



## Effect of playing golf on children's mental health

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### ABSTRACT

Adolescents in particular are exposed to high stress levels due to biological changes, identity development and higher academics demands at school (Schraml, Perski, Grossi, & Simonsson-Sarnecki, 2011). The construct of resilience can be understood as a factor for healthy development: those who manifest high resilience experience more positive emotions (Tugade & Fredrickson, 2004; Wolin & Wolin, 1993) and can improve both their self-esteem and psychological adaption reaction (Block & Kremen, 1996). According to previous investigations, golf has a favourable impact on the development of resilience due to its lack of direct opponents and comparatively low time pressure (Drane & Block, 2006), and was therefore used as an intervention in the present study. During a period of three months, the control group (CG;  $n = 25$ ) played soccer and the intervention group (IG;  $n = 25$ ) were trained in golf. Data measuring resilience (a shortened version of the resilience scale; Schumacher, Leppert, Gunzelmann, Strauß, & Brähler, 2004) was collected twice, once at the beginning and again towards the end of the intervention. An intergroup comparison revealed significant differences in the development of resilience between CG and IG ( $p < 0.001$ ; *Cohen's d* = 2.041), with the IG showing greater improvement. It can be expected that golf training demonstrates a positive influence on children's resilience development. Follow-up studies should examine the long-term effects of these results to provide a justification for including golf in school sports.

### 1. Introduction

It is still rare for children and adolescents to cope with challenging life events through the preventive effects of physical exercise and spending time in nature (Bös, 2009). In Germany, less than one-third of the latter group reach the recommended 90 minutes of moderately intense activity daily (Bucksch & Finne, 2013; World Health Organization, 2010). Regarding participation in sports, there is a clear trend: compared to adolescents, younger children exercise more frequently, intensely and for longer durations (EU Working Group "Sport and Health", 2008). In their free time, both groups spend approximately three days a week doing outdoor activities. In their meta-analysis, Keniger, Gaston, Irvine, and Fuller (2013) describe the benefits of nature for psychological well-being, cognitive performance, physical health and social interactions. Girls and boys pursue everyday activities that take place predominantly indoors. So, they, benefit only slightly from the positive effects of nature. They are especially exposed to increased stress levels due to biological changes, the development of identities, greater academic demands, lifestyle changes from childhood to adulthood and social conflicts (Schraml, Perski, Grossi & Simonsson-Sarnecki, 2011). Children and adolescents are the healthiest age group of all. Nevertheless, they are also in a sensitive stage that is decisive in

personality development and realisation of future opportunities (Thompson, 2017). Due to the health-promoting properties of nature and sport, young people should be encouraged to pursue a long-term interest in outdoor sports maintain a high quality of life into late adulthood.

The preservation and promotion of mental health is also an important component of successful development in one's youth and a high quality of life at a later age. One of the most important resources to this end is the construct of resilience; this can be interpreted as psychological resistance (Block, 2002). Some scientists interpret resilience as a relative personality factor and believe in the existence of so-called 'resilience-constellations'. In this concept, specific person-situation constellations may clarify whether certain conditions have adverse or stimulating effects. Resilience is therefore not innate, but can be developed and increased across lifespan. Other researchers define it as a stable personality trait (Block, 2002; Block & Adam, 1996). A high level of resilience is important to promoting overall health (Block & Kremen, 1996; Tugade & Fredrickson, 2004; Wolin & Wolin, 1993). This can be achieved by various measures, one of which may be an intervention through sports.

Through incorporating outdoor exercise, and its low risk of injury and proven positive effects on mental health, golf is a sport that learners

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can continue to practise throughout their lives. The German project 'Abschlag Schule' enables its integration into school sports and intends primarily to allow pupils to choose a suitable profile for their interests and abilities. Its guiding principle includes the holistic education of children and adolescents in and through sports. Golf seems to be an appropriate sport for both trained and untrained individuals with the goal of encouraging lifelong participation in sports in young people (Drane & Block, 2006; Lane & Jarett, 2005).

The positive effects of golf have already been established in studies with middle-aged or older adults (Carless & Douglas, 2004; Farahmand, Broman, Faire, Vågerö, & Ahlbom, 2009; Lane & Jarett, 2005; Muff, 2008; Parkkari et al., 2000; Siegenthaler & O'Dell, 2011).

