no instrument that address these characteristics that can be derived from the distinctive aging-related variables for sport participation. Therefore, further development and use of instruments for older adults' sport involvement is required.

In the similar context, several studies including the present study conceptualized and operationalized the construct of serious leisure to study the older adults' serious sport involvement (e.g., Heo et al. 2018). The majority of study participants in our study was

serious sport participants ($M = 4.07$, $SD = 3.85$). Serious leisure is characterized differently from casual leisure based on six attributes: (a) need to preserve at the activity, (b) development of a leisure career, (c) need to put in effort to gain skill and knowledge, (d) gaining social and personal benefits, (e) unique ethos and social world, and (f) an attractive personal and social identity (Stebbins, 2007). Despite the fact that this construct and relevant instrument may be advantageous to for investigating the devoted sport participants, it is challenging to explore the characteristics at the other end (i.e., casual leisure participants, newcomers). As Baker et al. (2010) argued, more studies need to investigate the antecedents and consequences of individuals who are motivated to participate in sports in their later years. For example, few studies found that competitive sport participation for late starters tended to build a new or alternative personal identity as a winner and a highly physically active person. Further studies are necessary to develop conceptual and theoretical frameworks and relevant instruments to explore what affects the advent of this new identity and how it influences the late starters' lives more in depth among newcomers and casual older sport participants.

5.1 Study Limitations

First, because this study was cross-sectional and correlational, we cannot establish a causal effect, or we cannot rule out the possibility of reverse causality between social capital and happiness or sport participation and social capital. For instance, perceiving community to be untrustworthy or the absences of social interactions with neighborhood can be a consequence of happiness (Ljunge 2018). In the similar sense, individuals who perceive community to be trustworthy and who tends to actively interact with neighborhood may be more likely to play sports with other people. Therefore, as we discussed above, more intervention-based studies and longitudinal studies should be conducted in the future to confirm the causal relationships among sport participation, social capital, and happiness.

In addition, the findings were drawn from a convenience sample which was predominantly composed of Caucasians whose educational levels were relatively high. Even though we could compare the gender and age proportions of our samples and the whole event participants, any other demographic characteristics of all participants (e.g., ethnicity, educational level) were not available. Nearly half of the event population and our samples were players aged between 60 and 69 which is categorized as relatively the "young-old" population. Even though the age was included as a covariate in this study, it would be beneficial to investigate if there is any different relationships between sport participation, social capital, and happiness among the "middle-old" population (70 to 79 years), and the "old-old" (80 years and older) population in the future. Additionally, it has been noted that levels of social capital vary depending on geographical variations (Mohan et al. 2005). While this study controlled significant socio-demographic variables, each participant's geographical location was not controlled because the research participants were recruited at the international-level sport event. Future studies can benefit from demographically and geographically diverse samples.

The present study recruited pickleball players to investigate the role of sport participation on happiness among older adults. Yet, as Asztalos et al. (2012) suggested, different types of sport participation may have different effects on mental health. For instance, Asztalos et al. (2012) explored 19 different types of sports to examine the gender differences in mental health status. Among these sports, some sport types may be also applicable to older adults such as golf, ball games (e.g., softball, basketball, volleyball) or racket sports (e.g.,

tennis, squash, table tennis). Future studies may explore the effects of sport participation on psychological well-being among older adults according to the different types of sport categories.

6 Conclusions

This study provides important insights into the role of sport participation in older adults' happiness and the role of social capital in this relationship. Regression analyses disclosed that sport participation and both cognitive social capital (i.e., feelings of trust and safety) and structural social capital (neighborhood connections) significantly predict one's general happiness. Playing pickleball as a sport involvement would add significant value to older adults' daily psychological well-being status which can contribute to successful aging. In the future, sport-based social capital intervention studies would be helpful to confirm the causal effect of sport involvement on one's happiness and other psychological well-being indicators among older adults.

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