Journal of Youth and Adolescence
https://doi.org/10.1007/s10964-021-01513-0

EMPIRICAL RESEARCH

Evaluating a Sport-Based Mental Health Literacy Intervention in Australian Amateur Sporting Adolescents

Brittany Patafio[1] · David Skvarc[1] · Peter Miller[1] · Shannon Hyder[1]

Received: 14 September 2021 / Accepted: 27 September 2021

Abstract

Youth amateur sporting environments present an untapped, under-researched, and potentially vital avenue for targeted mental health intervention programs. This study evaluates such an intervention in 12 sporting clubs, comprising of 330 Australian youth aged 12–15 years ($M = 13.73$, $SD = 0.79$). Mental health literacy, help-seeking intentions, and help-seeking behaviors were measured throughout the season using a repeated-measures experimental-control design. Multilevel modelling revealed the intervention successfully improved mental health literacy and help-seeking intentions in particular cohorts, such as youth scoring low in these constructs pre-intervention and youth who had not previously received the intervention. This study demonstrates the efficacy of interventions to effect positive change in amateur sporting youth, highlighting a convenient method to improve mental health in young people.

Keywords Mental health literacy · Help-seeking · Sport · Psychoeducation · Intervention

Introduction

Mental disorders have a global prevalence of approximately one in seven people (Ritchie and Roser 2018). Across the world, mental disorders account for 5–10% of the global disease burden (Ritchie and Roser 2018), however they account for 16% of the global burden of disease and injury in young people (10–19 years) (World Health Organization 2020) and contribute up to 45% of years lost due to disability in young people below 25 years (Gore et al. 2011). Addressing and supporting mental health within society is therefore essential, with education surrounding mental health literacy often targeted to ensure people are aware of, and feel equipped to manage, mental health issues that arise for themselves or others. Mental health literacy refers to one's ability to recognize the signs and symptoms of mental illness, understand the risk factors for mental illness, know what help-seeking options and treatments are available, and be able to provide support to peers experiencing mental health issues (Jorm 2012; Jorm et al. 1997). Crucially, the nature of mental health literacy as a teachable construct presents a useful intervention opportunity. Interventions aiming to improve mental health literacy in youth are not uncommon given that between one third (Solmi et al. 2021) and half (World Health Organization 2020) of all mental disorders begin by age 14, while between 62 and 75% of disorders emerge before 25 years (Jones 2013; Solmi et al. 2021). However, a gap in the literature exists concerning where these interventions take place, with great potential to expand this field by reaching and engaging young people in multiple avenues. Past reviews have suggested that targeted, context-specific intervention is needed outside the school setting, and specifically identified community-based interventions as an under-researched opportunity to reach youth engaged in activities and environments outside of school (Breslin et al. 2017; Patafio et al. 2021). The current study examines the impact of a mental health literacy intervention delivered to Australian amateur sporting youth.

Experiencing mental health problems early in life has been shown to have severe consequences for individual's quality of life and wellbeing, including poorer social functioning, increased substance abuse/misuse, impaired academic performance/achievement, unemployment (McGorry et al. 2014; Ritchie and Roser 2018), and a higher risk of suicide and self-harm (Martin et al. 2010; Ritchie and Roser 2018). Young people also face significant barriers to

✉ Brittany Patafio
brittany.patafio@deakin.edu.au

[1] School of Psychology, Faculty of Health, Deakin University Geelong, Waterfront Campus, Locked Bag 20001, Geelong, VIC 3220, Australia

Published online: 09 October 2021

help-seeking and treatment, such as difficulty recognizing mental health issues, lacking knowledge about where and how to get help, and perceived social stigma or embarrassment (Lawrence et al. 2015; Radez et al. 2020). Research suggests that high levels of mental health literacy (Rickwood et al. 2007) and prior mental health experience (Gulliver et al. 2010; Leighton 2010) increases the likelihood of young people recognizing and feeling equipped to seek support for mental health problems, and that youth low in these constructs are particularly vulnerable to reduced mental wellbeing. As such, mental health prevention and promotion interventions focused on improving mental health literacy have been proposed as an effective way to promote better mental health in youth, more broadly.

Mental Health Literacy Interventions

A recent review of interventions/programs targeting mental health prevention and promotion for young people has demonstrated that mental health literacy programs are highly effective, with positive post-intervention improvements seen in 75–90% of studies measuring mental health literacy, and improvements in 22–63% of studies measuring attitudes and stigma more specifically (Patafio et al. 2021). However, much of this research has focussed on interventions within schools and contains critical methodological flaws such as having no control group, not employing long-term follow-up procedures, or not adequately investigating the impact of interventions on help-seeking constructs (Patafio et al. 2021). Likewise, while schools are well-placed to reach and distribute information to large numbers of young people, interventions delivered in other contexts, such as within the community, may be able to deliver mental health information differently, or better reach youth who are less engaged within a formal school setting (Patafio et al. 2021). Targeted intervention in this manner is in line with a review by Breslin et al. (2017), which emphasizes the demand for context-specific programs within this area to promote positive mental health attitudes and behaviors for a broader range of youth. It is therefore important to consider the ability for interventions held in contexts outside of school as a way to increase mental health literacy and help-seeking in youth in addition to those initiatives implemented within schools. Sporting environments are one such setting within the community which is generally under-researched but possesses an enormous engagement potential with young people.

Mental Health and Sport

At least one-third of children and adolescents participate in organized sport worldwide (Aubert et al. 2018), with participation rates especially high in high-income countries such as Denmark (80–86%), Canada and Sweden (74–79%), and Australia and New Zealand (60–73%) (Aubert et al. 2018). Participation in sport has a complicated relationship with mental wellbeing, with numerous associated positive mental health outcomes noted in the literature such as reduced levels of psychological distress (Eime et al. 2013; Street et al., 2007), higher social functioning and self-esteem (Eime et al. 2013; Lubans et al. 2016), increased development of persistence, problem-solving skills, teamwork (Danish et al. 2003), and strengthened self-identity (Green and Jones 2005). However, participation in organized sport is also associated with adverse outcomes for some people, particularly when the sporting environment's internal culture promotes mental toughness and a sense of disapproval for displaying weakness (Bauman 2016; Doherty et al. 2016). Consequently, this can create an environment whereby mental health is stigmatized and not appropriately addressed or spoken about (Bauman 2016). Such an environment represents a substantial barrier to young people accessing timely support for mental health problems, resulting in fear that teammates and coaches will consider them weak for seeking help (Gulliver et al. 2012; López and Levy 2013), or that seeking help will negatively impact sporting career plans (Breslin et al. 2017). Unfortunately, these fears often outweigh the benefits of seeking help for many players (Bauman 2016).

Poor mental health literacy exacerbates this culture of mental toughness and its subsequent impact on help-seeking within the sporting context, wherein a lack of knowledge to guide and promote positive attitudes toward mental health and help-seeking within sporting clubs restricts player's ability to seek advice and healthily address problems. Instead, feelings of shame and fear about how other people within the sporting club (i.e., teammates, coaches) will react may manifest and discourage players from seeking support when required (Bauman 2016). However, sports culture is not permanent or unchangeable; the sporting environment can be an ideal place to address and promote mental health. Sporting clubs contain an engaged social network of people, including players, parents, coaches, and volunteers (Breslin et al. 2017; Hurley et al. 2017). Further, given young people involved in organized sport typically engage with the sport for 2–3 days each week (i.e., training and games), this context represents a promising avenue outside the schooling context that young people can trust and engage with when experiencing difficulties.

Mental Health Literacy Interventions in Sport Settings

Research investigating the impact of mental health prevention/promotion interventions within community settings such as sporting clubs is limited (Breslin et al. 2017; Patafio et al. 2021). There has been some research examining

sport-based interventions in elite athletes (e.g., Breslin et al. 2017), while other studies have investigated the indirect effects of mental health literacy interventions on youth by educating coaches, sporting staff (Breslin et al. 2017; Pierce et al. 2010; Sebbens et al. 2016) and parents (Hurley et al. 2018). However, there has been minimal research examining such mental health literacy interventions for amateur sporting adolescents directly. Within the current study, amateur sport represents competitive sporting environments, similar to that of professional sport, but just undertaken by non-professionals. Notably, there has been two Australian studies focusing on the amateur sporting youth population; Liddle et al. (2019) ($n = 102$) and Vella et al. (2021) ($n = 816$); which have found promising effects from brief (i.e., 45 min) mental health literacy interventions, including improvements in knowledge of mental illness, intentions to help a friend who is experiencing a mental health problem, help-seeking attitudes (Liddle et al. 2019), depression and anxiety literacy, formal help-seeking intentions, and confidence seeking help (Vella et al. 2021). However, the research in this field (mental health literacy interventions in sport settings) is in its infancy and needs replication to further understand the impact that such interventions can have on young people. There are also key limitations of this minimal existing research, including possible sampling bias (e.g., only sampling from one sporting team [Liddle et al. 2019] or only from clubs who accepted the invitation to be involved in the study [Vella et al. 2021]) and focusing solely on male sporting players (or educating adults linked with male sporting players). Further research is therefore needed to strengthen our understanding of the impact of mental health literacy interventions targeting non-elite (amateur) and female sporting youth. Investigating such interventions within an amateur sporting context is important given the vast majority of young people involved in sport are not elite athletes; therefore non-professional (amateur) sporting clubs might represent one of the most consistent social networking opportunities that a young person has outside of school, and an opportunity to reach and educate youth concerning this important topic in a different environment.