Parkkari et al. (2000) showed that playing golf significantly increased aerobic performance and trunk muscle endurance in male golfers aged between 48 and 64 years. All subjects had been sedentary before the study and played golf two to three times a week during the intervention period, while the controls remain inactive.

Swedish researchers proved, that the most skilled players (middle-aged golfers with the lowest handicap) had the lowest mortality (Farahmand et al., 2009). They searched out that regularly golfing may reduce weight, waist circumference and abdominal skin total thickness. The improvement in body and vital values has a positive impact on mortality. Furthermore, older golfers have a healthy lifestyle: only a few of them smoke and most golfers eat balanced and healthy.

Golf teaches mental flexibility through constant changes in both external situation and state of mind; golfers have to deal with a variety of conditions (Muff, 2008). During a full round of the game, approximately 85% of the time is not engaged in active play. Effective emotion management is therefore of great importance during breaks. Between swings, the golfer should stay focused and not to be distracted by intruding thoughts. Focusing on the present situation and performance requirements seems to be crucial for successfully meeting the high demands of the sport. Playing golf improves one's ability to handle personal expectations: of every 70 swings, only five to six proceed as expected. This corresponds to an average rate of 10% (Muff, 2008). Nevertheless, it should be considered that that rate might depend on several factors (for example motivation and attention of the player or weather conditions). Athletes are used to dealing with the knowledge that they will almost never perform as well as they anticipate. Golf thus promotes the domination of anger, overcoming of fear, mental engagement with active tasks and handling of failures (Drane & Block, 2006). It conveys a sense of freedom and autonomy, as well as improves self-esteem, resilience, self-efficacy, empathy and quality of life (Drane & Block, 2006).

The research group led by Weiss first performed a scientific examination of the positive impact of golf on children (Weiss, Bolter, & Kipp, 2016; Weiss, Stuntz, Bhalla, Bolter, & Price, 2013). In an initial study, they analysed the differences between children aged between ten and 17 who regularly played golf (as part of the 'First Tee' initiative) and a comparative group who engaged in other sports (Weiss et al., 2013). The former participated in the initiative for two years whereas the latter group had been involved in various sports teams for three years. A qualitative self-assertive measurement indicated significantly better values for children who golf in the following parameters: emotional management, perceived academic self-confidence, dedication, responsibility, honesty, preference for challenging tasks, ability to seek help (by finding suitable role models or trustworthy persons), sociability (expansion of social network), acceptance of ethnic diversity and self-managed learning. In a second wave of research, Weiss et al. (2016) examined the long-term effects of golfing after three years. The results demonstrated significant improvements in the following facets: ability to seek help, sociability and acceptance of diversity.

As these studies are based on qualitative self-reports, they should therefore be supported by quantitative data. Furthermore, there were no baseline measurements taken at the beginning of the activities. For this reason, the measurable improvements found after one year of

golfing might be attributable to existing differences before the intervention began. The results of Weiss and colleagues can be assessed as preliminary evidence for the positive effect of golf on children's health.

However, there is a lack of empirical evidence for a favourable influence on children's health. The present study attempts to reduce this research gap and contribute to promoting the well-being of young people. The aim of the study is to examine the effect of guided golf training on the resilience of children and adolescence. The influences of time pressure and opponents are minor in golf compared to other sports, and thus learners are able to focus more on their problem-solving skills and attribute success to their own competence. The characteristics enumerated above make the sport ideal for improving children's resilience.

## 2. Method

### 2.1. Study design

The present study was part of a larger project on children's mental health development at the Karlsruhe Institute of Technology (KIT; Karlsruhe, Germany). Participants were recruited from the ongoing 'Abschlag Schule' project in the Karlsruhe area (Baden-Württemberg, Germany). In the present study only resilience was assessed as outcome measure.

### 2.2. Subjects

The study included 23 boys and 27 girls ( $n = 50$ ) aged between 10 and 12 years in statistical analysis. The average age of the children was  $M = 10.32 (\pm 0.07)$  years. The flow of participants from beginning to end were illustrated in Fig. 1.