The Current Study

Research concerning interventions to improve mental health literacy and help-seeking in youth have mainly been delivered in school settings, however providing such mental health and help-seeking information in alternative environments may better engage some youth, and further emphasize the importance of mental health and wellbeing. The aim of this study is to examine the effectiveness of a brief psychoeducational mental health literacy intervention, Read the Play, which is delivered within amateur sporting environments. Specifically, the current study will examine the impact of Read the Play on amateur sporting adolescents' mental health literacy (in particular, focusing on mood disorders, anxiety disorders, suicide, substance use, and personality disorders) and help-seeking intentions and behavior. It is hypothesized that the Read the Play intervention will improve adolescents' mental health literacy and help-seeking intentions, with greater effects seen for youth who have not been exposed to this information before (hypothesis 1). Further, the current study will address past research limitations by investigating help-seeking behaviors and incorporating follow-up testing procedures, wherein it is predicted that help-seeking behaviors will increase over time (hypothesis 2). Finally, it is hypothesized that the effects of Read the Play will be present across the sample overall and in several vulnerable groups, including youth with low baseline scores in key constructs and youth without prior mental health experience (hypothesis 3).

Method

Participants and Sample

A convenience sample of 12 football and netball sporting clubs (under 15 age division) within the Geelong (Victoria, Australia) region were utilized for this study; 10 were categorized as the "experimental group" ($n = 272$), and two were categorized as the "control group" ($n = 58$). In Australia, junior sport age-groups are determined by players being, as of midnight on the 31st of December prior to the season, under the age division specified. Therefore, players must be 14 years old or younger at the start of the year to be eligible for the under-15 age division (but can turn 15 during the season). A non-treatment comparison condition was not ethically possible given the pre-existing nature of Read the Play within the sample community. Therefore, all clubs received the intervention, and a small "pseudo-wait-list" control group was used to control potential confounds that might influence the level of mental health literacy in the absence of intervention. Control group clubs participated in one additional baseline survey before receiving Read the Play to allow immediate intervention effect comparisons between experimental and control conditions. While unbalanced designs often diminish statistical power in mixed models, the power reduction is minor if the imbalance is not too severe (approximate imbalance of 1:7 control: intervention) and the sizes of each group are not too small (Hutchins et al. 2015; Konstantopoulos 2010). In addition, power simulations in R were performed (R Core Team 2013) (see Appendix A) to approximate statistical power for moderate effect sizes with 1:6 imbalance and achieved

>80% power. The current study's ratio of 1:5 is thus suitable for the intended analyses.

The sample included 330 participants aged between 12 and 15 years ($M = 13.73$, SD = 0.79). Fifty-eight per cent of participants identified as male ($n = 192$), with remaining participants identifying as female. Informed consent was obtained from all participants' parent/guardian before data collection and assent from all eligible participants at each survey. Non-participation at each stage was due to not having parental consent, or youth not being present at their sports training at the time of visitation from the research team. Due to this, addressing loss at follow-up was difficult to control (as surveys were completed in person), however participation was monitored at each time point to ensure attrition was appropriately recorded. Five-hundred and four consent forms were distributed, with 388 (77%) returned in total. The response rate for eligible participants (i.e., participants with consent to participate) in the experimental group was approximately 71% at baseline and immediate post surveys, then dropping to 50% at follow-up. The response rate for eligible participants in the control group was approximately 63% at both baseline surveys and immediate post-survey, then dropping to 45% at follow-up. There were no significant differences between youth that completed all surveys throughout the study and those who only completed some of the surveys across key constructs (i.e., mental health literacy and help-seeking), gender, and age-category (see Table 1). There was a significant difference in raw age distribution; however, further examination via Gabriel post-hoc analyses (this post-hoc test was chosen as it accounts for unequal sample sizes between groups; Field 2013i) revealed that participants completing survey 1 only ($M = 14.09$ years) were significantly older than those who completed survey 2 only ($M = 13.55$ years) or those completing surveys 1 and 2 ($M = 13.64$ years), with no significant differences between participants who did not complete all surveys and those that did complete all surveys. Overall, this suggests that no biases resulted due to dropout at follow-up.

Intervention

Read the Play is a single-session, 1 h psychoeducational intervention delivered by a mental health professional within sporting clubs to educate adolescents about mental health (in particular, mood disorders, anxiety disorders, suicide, substance use, and personality disorders) and accessing support if/when needed. Read the Play is designed for sporting adolescents within the under-15 age division and includes a PowerPoint presentation, facilitated discussions with a mental health professional, and games/activities to engage young people in the topic. Participants are in teams to complete games/activities and earn "points";

Table 1 Differences between youth completing some surveys and youth completing all surveys

Surveys completed	Age category (%)		Mean age (SD)	Gender (%)		Mental health literacy[a]	Help-seeking overall[a]	Help-seeking informal[a]	Help-seeking formal[a]	Help-seeking sport-related[a]
	Young	Old		Male	Female					
Survey 1 only ($n = 33$)	6 (19%)	26 (81%)	14.09 (0.77)	17 (52%)	16 (48%)	126.58	4.69	4.88	4.41	4.06
Survey 2 only ($n = 29$)	13 (45%)	16 (55%)	13.55 (0.74)	14 (48%)	15 (52%)	123.69	4.91	5.02	4.75	4.52
Both survey 1 and 2 ($n = 76$)	31 (41%)	45 (59%)	13.64 (0.74)	36 (47%)	40 (53%)	122.84[b]	4.86[b]	5.05[b]	4.57[b]	4.33[b]
All 3 surveys ($n = 134$)	48 (36%)	84 (63%)	13.77 (0.83)	85 (63%)	49 (37%)	122.05[b]	5.03[b]	5.14[b]	4.82[b]	4.59[b]
Difference between groups	$\chi^2 = 5.83 p = 0.12$		$F = 3.10$ $p = 0.03$	$\chi^2 = 6.27 p = 0.10$		$F = 1.42$ $p = 0.24$	$F = 1.68$ $p = 0.17$	$F = 1.08$ $p = 0.36$	$F = 1.92$ $p = 0.13$	$F = 2.16$ $p = 0.09$

[a]Average scores within each construct

[b]Weighted average mean score

thus, the competitive nature of sporting youth is used to engage youth in the content of the intervention. At the end of the session, facilitators provide participants with a card detailing help-sources within the local community. There are two slightly different Read the Play sessions, which include similar messages using different games/activities, to account for players receiving Read the Play twice while in the under-15 age division. A summary of these activities is provided in Appendix B. Further, a unique aspect of Read the Play is incorporating a localized support person within each sporting club, known as a Player Wellbeing Officer, who offers an avenue of support to access if needed. Player Wellbeing Officers are provided basic mental health training, including knowledge of support options in the local community, and their role is to be available to support youth and adults within their club.

Measures

Demographics

Participants reported their age, gender, sport/s they partake in, the sporting club they currently play at, mental health experience, and postcode. Mental health experience in the current study was inclusive of indirect (i.e., knowing someone who has experienced mental health problems) and direct (i.e., current or previous personal experience with mental health problems) experiences. Postcodes were used to calculate socioeconomic status (SES) using the Socio-economic Indexes for Areas [SEIFA] Index of Relative Socio-economic Disadvantage [IRSD] guidelines (Australian Bureau of Statistics 2016).

Mental health literacy

Mental health literacy was measured using the Mental Health Literacy Scale (MHLS; O'Connor and Casey 2015); a 35-item scale developed in Australia to address all mental health literacy facets in a survey format. The MHLS demonstrates good reliability in adult ($\alpha = 0.87$; O'Connor and Casey 2015) and adolescent ($\alpha = 0.80$; Recto and Champion 2017) populations. The creator of the MHLS suggested two modifications to the scale before use in this study, resulting in question five describing "Persistent Depressive Disorder (Dysthymia)" rather than "Dysthymia", and question eight describing "Substance Abuse Disorder" rather than "Drug Dependence". Further modifications were made to the scale regarding negatively-phrased stigma questions which were rephrased into positively-framed stigma questions at the ethics committee's request. The MHLS examines mental health knowledge and understanding, mental health stereotypes and attitudes, and help-seeking skills. Responses were rated on different four-point and five-point Likert scales depending on the question being asked, ranging from "Very Unlikely" to "Very Likely" or "Strongly Disagree" to "Strongly Agree". Three items (10, 12 and 15) were reverse coded. An overall mental health literacy score was calculated at each time point by summing participant responses, with higher scores indicating higher mental health literacy. Scores ranged from 35 to 160. The MHLS demonstrated good reliability in the current study (baseline: $\alpha = 0.84$, immediate post: $\alpha = 0.82$, follow-up: $\alpha = 0.89$).

Help-seeking intentions

Help-seeking intentions were examined via the General Help-Seeking Questionnaire (GHSQ; Wilson et al. 2005), which asks participants to indicate how likely they would seek help/advice from an array of people if experiencing a mental health problem. For the current study, 11 different help-sources were included plus space to specify a help-source not captured in the options provided. Responses were rated on a seven-point Likert scale ranging from 1 (extremely unlikely) to 7 (extremely likely), with higher scores indicating greater intentions to seek help from that help-source. Due to the flexibility in scoring for the GHSQ (Deane and Wilson 2007), multiple ways to measure the current study's construct were used. First, help-seeking intentions were scored on a single scale, whereby responses to all help-source options were averaged at each time point. Second, help-sources were separated into "formal" (inclusive of mental health professionals, phone help-lines, a doctor/GP, and teachers) and "informal" (inclusive of a partner, friends, a parent/guardian, other relatives/family members, a sports coach, and their club Player Wellbeing Officer) groups, with the average of responses under each respective sub-category formulating "formal" help-seeking and "informal" help-seeking scales. Finally, due to the focus on sporting environments in the current study, a separate sport-related scale was created, including the average of scores from the sports coach and Player Wellbeing Officer help-source options. Scored as a single scale, the GHSQ demonstrates good reliability in previous studies ($\alpha = 0.85$; Wilson et al. 2005) and the current study (baseline: $\alpha = 0.74$, immediate post: $\alpha = 0.91$, follow-up: $\alpha = 0.69$). Scored using separate scales, the GHSQ demonstrates good reliability in previous studies ($\alpha = 0.70$–0.83; Wilson et al. 2005) and for informal and sport-related scales in the current study (informal help-seeking: $\alpha = 0.79$ [baseline], $\alpha = 0.80$ [immediate post], and $\alpha = 0.90$ [follow-up]; sport-related help-seeking: $\alpha = 0.74$ [baseline], $\alpha = 0.79$ [immediate post], and $\alpha = 0.79$ [follow-up]). Internal reliability was poor at various time points for the formal help-seeking scale in the current study. Exploration of removing items to improve internal consistency showed no

consistent improvement across time points, therefore tentative interpretation of this subscale is advised (baseline: $\alpha = 0.63$, immediate post: $\alpha = 0.84$, follow-up: $\alpha = 0.37$).

Help-seeking behaviors

Help-seeking behaviors were measured via the Actual Help-Seeking Questionnaire (AHSQ; adapted from Rickwood and Braithwaite 1994). The AHSQ asks participants to indicate if they have sought help/advice from an array of people for a mental health problem, and if so, to briefly describe the problem for which they sought help/advice. The 11 help-source options utilized in the AHSQ for the current study mimic those presented in the GHSQ (see above). If participants had not sought help/advice from one or more of the help-source options, they were instructed to leave that section of the AHSQ blank. Each help-source option was treated as a dichotomous (yes/no) variable.

Procedure

Before data collection ethics approval was obtained. This project was also developed according to the principles of the STROBE statement (Von Elm et al. 2007). Junior coordinators of all Geelong-based football and netball clubs were approached by way of email inviting their under-15 football and netball team/s to be involved in the study. Participating clubs were visited 4–5 times throughout the 2019 sporting season (between April and November; See Fig. 1 for an overview of the timeline in the current study).

First, the research team members visited to explain the study and distribute recruitment information, including consent forms. Parent/guardian consent could be provided by returning a signed form to their child's sporting club or the research team directly (via mail), or via an online form available through Qualtrics. Subsequent visitations to each club were to administer baseline, immediate post-intervention, and follow-up surveys. Baseline surveys were administered 1–6 weeks ($M = 3$ weeks) following the first visit from the research team, with the timing being mostly dependent on the number of consent forms returned at each club. Participants in the control group received an additional baseline survey approximately two weeks after their initial baseline survey. Immediate post-Read the Play surveys were administered following each club's Read the Play session. Follow-up surveys were administered 2–8 weeks ($M = 4.5$ weeks) after each club's Read the Play session. Participant assent was sought for each survey, and support service handouts (detailing where to go for help if needed) were provided to all participants following each survey. Participation was anonymous, however participant responses were monitored over the survey time points by using a unique code, which was stored in a separate password-protected excel document to match responses across time. Following each survey, participants were put into a prize draw for a $30 JB-HI-FI voucher, with one winner being randomly drawn and announced on the night for every 10 surveys completed. The survey took ~20 min to complete.

Data Analytic Strategy

A repeated measures experimental-control study design was utilized to evaluate the effect of participant's receiving the Read the Play intervention. SPSS v26 was used to conduct data analysis. Missing data analyses (Little's MCAR test; Little 1988) revealed that the data were missing completely at random for all variables of interest at each time point. Cases with missing data were individually inspected, with most cases displaying small amounts of missingness across each measure (ranging from 2 to 10%). Expectancy Maximization was used as a

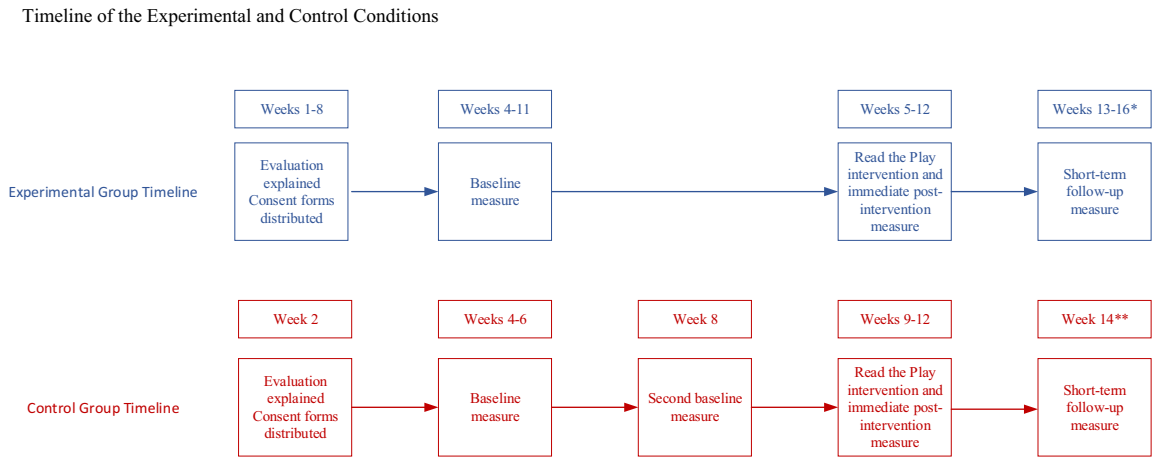

Fig. 1 Timeline of the Experimental and Control Conditions. *Note*. Week 1 refers to the week of April 29–May 3, 2019. *Eight of the ten experimental group clubs completed short-term follow-up. **One of the two control group clubs completed short-term follow-up

Table 2 Number of participants with missing data for each variable

Survey	Mental health literacy		Help-seeking intentions	
	Participants with missing data	Number of corrections to items within the scale	Participants with missing data	Number of corrections to items within the scale
Baseline	54 (3)	102	19 (1)	18
Baseline[a]	8	18	3	3
Immediate post	33	65	13	14
Follow up	19	40	12	14

Numbers in brackets represent how many cases with more than 50% of items missing were deleted

[a]Control group only

replacement technique for these cases, which is deemed an appropriate method for handling missing data when missingness is not >20% (Garson 2015). Table 2 highlights the number of participants with missing data as well as the number of corrections made across the time points. There were four cases with larger amounts of missing data (i.e., with >50% of items missing on a scale). These cases were deleted, as research indicates a substantial increase in bias when imputation methods are used for cases with greater than 20% missingness (Stavseth et al. 2019) or 40% missingness (Jakobsen et al. 2017).

Linear mixed models (multilevel modelling) were used to account for clustering effects at the club level. This decision was made for two reasons. First, each club was an independent cluster in the current study, such that each participant was only affiliated with one club for the sporting season. Second, it was expected that sporting clubs will display different cultures and approaches to promoting mental wellbeing, mental health literacy, and help-seeking within their club. As such, it is anticipated that there will be differences between the support offered by coaches and Player Wellbeing Officers within each club (as a result of individual differences, how much they promote mental health and make themselves available to youth, as well as how clubs interpret the importance of what Read the Play are promoting), thus we expected a club effect. To account for this, individuals were clustered within sporting clubs. To ensure the appropriateness of this choice, between-group variance was examined via Intraclass Correlation Coefficients (ICCs). For all outcomes of interest in the current study this between-group variance was significant, and ICCs were high (ranging from 0.35 to 0.60). Thus, the use of multilevel modelling was necessary to account for this clustered data, as ignoring such would result in an increased likelihood of Type 1 errors and overall inaccurate conclusions (Musca et al. 2011). Help-seeking behaviors were examined using *z*-tests of proportions to assess change over time for each help-source.

Data were analyzed according to an immediate effect (differences between baseline and immediate post-Read the Play data) and a short-term effect (differences between immediate post-Read the Play and follow-up). Comparisons between experimental and control conditions were made for the immediate effect analyses only due to ethical and methodological reasons outlined above. Further, overall change across the entire sample and change across particular cohorts (i.e., gender and particularly vulnerable groups) were examined. Vulnerable groups are categorized by baseline levels of key mental health outcomes and youth without prior mental health experience. Low scoring youth were identified as being below the median baseline score of each major outcome (see Table 3). This was considered appropriate as there are no cut-point norms/standards for the mental health literacy or help-seeking measures used in this study, however the intention is to investigate a conceptually discrete group (DeCoster et al., 2009; DeCoster et al., 2011; Iacobucci et al., 2014). This decision was made knowingly in regards the implications for power, however a post hoc examination of the current study's findings suggests no issues regarding Type 2 errors for results pertaining to these groupings.

Two further cohorts were examined for methodological reasons; given the Read the Play program is run yearly, age (bottom and top age players) needed to be separately examined to account for potential bias resulting from some participants (i.e., top age players) experiencing the Read the Play program the previous year. Exploratory combinations of the cohorts analyzed were also chosen for examination a priori (e.g., male low scorers). It was decided that the alpha level of these analyses would not be adjusted given the evaluation's exploratory nature. While it is appreciated that this may increase the likelihood of making a Type 1 error, adjusting the alpha level may result in increasing the chance of making a Type 2 error, which is considered a more severe error to make in the context of findings concerning a mental health literacy intervention. However, to overcome the possibility of Type 1 errors, standardized effect sizes (Cohens d) which consider unequal group sizes are utilized

to avoid over-interpretation of data (Wilson, n.d), and indication of whether each significant finding meets the recommended minimum effect size (RMPE) representing a "practically" significant effect for social science data (Ferguson 2016) is also considered.