At the time of the survey, all the subjects were attending the fifth grade of a secondary school in Baden-Württemberg (Germany) and were recruited through the project 'Abschlag Schule'. Notably, the school has been involved in this collaborative project for more than three years. The class teachers informed the students about participating in the current study. All students attend on a voluntary basis and could terminate their participating at any time. Each participant was randomly assigned by flipping a coin to one of two research group:

- (1) Control Group (CG): played soccer for three months
- (2) Intervention Group (IG): played golf for three months

Over the course of a semester, each group practices their respective sport once a week for about 90 minutes. The coach was indeed informed about the title of sport lessons ('Abschlag Schule'), but not about the purpose of the current study.

The study was divided into three phases: pre-test, intervention and post-test. A brief introduction to the procedure and purpose of the study was given to all pupils. At the first point of measurement (pre-test; T1) data on experience in golf, sex and resilience were gathered. At the second point of measurement (post-test; T2) data on resilience was collected again.

### 2.3. Questionnaires

Schumacher, Leppert, Gunzelmann, Strauß, and Brähler (2004) developed the shortened form of resilience scale (RS-11). It measures resilience as a personality factor, which characterises psychological resistance against long-term stressors and health-endangering ('risky') living conditions. The trait is thus construed as a personal resource. The questionnaire is based on the translation of the original English scale by Wagnild and Young (1993). The RS-11 was later shortened to 11 items without any loss of diagnostically relevant information: the original 'personal competence' subscale comprises nine items and 'acceptance and self and life' contains a further two. All items are evaluated with a

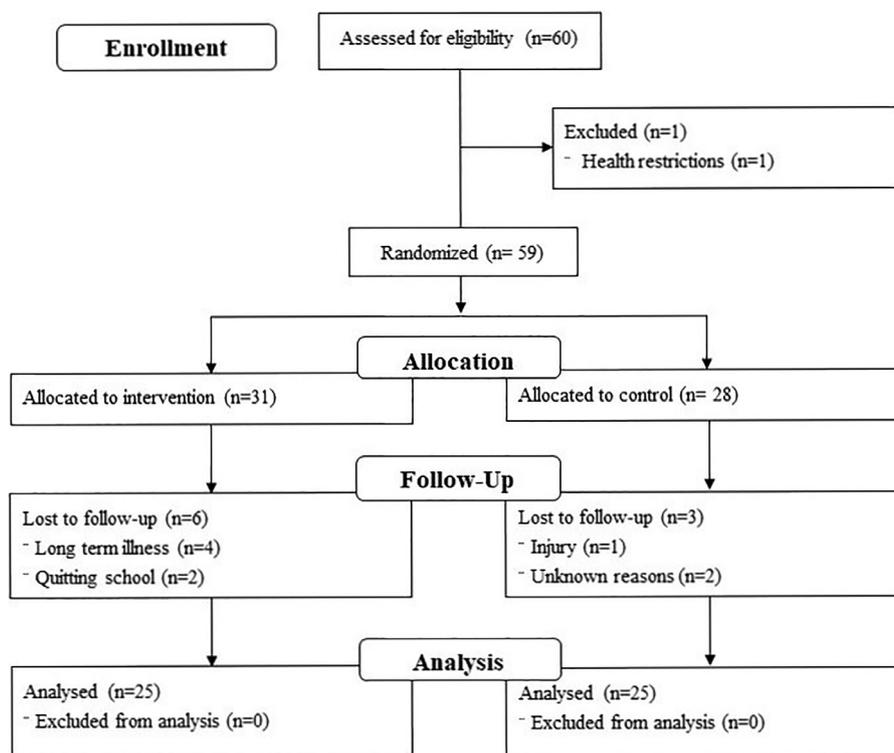


Fig. 1. Adapted study flow diagram.

seven-point response format, from (1) ‘No, I do not agree’ to (8) ‘Yes, I fully agree’. The questions were introduced by the following phrase: ‘This is about your personal opinions and feelings. Please tick the box that is most appropriate for you’. The RS-11 displayed an internal consistency of Cronbach’s alpha between 0.91 (Schumacher et al., 2004) and 0.92 (Kocalevent et al., 2015)

2.4. Data Analysis

Statistical analysis was performed using SPSS for Windows (version 20.0; IBM; Chicago Illinois). Analysis of variance (ANOVA) with repeated measures was used to detect group differences in the development of resilience. Significance level was set at  $p < 0.05$ .