Results

Demographics and Bivariate Associations

Participants ranged from 12 to 15 years, with the majority of participants being 14 years old (47%; $n = 155$), followed by 13 years (31%; $n = 103$), 15 years (16%; $n = 51$), and 12 years (6%; $n = 18$). Participants identified as either male (58%; $n = 192$) or female (42%, $n = 138$). Using SEIFA guidelines (Australian Bureau of Statistics 2016), participants in the current sample were mainly defined as belonging to the mid-SES group (89%; $n = 292$), followed by low-SES (8%; $n = 25$) and high-SES (3%; $n = 10$). Over half of participants reported having no prior mental health experience (53%; $n = 174$). Football was the most commonly reported sport that participants played (77%; $n = 253$), with smaller numbers of participants playing netball (18%; $n = 59$) or both football and netball (5%; $n = 17$). See Table 4 for bivariate associations between key variables prior to intervention.

Table 3 Classification of low scoring participants

Outcome	'Low scorer' categorization	Possible scale range	Sample size per time point
Mental health literacy	122 or below	35–160	T1: $n = 135$ (53%) T2: $n = 125$ (49%) T3: $n = 103$ (54%)
Help-seeking intentions	4.82 or below	1–7	T1: $n = 125$ (49%) T2: $n = 101$ (40%) T3: $n = 80$ (42%)
Help-seeking intentions (informal subscale)	5.14 or below	1–7	T1: $n = 121$ (48%) T2: $n = 113$ (45%) T3: $n = 84$ (44%)
Help-seeking intentions (formal subscale)	4.50 or below	1–7	T1: $n = 126$ (50%) T2: $n = 98$ (39%) T3: $n = 80$ (42%)
Help-seeking intentions (sport-related subscale)	4.00 or below	1–7	T1: $n = 130$ (51%) T2: $n = 98$ (39%) T3: $n = 81$ (42%)

Sample size per timepoint refers to the sample size within the low scorer category

Intervention Analyses

The following sections assess the immediate effect (baseline to immediate post-intervention) and short-term effect (sustainability of immediate post-intervention findings at follow-up) of the Read the Play intervention for all key outcome variables (mental health literacy, help-seeking intentions, and help-seeking behavior). Change across the entire sample and particular cohorts (i.e., top and bottom age youth, youth with low baseline scores in key constructs, youth without prior mental health experience) are examined.

Immediate effect of read the play

Time by condition multilevel modelling analyses revealed the immediate effect of the Read the Play intervention did not have a significant impact on the sample overall; i.e., mental health literacy: $F(1253.16) = 2.28$, $p = 0.13$; however, there were significant intervention effects observed across most key constructs (i.e., mental health literacy and help-seeking intentions) when examining particular cohorts individually

Table 4 Bivariate correlations between key variables at baseline

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Mental health literacy	1	0.33**	0.29**	0.32**	0.16*	0.36**	0.01	0.30**	0.25**
2. Help-seeking (overall)		1	0.93**	0.89**	0.82**	0.11	0.01	−0.07	−0.08
3. Help-seeking (informal)			1	0.66**	0.80**	0.05	−0.02	−0.09	−0.09
4. Help-seeking (formal)				1	0.68**	0.15*	0.05	−0.03	−0.05
5. Help-seeking (sport)					1	0.01	0.04	−0.11	−0.11
6. Confidence seeking help						1	0.05	0.18**	0.23**
7. Age[a]							1	−0.16**	0.16**
8. Gender[b]								1	0.23**
9. Prior mental health experience									1

[a]Due to the limited age range and use of this variable in subsequent analyses, this variable is dichotomized into bottom age and top age categories

[b]Gender is a dichotomous variable, with male coded as 1 and female coded as 2

*$p < 0.05$; **$p < 0.01$

Table 5 Key statistics for intervention effects within each key outcome across the sample overall and within particular cohorts

Cohort	Mental health literacy			Help-seeking intentions			Informal help-seeking intentions			Formal help-seeking intentions			Sport-related help-seeking intentions		
	n	*F* (d)	*p*	*n*	*F* (d)	*p*	*n*	*F* (d)	*p*	*n*	*F*	*p*	*n*	*F* (d)	*p*
Overall	324	2.28	0.13	322	1.09	0.30	322	0.92	0.34	322	1.02	0.31	322	0.78	0.38
Males	186	0.00	0.95	185	0.37	0.55	185	0.23	0.63	185	0.64	0.43	185	0.15	0.70
Females	138	5.59 (0.40)[a]	**0.02**	137	0.61	0.44	137	0.53	0.47	137	0.39	0.53	137	1.05	0.31
Bottom age	118	1.53	0.22	116	1.20	0.16	116	1.73	0.19	116	1.44	0.23	116	4.06 (0.37)[a]	**0.047**
Top age	203	1.19	0.28	203	0.02	0.89	203	0.01	0.91	203	0.11	0.74	203	0.07	0.80
Low scoring	137	4.92 (0.38)[a]	**0.03**	135	5.06 (0.39)[a]	**0.03**	134	5.80 (0.42)[a*]	**0.02**	135	3.04	0.08	140	6.28 (0.42)[a*]	**0.01**
No prior MH experience	171	2.38	0.13	170	0.69	0.41	170	0.38	0.54	170	0.90	0.35	170	0.80	0.37
Low scoring males	101	1.45	0.23	73	2.85	0.10	69	2.66	0.11	73	2.64	0.11	73	5.11 (0.53)[a*]	**0.03**
Low scoring females	36	1.66	0.21	62	1.48	0.23	65	2.41	0.98	62	0.89	0.35	67	1.97	0.17
Low scoring bottom age	51	0.80	0.38	47	4.36 (0.61)[a*]	**0.04**	41	3.07	0.09	47	2.23	0.14	52	5.76 (0.67)[b*]	**0.02**
Low scoring top age	84	4.81 (0.48)[a*]	**0.03**	85	1.89	0.69	90	2.66	0.11	85	0.86	0.36	85	1.94	0.17

MH mental health, *n* number of participants, *d* Cohen's d effect size (reported for significant findings)

[*]Refers to the recommended minimum effect size (RMPE) representing a "practically" significant effect for social science data (Ferguson 2016)

[a]Small effect

[b]Medium effect

Significant effects at $p < 0.05$ in bold

(Table 5). For example, significant intervention effects were observed in low scoring youth across mental health literacy; $F(1112.07) = 4.92$, $p = 0.03$, help-seeking intentions; $F(1100.10) = 5.06$, $p = 0.03$, informal help-seeking intentions; $F(1100.06) = 5.80$, $p = 0.02$, and sport-related help-seeking intentions; $F(1107.29) = 6.28$, $p = 0.01$. As such, additional exploratory analyses were conducted within this low scoring cohort (i.e., low scoring males; see Table 5). Breakdowns of these significant intervention effects (shown in Table 6 and Fig. 2) revealed significant improvements in key outcomes from baseline to post-intervention in the experimental group (but not in the control group) for all relevant cohorts except females when examining mental health literacy, which saw a significant reduction from baseline to post-intervention in the control group (but no significant changes in the experimental group).

Participants were also asked whether they had sought help for mental health issues, with reports of such help-seeking behavior assessed for change via *z*-tests of proportions. The proportion of change in reports of seeking help for a mental health issue did not significantly change for all help sources with one exception, seeking help from a parent/guardian, which significantly decreased from baseline to immediate post-intervention ($z = 2.51$, $p = 0.01$; Table 7).

Short-term effect of read the play

Multilevel modelling analyses revealed no significant change in levels of key mental health constructs from immediate post-Read the Play (survey 2) to follow-up (survey 3). This was observed for the sample overall (i.e., mental health literacy: $F(1201.89) = 1.75$, $p = 0.19$) and for all individually examined cohorts (i.e., low scoring mental health literacy: $F(1,95.14) = 1.61$, $p = 0.21$), and suggests that the significant immediate effects of the Read the Play intervention (outlined in the section above) were maintained for 2–8 weeks (see Table 8).

To determine the proportion of change for actual help-seeking behavior within each help source z-tests of proportions were conducted, whereby the proportion of change in reports of seeking help for a mental health issue did not significantly change for all help sources (see Table 7).

Discussion

Interventions aimed at improving mental health literacy and help-seeking in youth are not uncommon given that mental disorders are commonly developed during

Table 6 Comparison between baseline and immediate-post intervention levels of key constructs for cohorts with significant intervention effects

Cohort	Experimental condition					Control condition				
	M at T1 (CI)	M at T2 (CI)	*F*	*p*	*d*	M at T1 (CI)	M at T2 (CI)	*F*	*p*	*d*
Mental Health Literacy										
Females	125.98 (123.93–128.04)	127.55 (125.57–129.54)	2.19	0.14		130.60 (125.33–135.86)	124.99 (119.75–130.22)	7.16	**0.02**	0.58[a*]
Low scoring	113.18 (111.61–114.75)	118.28 (116.09–120.48)	26.06	**<0.001**	0.54[a*]	111.60 (108.28–114.92)	111.94 (107.35–116.53)	0.13	0.72	
Low scoring top age	112.72 (10.65–114.79)	118.32 (115.58–121.06)	19.17	**<0.001**	0.61[a*]	111.69 (107.42–115.96)	111.55 (106.08–117.01)	0.00	0.96	
Help-Seeking Intentions										
Low scoring	3.92 (3.78–4.06)	4.29 (4.06–4.51)	13.22	**0.001**	0.45[a*]	4.10 (3.86–4.34)	4.05 (3.67–4.44)	0.15	0.70	
Low scoring bottom age	3.93 (3.71–4.16)	4.40 (3.99–4.80)	6.85	**0.01**	0.55[a*]	4.15 (3.74–4.55)	3.89 (3.17–4.61)	1.00	0.34	
Informal Help-Seeking Intentions										
Low scoring	4.15 (4.01–4.29)	4.56 (4.34–4.79)	19.21	**<0.001**	0.50[a*]	4.19 (3.92–4.45)	0.16 (3.76–4.57)	0.00	0.98	
Sport-Related Help-Seeking Intentions										
Bottom age	4.28 (3.97–4.60)	4.76 (4.43–5.08)	8.26	**0.01**	0.32[a]	3.83 (3.11–4.55)	3.52 (2.76–4.28)	2.60	0.13	
Low scoring	3.04 (2.87–3.21)	3.90 (3.57–4.23)	26.37	**<0.001**	0.74[b*]	3.20 (2.89–3.50)	3.29 (2.73–3.84)	0.15	0.70	
Low scoring males	3.03 (2.76–3.30)	4.10 (3.58–4.61)	14.80	**<0.001**	0.89[b*]	3.11 (2.72–3.50)	3.25 (2.57–3.93)	0.27	0.61	
Low scoring bottom age	3.01 (2.74–3.28)	4.01 (3.49–4.53)	15.01	**<0.001**	0.86[b*]	3.13 (2.63–3.62)	2.90 (1.91–3.89)	0.80	0.39	

T1 refers to time point one, representing baseline (pre-intervention) testing; T2 refers to time point two, representing immediate post-intervention testing

M mean, *d* Cohen's d effect size (reported for significant findings), *CI* 95% confidence interval

[*]Refers to the recommended minimum effect size (RMPE) representing a "practically" significant effect for social science data (Ferguson 2016)

[a]Small effect

[b]Medium effect

Significant effects at $p < 0.05$ in bold

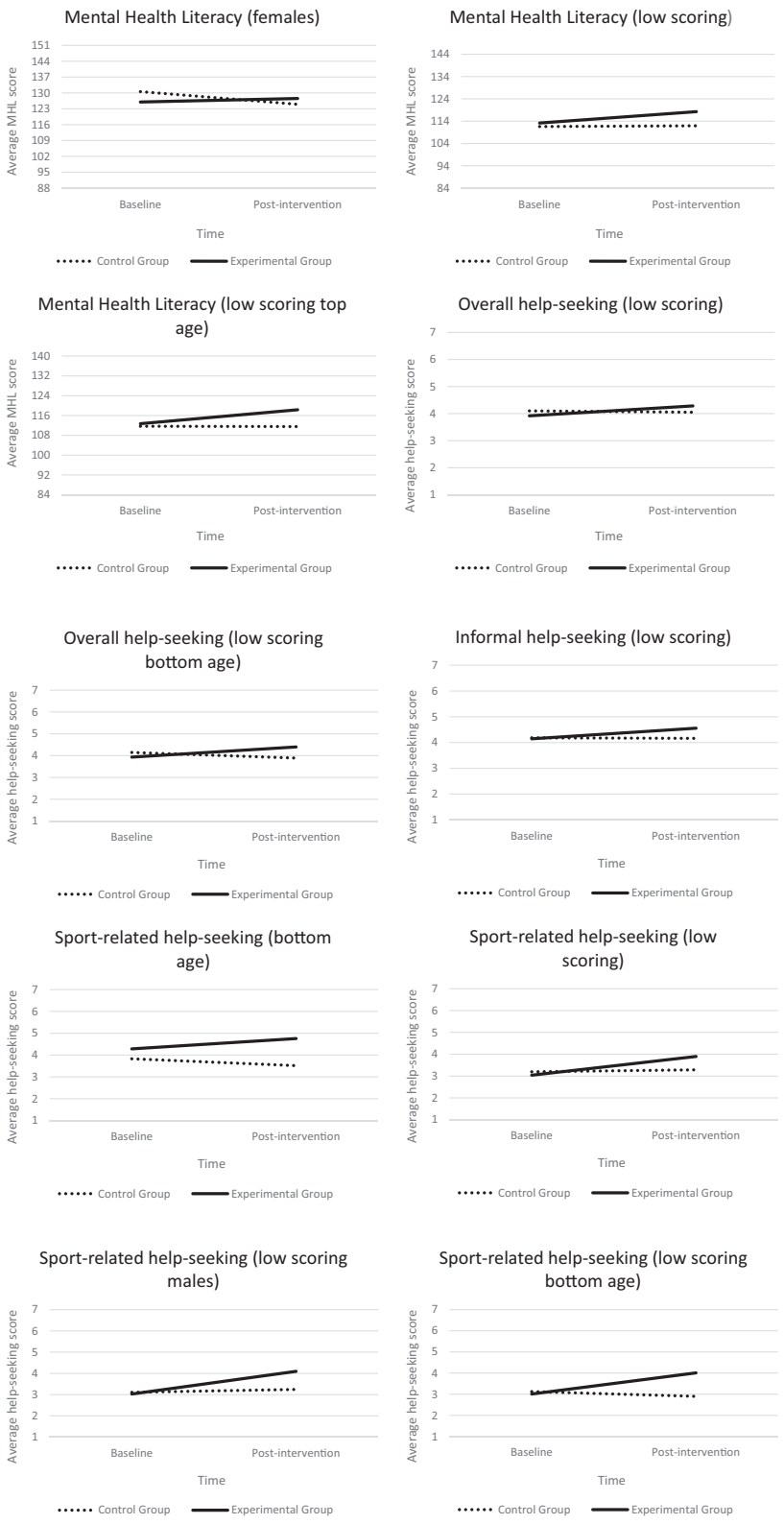

Fig. 2 Graphical Representations of the Comparison Between Experimental and Control Conditions for Cohorts with Significant Intervention Effects

adolescence. While most interventions to date have targeted youth in the schooling environment, there is a need to expand this field by reaching youth in multiple contexts. One such context that provides great promise is sport settings, however, the research to date within sport settings has rarely focused on amateur (non-professional) youth or female sporting youth. While it is noted that the current study is exploratory in nature, and would therefore benefit from replication, it was found that a brief psychoeducational intervention, Read the Play, effectively improved mental health literacy and help-seeking intentions in Australian sporting youth scoring low in these constructs pre-intervention and those who had not previously been exposed to Read the Play.

The current study's findings partially support the hypotheses made, with small to moderate intervention effects seen across mental health literacy and help-seeking intentions in bottom age and low scoring youth. While the sample overall did not significantly improve as a result of the intervention (contrary to hypothesis 3), results addressing certain cohorts within the sample suggest that the Read the Play intervention may be particularly useful for more vulnerable adolescents (i.e., those scoring low on key constructs; in line with hypothesis 3) and those receiving the intervention for the first time (i.e., for help-seeking intentions; in line with hypothesis 1). The improvements in youth who scored low in mental health literacy and help-seeking (in particular, informal help-seeking) at baseline suggest that Read the Play had an impact on youth most vulnerable to feeling incapable of seeking, or knowing where/how to seek, support when required (Rickwood et al. 2007). However, as this intervention seemed to be most helpful to the younger cohort (i.e., those receiving Read the Play for the first time), additional materials and ways of promoting help-seeking may need to be employed in alternate years to see continual improvement (i.e., in top age players). The impact of Read the Play was further examined based on gender and prior mental health experience; however, minimal change across key constructs in these cohorts were observed

Table 7 Frequency and percentage of actual help-seeking behaviors reported across time

Help-source	Baseline *n* (%N[a])	Immediate post-RTP *n* (%N[b])	Short-term follow-up *n* (%N[c])
Partner	44 (16%)	38 (14%)	32 (17%)
Friend	79 (29%)	63 (23%)	42 (22%)
Parent/ guardian	102 (38%)	74 (27%)*	51 (27%)
Other relative/ family member	48 (18%)	44 (16%)	30 (16%)
Mental health professional	71 (26%)	58 (21%)	35 (18%)
Phone help-line	30 (11%)	30 (11%)	25 (13%)
Doctor/GP	43 (16%)	36 (13%)	26 (14%)
Teacher	45 (17%)	40 (15%)	25 (13%)
Sports coach	29 (11%)	33 (12%)	22 (11%)
Player Wellbeing Officer	31 (11%)	25 (9%)	19 (10%)

RTP Read the Play, *n* number of participants outlining help-seeking behaviors at each time point, *%N* percentage of total number of participants who completed the survey at each time point

[a]N at baseline = 272

[b]N at immediate post-RTP = 270

[c]N at short-term follow-up = 192

*$p = 0.01$

Table 8 Comparison between immediate-post intervention and follow-up levels of key constructs for cohorts with significant intervention effects

Key outcome/cohort	Mean at T2 (CI)	Mean at T3 (CI)	*F*	*p*
Mental health literacy				
Females	127.36 (125.28–129.45)	127.08 (124.91–129.26)	0.06	0.81
Low scoring	117.56 (115.17–119.95)	115.80 (113.37–118.22)	1.61	0.21
Low scoring top age	118.54 (115.66–121.42)	116.12 (112.81–119.43)	1.66	0.20
Help-seeking intentions				
Low scoring	4.30 (4.08–4.52)	4.26 (4.04–4.47)	0.27	0.61
Low scoring bottom age	4.45 (4.07–4.83)	4.47 (4.15–4.78)	0.02	0.89
Informal help-seeking intentions				
Low scoring	4.52 (4.29–4.75)	4.49 (4.26–4.72)	0.10	0.76
Sport-related help-seeking intentions				
Bottom age	4.71 (4.40–5.02)	4.57 (4.24–4.90)	0.90	0.35
Low scoring	3.94 (3.63–4.26)	3.91 (3.61–4.21)	0.05	0.83
Low scoring males	4.05 (3.61–4.49)	3.72 (3.32–4.13)	2.61	0.11
Low scoring bottom age	4.07 (3.54–4.60)	4.13 (3.59–4.66)	0.06	0.81

T2 refers to time point two, representing immediate post-Read the Play testing; T3 refers to time point three, representing short-term follow-up testing

CI 95% confidence interval

(contrary to hypothesis 3). Interestingly, females significantly decreased in mental health literacy levels in the control condition while levels in the experimental group remained stable, therefore suggesting the Read the Play intervention may act as a protective factor for female sporting youth; perhaps something for future research to examine further.