3. Results

Table 1 displays the results of the descriptive analysis.

At T1 mean resilience for CG was 5.524 ( $SD = 0.724$ ), whereas mean resilience for IG was 5.335 ( $SD = 0.521$ ). The difference of resilience of the two groups was statistical significant ( $T = 10.561$ ;  $p < 0.001$ ). At T2 mean resilience for CG ( $M = 4.931$ ;  $SD = 0.321$ ) and IG ( $M = 5.909$ ;  $SD = 0.411$ ) showed statistical significant difference ( $T = 11.564$ ;  $p < 0.001$ ). The CG showed significant decline of resilience ( $p = 0.021$ ), whereas resilience of IG significantly improved from T1 to T2 ( $p < 0.001$ ).

Table 2 summarizes the results of the repeated measurements-

Table 1  
Descriptive statistic of control- and intervention group.

	Control group	Intervention group
N	25	25
Male	12	11
Mean age in years (SD)	10.040 ( ± 1.910)	10.440 ( ± 0.571)
Golf experience (in %)*	44.00	36.00

\* Pupils, who played at least golf once.

Table 2  
Repeated measures analyses of variance.

Effect	Sum of squares	df	Mean of squares	F	p	Cohen’s d
Group	2060.821	1	2060.824	174.256	0.000	0.311
Time	54.082	1	54.084	2.901	0.095	0.010
Group * time	2625.831	22	119.368	1208.482	0.000	2.041

ANOVA analysis. There is no significant change in the resilience score across time,  $F(1,49) = 2.901$ ,  $p = 0.095$ . In contrast, interaction between group and time was found to be significant  $F(22,49) = 119.368$ ,  $p < 0.001$ ,  $Cohen’s d = 2.041$ .

4. Discussion

During the intervention period, the CG’s resilience decreased, while the IG saw an improvement. It is assumed that resilience is not innate, but can be developed through interaction between the individual and the environment, depending on experiences, events and the coping thereof (Masten, 2001). A possible approach to improving this trait is to promote it at an individual level, which includes the further encouragement of problem-solving skills or self-efficacy. Golf enables pupils to exercise these areas due to the lack of direct opponents and comparatively minor time pressure. It is a low-risk, goal-oriented and manageable sport with a positive effect on resilience.

4.1. Limitations of the study

The results of the present study should not be generalised, but ought to be interpreted in relation to the specific sample and conditions. At the time of the survey, all the participants were attending the fifth grade in secondary school, and the control group received only soccer training. The positive impact of golf should therefore be interpreted in relation to soccer and should consider the specific age of the sample. Furthermore, the coach might have suspected the hypothesis of the

study, because all lessons (soccer and golf) were led by the same trainer and he was informed about the title of the sport lessons ('Abschlag Schule'). Further studies should examine the effect of golf compared to other sports and increase the sample size.

## 5. Conclusion

The present study has succeeded in gaining initial insights into the effects of regular golf training on the development of children's resilience. Opinions differ, however, on whether resilience should be interpreted as a stable personality factor or one that can be acquired and changed in the course of one's life. The present study shows that it can be modified during a child's development and increased by specific support measures. The influence of golf on its development is of great practical importance: through the characteristics of the sport (low influence of opponents, hardly little time pressure, outdoor activity), golf can contribute positively to mental health. Especially during the transition from childhood to adolescence, pupils are exposed to greater academic demands, hormonal changes and higher levels of stress: factors that can endanger physical and mental health. The promotion of children's well-being should begin as early as possible to mitigate or prevent negative consequences later in life. Finally, a recommendation for schools may be participate in the 'Abschlag Schule' project and thus extend their sports portfolio to include golf. Participation in the project is free for all schools and cooperation with golf clubs provide both training grounds and necessary materials. Alternatively, schools located near golf courses may wish to implement their own golf programmes.

## Conflict of interest statement

The authors whose names are listed below certify that they have no affiliations with or involvement in any organization of entity with any financial interest (such as honoraria, educational grants, participation speakers' bureaus, membership, employment, consultancies, stock ownership, or other equity interest; any expert testimony or patent-licensing arrangements), or no financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

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