While this single-session, one-hour intervention promoted change in particular cohorts of youth across most of the examined mental health constructs, it is important to note that there were no significant changes in formal help-seeking intentions (i.e., mental health professionals, doctors, teachers). However, this finding is not entirely unexpected for two reasons. First, the formal help-seeking intentions scale in the current study demonstrated poor internal consistency which may lead to an under-estimation of effects. Second, the message portrayed within the Read the Play intervention regarding help-seeking emphasizes reaching out to a trusted friend or adult, such as a parent or sports coach, if experiencing mental health difficulties. Consistent with past research suggesting that adolescents are more likely to seek help from people they know and trust (Divin et al. 2018; Gulliver et al. 2010), these findings suggest that brief interventions like Read the Play are perhaps more effective in engaging young people to seek support from informal help-sources. Indeed, it was observed that informal help-seeking and sport-related help-seeking intentions significantly improved post-intervention for low scoring youth, and sport-related help-seeking intentions also improved for low scoring males and bottom age youth; representing a positive step to youth seeking support when needed.

As outlined above, and in conflict with hypothesis 3, the sample overall did not significantly improve in key constructs post-intervention. However, the high baseline level of each construct in the current sample may explain this lack of overall effect seen. Given this tendency for youth to score high on these constructs at baseline (ceiling effect), it is not surprising that an overall change in the sample post-intervention was not observed. Instead, the data demonstrates that Read the Play was particularly effective for those adolescents who are more likely to delay help-seeking (and, in turn, mental health treatment) due to a lack of mental health understanding and knowledge (Rickwood et al. 2007), therefore signifying that Read the Play was able to promote improvement in such constructs in potentially at-risk groups of young people.

Finally, help-seeking behaviors were examined to address the limitations of past research (Patafio et al. 2021). Contrary to the second hypothesis and past research suggesting that young people are more likely to seek help from people they know and trust (i.e., friends, parents) (Divin et al. 2018; Gulliver et al. 2010), there were no significant improvements in help-seeking behavior across an array of help-sources in the current study. The percentage of help-seeking behavior for most help-sources declined across the time points in the current study except for help-seeking behavior toward sport coaches (which saw a slight increase from baseline to immediate-post intervention) and partner and phone helpline sources (which saw slight improvements from baseline to follow-up), however these findings did not reflect significant proportional change. This lack of significant change is likely partly due to the short-term follow-up procedures employed. Specifically, follow-up testing was conducted 2–8 weeks post-intervention, which according to the Theory of Planned Behavior is perhaps not enough time to enact changes in all required behavior change components (McEachan et al. 2011). For example, short-term follow-up of 2–8 weeks may not allow adolescents time to adapt their beliefs regarding their peer's approval of the behavior and feel a sense of perceived control over engaging in the behavior (McEachan et al. 2011). Further, help-seeking behavior is also dependent on the lived experience of mental health problems, which by necessity becomes increasingly likely over more extended periods. Future studies should utilize longer follow-up periods with repeated measurements to examine this construct more validly. Notably, there was one unanticipated finding wherein adolescents reported having ever sought help from their parents/guardians at a lesser rate immediately post-intervention. One possible explanation for this may be that adolescents' understanding/knowledge of what constitutes a mental health problem has been improved by Read the Play, resulting in a lower (but more accurate) number of incidents being reported post-intervention.

The results from the present study should be considered in light of the study limitations. For example, while the current study incorporated a control condition to compare immediate intervention effects, ethical concerns related to withholding intervention meant that this could not be continued through to the final time point. The use of comparison clubs outside the sampling region (who had not previously received Read the Play) was considered to allow for comparisons at follow-up. However, it was decided that such demographic differences between clubs within and outside of the sampling region would result in invalid comparisons. Future research should evaluate similar interventions within a population that has not previously experienced the intervention to allow for the ethical incorporation of a non-treatment comparison throughout all evaluation time points.

A second limitation is not distinguishing between two critical elements of intervention; the brief psychoeducational

session and the placement of Player Wellbeing Officers. Due to follow-up testing occurring within a short time after Read the Play (2–8 weeks), any effects seen at follow-up were likely due to the education session; however, future research should examine the unique effectiveness of Player Wellbeing Officers on key outcomes.

Third, the short follow-up period (2–8 weeks) utilized in the current study was unlikely to be long enough to capture help-seeking behaviors. While follow-up testing was important in determining whether immediate intervention effects were maintained, this period was not enough to validly comment on behavior change. Short term follow-up was employed due to the reality of sporting seasons and lack of access/engagement outside the sporting season, however, future studies may extend follow-up testing into the following sporting season if they can overcome the potential problem of player list change and tracking. Further, it would be beneficial to measure mental health symptomology within future studies to determine the need for help-seeking behavior, as this will allow for a more accurate overview of the effectiveness of the intervention in question for those youth currently experiencing mental health problems.

Fourth, while participants were divided into bottom-age and top-age players to account for potential biases associated with some youth (i.e., top-age players) receiving the intervention in the previous year, it should be noted that it is possible that a small number of top-age players may have not received the intervention before (i.e., perhaps they missed the session held in the previous year, or are new to football/netball and therefore were not a part of a club to have received the intervention in the previous year). This potential group of top-age players receiving the intervention for the first time are therefore likely to be impacted by the Read the Play intervention differently than those who received a similar program in the previous year. However, the inclusion of additional subgroup analyses (particularly those examining players who rated poorly on key constructs) allows for examination of any such differences. Further, the impact of pre-exposure to the Read the Play program to this potential subset of top-age players receiving the intervention for the first time would at-best reduce the effect size of the current intervention. However, future research may wish to explicitly examine this potential confound.

Finally, the ethics committee required that items concerning mental illness stigma within the mental health literacy scale be modified to positively-framed statements only. It is noted that there are advantages, including correcting for acquiescence/agreement bias, and disadvantages, such as lower reliability, to incorporating reversed and negated items in a scale (Weijters and Baumgartner 2012), therefore it is unclear what impact the current scale modification has had on the overall findings. While the current findings appear psychometrically sound and consistent with theory, they are not directly comparable to past research using the mental health literacy scale (e.g., Gorczynski et al. 2017; Recto and Champion 2017) due to this modification, and thus should be interpreted with care.

Conclusion

Interventions aimed at improving youth mental health literacy and help-seeking behaviors/intentions are important as they assist in the normalization of mental health problems and knowing where to get help. These interventions are common in schooling environments, however amateur sporting environments represent an opportunity to reach youth in a different way, as well as those youth not as engaged in school-based contexts. Sporting clubs represent a setting where young people choose to gather with their peers, and where they are able to feel a sense of belonging and purpose. The current study sought to fill this gap by examining a brief, psychoeducational mental health literacy intervention delivered within an amateur sporting environment, whereby it was found that Read the Play was effective in improving mental health literacy and help-seeking intentions for those youth who needed it most (i.e., those who have low baseline levels of mental health literacy and help-seeking intentions, and those who have not received the information outlined within the intervention before). Further, this intervention targeted both male and female sporting youth, rather than just male sporting youth, as has been done by past research in sporting environments (Liddle et al. 2019; Vella et al. 2021), and found that for the most part (8/10 significant findings) the intervention was helpful irrespective of youth gender, thus signifying the importance of also targeting female sporting youth in future programs. Importantly, such an intervention's efficacy may depend on the whole club buy-in and the presence of accessible supports, such as Player Wellbeing Officers. It is concluded that the understanding of mental health in adolescents most in need can be positively impacted through brief interventions delivered within their amateur sport.

Acknowledgements B.P. is supported by Deakin University Research Services through an Australian Government Research Training Program Scholarship.

Authors' Contributions B.P. conceived the study, participated in its design, collection, coordination, and interpretation, ran statistical analyses, and drafted the paper; D.S. participated in the design of the study, assisted in performing statistical analyses, and assisted in paper revisions; P.M. participated in the design and coordination of the

study, and assisted in paper revisions; S.H. conceived the study, participated in its design, collection, and interpretation, and helped to draft the paper. All authors read and approved the final paper.

Funding This project was partially funded by Kempe Read the Play. The funding source had no involvement in the study.

Data Sharing and Declaration This paper data will not be deposited.

Compliance with Ethical Standards

Conflict of Interest The authors declare no competing interests.

Ethical Approval This project was approved by the Deakin University Human Research Ethics Committee (2018-383).

Informed Consent Informed parental consent and youth assent were obtained for all participants in the study.

Publisher's note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Appendix A

Syntax for Power Simulations for Control Group Usage (run in R)

```
# Number of simulations
n_sim <- 1000
# Sample size of each group
samplesize <- c(272, 44)
# Mean of each group
meangroup <- c(10, 10.8)
# Standard deviation of each group (assumed to be equal!)
sdgroup <- c(1.65, 1.65)
p_vals <- NULL
# Set seed for reproducibility
set.seed(110788)
for(i in 1:n_sim)
{dat_tmp <- data.frame(y = rnorm(sum(samplesize), mean = rep(meangroup, times = samplesize), sd = rep(sdgroup, times = samplesize)), group = factor(rep(seq_along(meangroup), times = samplesize))
mod <- anova(lm(y~group, data = dat_tmp))
p_vals[i] <- mod$'Pr(>F)'[1]
rm(dat_tmp)}
# Simulated power
cat("Simulated power is:", (sum(p_vals <= 0.05)/n_sim) *100, "%")
```

Appendix B

Tables 9 and 10

Table 9 Summary of topics and activities for read the play session one

Topic	Key content and explanation
What is mental health?	- Players provide suggestions for what they believe mental health is - Facilitator defines mental health and mental illness, emphasizing that mental illness is often episodic and treatable
Myths and misconceptions	- True and false game about mental illness and drug and alcohol problems (each answer discussed as a group) - Example true/false questions include: "If you are depressed it just means you are going through a tough time" and "Using alcohol or other drugs can make mental health problems worse"
Mental health continuum	- Discussion about everyone moving back and forth on a continuum between good mental health and mental health problems - Seeking help can prevent the development of mental illness - Difference between mental health problems and mental illness discussed
What is a mental illness?	- Team game where players decide what is, and is not, a mental illness from a set of provided cards - Team game to discuss how many young Australians will experience a mental illness in any 1 year
Stigma	- Team game to unjumble puzzle pieces to reveal photos of famous people, then name their experienced mental health problem. Photos include Buddy Franklin (AFL footballer), Leornardo Di Caprio (Actor) and Miley Cyrus (Singer)
Problem recognition film	- Discussion about changes in one of the adolescent character's behavior, and how a friend noticing this change and offering support was vital to this person seeking help - Team game to think of as many signs and symptoms (physical, psychological, behavioral) of depression and anxiety as possible
Help-seeking	- Emphasize that seeking help early leads to better mental health outcomes - Discuss formal and informal help-seeking options - Emphasize the importance of looking out for your friends/teammates, and that asking "R U OK" will help, not harm
Self-care	- Team game where players think of ways to maintain or promote good mental wellbeing, followed by a group discussion on the importance of self-care, purpose, meaningful connection, physical activity and sense of control in maintaining mental wellbeing

Table 10 Summary of topics and activities for read the play session two

Topic	Key content and explanation
What is mental health?	- Players provide suggestions for what they believe mental health is - Facilitator defines mental health and mental illness, emphasizing that mental illness is often episodic and treatable - Team game to identify as many signs and symptoms of mental ill health in 30 s
Mental health continuum	- Discussion about everyone moving back and forth on a continuum between good mental health and mental health problems - Seeking help can prevent the development of mental illness - Difference between mental health problems and mental illness discussed
How common is suicide?	- Discussion of the statistics of suicides in Australia, suicide in young people, and the strong relationship between suicide and mental illness - Discussion about how to ask about suicide if you think someone is suicidal, and how asking does not harm people or "make them" feel suicidal
Help-seeking	- Team game (bingo) about ways to access support for mental health problems, followed by discussion of formal and informal help-seeking options - Team game to unjumble blocks to uncover messages which can be used to help support a friend experiencing mental health difficulties
Stress and mental health	- Team game (crossword puzzle) focusing on different stressors commonly experienced in adolescence, followed by a group discussion of how stress can be related to mental health problems
Self-care	- Team game where players list as many ideas as possible for how to maintain good mental health beginning with each letter of the alphabet, followed by a group discussion on the importance of self-care, purpose, meaningful connection, physical activity and sense of control in maintaining mental wellbeing

References

Aubert, S., Barnes, J. D., Abdeta, C., Nader, P. A., Adeniyi, A. F., Aguilar-Farias, N., Tenesaca, D. S. A., Bhawra, J., Brazo-Sayavera, J., Cardon, G., Chang, C.-K., Nyström, C. D., Demetriou, Y., Draper, C. E., Edwards, L., Emeljanovas, A., Gába, A., Galaviz, K. I., González, S. A., & Tremblay, M. (2018). Global matrix 3.0 physical activity report card grades for children and youth: results and analysis from 49 countries. *Journal of Physical Activity and Health*, *15*(S2), S251–S273. https://doi.org/10.1123/jpah.2018-0472.

Australian Bureau of Statistics. (2016). *Census of population and housing: Socio-economic indexes for areas (SEIFA), Australia, 2016*. https://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/2033.0.55.001Main+Features12016?OpenDocument.

Bauman, N. J. (2016). The stigma of mental health in athletes: are mental toughness and mental health seen as contradictory in elite sport? *British Journal of Sports Medicine*, *50*(3), 135–136. https://doi.org/10.1136/bjsports-2015-095570.

Breslin, G., Haughey, T. J., Donnelly, P., Kearney, C., & Prentice, G. (2017). Promoting mental health awareness in sport clubs. *Journal of Public Mental Health*, *16*(2), 55–62. https://doi.org/10.1108/JPMH-08-2016-0040.

Breslin, G., Shannon, S., Haughey, T., Donnelly, P., & Leavey, G. (2017). A systematic review of interventions to increase awareness of mental health and well-being in athletes, coaches and officials. *Systematic Reviews*, *6*, 1–15. https://doi.org/10.1186/s13643-017-0568-6.

Danish, S. J., Taylor, T. E., & Fazio, R. J. (2003). Enhancing adolescent development through sports and leisure. In G. R. Adams & M. Berzonsky (Eds.), *Blackwell Handbook on Adolescence* (pp. 92–108). Malden, MA: Blackwell.

Deane, F., & Wilson, C. (2007). *Considerations for specifying problem-types, help-sources and scoring the General Help-seeking Questionnaire (GHSQ)*. http://www.uow.edu.au/content/groups/public/@web/@health/@iimh/documents/doc/uow039041.pdf.

DeCoster, J., Gallucci, M., & Iselinm, A. M. R. (2011). Best practices for using median splits, artificial categorization, and their continuous alternatives. *Journal of Experimental Psychopathology, 2*(2), 197–209. https://doi.org/10.5127/jep.008310.

DeCoster, J., Iselin, A. M. R., & Gallucci, M. (2009). A conceptual and empirical examination of justifications for dichotomization. *Psychological Methods*, *14*(4), 349–366. https://doi.org/10.1037/a0016956.

Divin, N., Harper, P., Curran, E., Corry, D., & Leavey, G. (2018). Help-seeking measures and their use in adolescents: a systematic review. *Adolescent Research Review*, *3*(1), 113–122. https://doi.org/10.1007/s40894-017-0078-8.

Doherty, S., Hannigan, B., & Campbell, M. J. (2016). The experience of depression during the careers of elite male athletes. *Frontiers in Psychology*, *7*, 1–11. https://doi.org/10.3389/fpsyg.2016.01069.

Eime, R. M., Young, J. A., Harvey, J. T., Charity, M. J., & Payne, W. R. (2013). A systematic review of the psychological and social benefits of participation in sport for children and adolescents: informing development of a conceptual model of health through sport. *International Journal of Behavioral Nutrition and Physical Activity*, *10*, 1–21. https://doi.org/10.1186/1479-5868-10-98.

Field, A. (2013i). *Discovering statistics using IBM SPSS statistics* (*4th ed.*). Sage Publications, London.

Ferguson, C. J. (2016). An effect size primer: a guide for clinicians and researchers. *Professional Psychology: Research and Practice*, *40*(5), 532–538. https://doi.org/10.1037/14805-020.

Garson, G. D. (2015). *Missing Values Analysis and Data Imputation*. Statistical Associates Publishers.

Gore, F. M., Bloem, P. J., Patton, G. C., Ferguson, J., Joseph, V., Coffey, C., Sawyer, S. M., & Mathers, C. D. (2011). Global burden of disease in young people aged 10–24 years: a systematic analysis. *The Lancet*, *377*(9783), 2093–2102. https://doi.org/10.1016/S0140-6736(11)60512-6.

Green, B. C., & Jones, I. (2005). Serious leisure, social identity and sport tourism. *Sport in Society*, *8*(2), 164–181. https://doi.org/10.1080/174304305001102010.

Gorczynski, P., Sims-Schouten, W., Hill, D., & Wilson, J. C. (2017). Examining mental health literacy, help seeking behaviours, and mental health outcomes in UK university students. *The Journal of*

Mental Health Training, Education and Practice, *12*(2), 111–120. https://doi.org/10.1108/JMHTEP-05-2016-0027.

Gulliver, A., Griffiths, K. M., & Christensen, H. (2010). Perceived barriers and facilitators to mental health help-seeking in young people: a systematic review. *BMC Psychiatry*, *10*(1), 1–9. https://doi.org/10.1186/1471-244X-10-113.

Gulliver, A., Griffiths, K. M., & Christensen, H. (2012). Barriers and facilitators to mental health help-seeking for young elite athletes: a qualitative study. *BMC Psychiatry*, *12*, 1–14. https://doi.org/10.1186/1471-244X-12-157.

Hurley, D., Allen, M. S., Swann, C., Okely, A. D., & Vella, S. A. (2018). The development, pilot, and process evaluation of a parent mental health literacy intervention through community sports clubs. *Journal of Child and Family Studies*, *27*(7), 2149–2160. https://doi.org/10.1007/s10826-018-1071-y.

Hurley, D., Swann, C., Allen, M. S., Okely, A. D., & Vella, S. A. (2017). The role of community sports clubs in adolescent mental health: The perspectives of adolescent males' parents. *Qualitative Research in Sport, Exercise and Health*, *9*(3), 372–388. https://doi.org/10.1080/2159676X.2016.1275751.

Hutchins, S. S., Brown, C., Mayberry, R., & Sollecito, W. (2015). Value of a small control group for estimating intervention effectiveness: results from simulations of immunisation effectiveness studies. *Journal of Comparative Effectiveness Research*, *4*(3), 227–238. https://doi.org/10.2217/cer.15.11.

Iacobucci, D., Posavac, S. S., Kardes, F. R., Schneider, M. J., & Popovich, D. L. (2015). Toward a more nuanced understanding of the statistical properties of a median split. *Journal of Consumer Psychology*, *25*(4), 652–665. https://doi.org/10.1016/j.jcps.2014.12.002.

Jakobsen, J. C., Gluud, C., Wetterslev, J., & Winkel, P. (2017). When and how should multiple imputation be used for handling missing data in randomised clinical trials–a practical guide with flowcharts. *BMC Medical Research Methodology*, *17*(1), 1–10. https://doi.org/10.1186/s12874-017-0442-1.

Jones, P. B. (2013). Adult mental health disorders and their age at onset. *The British Journal of Psychiatry*, *202*(s54), s5–s10. https://doi.org/10.1192/bjp.bp.112.119164.

Jorm, A. F. (2012). Mental health literacy: empowering the community to take action for better mental health. *American Psychologist*, *67*(3), 231–243. https://doi.org/10.1037/a0025957.

Jorm, A. F., Korten, A. E., Jacomb, P. A., Christensen, H., Rodgers, B., & Pollitt, P. (1997). "Mental health literacy": a survey of the public's ability to recognise mental disorders and their beliefs about the effectiveness of treatment. *Medical Journal of Australia*, *166*(4), 182–186. https://doi.org/10.5694/j.1326-5377.1997.tb140071.x.

Konstantopoulos, S. (2010). Power analysis in two-level unbalanced designs. *The Journal of Experimental Education*, *78*(3), 291–317. https://doi.org/10.1080/00220970903292876.

Lawrence, D., Johnson, S., Hafekost, J., Boterhoven de Haan, K., Sawyer, M., Ainley, J., & Zubrick, S. R. (2015). *The mental health of children and adolescents: Report on the second Australian child and adolescent survey of mental health and well-being*. Department of Health. https://www1.health.gov.au/internet/main/publishing.nsf/Content/mental-pubs-m-child2.

Leighton, S. (2010). Using a vignette-based questionnaire to explore adolescents' understanding of mental health issues. *Clinical Child Psychology and Psychiatry*, *15*(2), 231–250. https://doi.org/10.1177/1359104509340234.

Liddle, S. K., Deane, F. P., Batterham, M., & Vella, S. A. (2019). A brief sports-based mental health literacy program for male adolescents: a cluster-randomised controlled trial. *Journal of Applied Sport Psychology*, 1–25. https://doi.org/10.1080/10413200.2019.1653404.

Little, R. J. (1988). A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association*, *83*(404), 1198–1202. https://doi.org/10.1080/01621459.1988.10478722.

López, R. L., & Levy, J. J. (2013). Student athletes' perceived barriers to and preferences for seeking counseling. *Journal of College Counseling*, *16*(1), 19–31. https://doi.org/10.1002/j.2161-1882.2013.00024.x.

Lubans, D., Richards, J., Hillman, C., Faulkner, G., Beauchamp, M., Nilsson, M., Kelly, P., Smith, J., Raine, L., & Biddle, S. (2016). Physical activity for cognitive and mental health in youth: a systematic review of mechanisms. *Pediatrics*, *138*(3), e20161642 https://doi.org/10.1542/peds.2016-1642.

Martin, G., Swannell, S. V., Hazell, P. L., Harrison, J. E., & Taylor, A. W. (2010). Self-injury in Australia: a community survey. *Medical journal of Australia*, *193*(9), 506–510. https://doi.org/10.5694/j.1326-5377.2010.tb04033.x.

McEachan, R. R. C., Conner, M., Taylor, N. J., & Lawton, R. J. (2011). Prospective prediction of health-related behaviours with the theory of planned behaviour: a meta-analysis. *Health Psychology Review*, *5*(2), 97–144. https://doi.org/10.1080/17437199.2010.521684.

McGorry, P. D., Goldstone, S. D., Parker, A. G., Rickwood, D. J., & Hickie, I. B. (2014). Cultures for mental health care of young people: an Australian blueprint for reform. *The Lancet Psychiatry*, *1*(7), 559–568. https://doi.org/10.1016/S2215-0366(14)00082-0.

Musca, S. C., Kamiejski, R., Nugier, A., Méot, A., Er-Rafiy, A., & Brauer, M. (2011). Data with hierarchical structure: impact of intraclass correlation and sample size on type-I error. *Frontiers in Psychology*, *2*(74), 1–6. https://doi.org/10.3389/fpsyg.2011.00074.

O'Connor, M., & Casey, L. (2015). The Mental Health Literacy Scale (MHLS): a new scale-based measure of mental health literacy. *Psychiatry Research*, *229*(1–2), 511–516. https://doi.org/10.1016/j.psychres.2015.05.064.

Patafio, B., Miller, P., Baldwin, R., Taylor, N., & Hyder, S. (2021). A systematic mapping review of interventions to improve adolescent mental health literacy, attitudes and behaviours. *Early Intervention in Psychiatry*. Advance Online Publication. https://doi.org/10.1111/eip.13109.

Pierce, D., Liaw, S.-T., Dobell, J., & Anderson, R. (2010). Australian rural football club leaders as mental health advocates: An investigation of the impact of the Coach the Coach project. *International Journal of Mental Health Systems*, *4*, 1–8. https://doi.org/10.1186/1752-4458-4-10.

R Core Team. (2013). *R: A language and environment for statistical computing*. Vienna, Austria: R Foundation for Statistical Computing. https://www.r-project.org/.

Radez, J., Reardon, T., Creswell, C., Lawrence, P. J., Evdoka-Burton, G., & Waite, P. (2020). Why do children and adolescents (not) seek and access professional help for their mental health problems? A systematic review of quantitative and qualitative studies. *European Child & Adolescent Psychiatry*, 1–29. https://doi.org/10.1007/s00787-019-01469-4.

Recto, P., & Champion, J. D. (2017). Assessment of mental health literacy among perinatal Hispanic adolescents. *Issues in Mental Health Nursing*, *38*(12), 1030–1038. https://doi.org/10.1080/01612840.2017.1349224.

Rickwood, D. J., & Braithwaite, V. A. (1994). Social-psychological factors affecting help-seeking for emotional problems. *Social Science and Medicine*, *39*(4), 563–572. https://doi.org/10.1016/0277-9536(94)90099-X.

Rickwood, D. J., Deane, F. P., & Wilson, C. J. (2007). When and how do young people seek professional help for mental health

problems? *Medical Journal of Australia*, *187*(7), 35–39. https://doi.org/10.5694/j.1326-5377.2007.tb01334.x.

Ritchie, H., & Roser, M. (2018). Mental Health. *Our World in Data*. https://ourworldindata.org/mental-health.

Sebbens, J., Hassmén, P., Crisp, D., & Wensley, K. (2016). Mental health in sport (MHS): improving the early intervention knowledge and confidence of elite sport staff. *Frontiers in Psychology*, *7*(911), 1–9. https://doi.org/10.3389/fpsyg.2016.00911.

Solmi, M., Radua, J., Olivola, M., Croce, E., Soardo, L., de Pablo, G. S., Shin, J., Kirkbride, J. B., Jones, P., Kim, J. H., Kim, J. Y., Carvallho, A. F., Seeman, M. V., Correll, C. U., & Fusar-Poli, P. (2021). Age at onset of mental disorders worldwide: large-scale meta-analysis of 192 epidemiological studies. *Molecular Psychiatry*, 1–15. https://doi.org/10.1038/s41380-021-01161-7.

Stavseth, M. R., Clausen, T., & Røislien, J. (2019). How handling missing data may impact conclusions: a comparison of six different imputation methods for categorical questionnaire data. *SAGE Open Medicine*, *7*, 1–12. https://doi.org/10.1177/2050312118822912.

Street, G., James, R., & Cutt, H. (2007). The relationship between organised recreational and mental health. *Health Promotion Journal of Australia: Official Journal of Australian Association of Health Promotion Professionals*, *18*(3), 236–239. https://doi.org/10.3316/informit.451930752700538.

Vella, S. A., Swann, C., Batterham, M., Boydell, K. M., Eckermann, S., Ferguson, H., Fogarty, A., Hurley, D., Liddle, S. K., Lonsdale, C., Miller, A., Noetel, M., Okely, A. D., Sanders, T., Schweickle, M. J., Telenta, J., & Deane, F. P. (2021). An intervention for mental health literacy and resilience in organized sports. *Medicine and Science in Sports and Exercise*, *53*(1), 139–149. https://doi.org/10.1249/MSS.0000000000002433.

Von Elm, E., Altman, D. G., Egger, M., Pocock, S. J., Gøtzsche, P. C., & Vandenbroucke, J. P. (2007). The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *Annals of Internal Medicine*, *147*(8), 573–577. https://doi.org/10.7326/0003-4819-147-8-200710160-00010.

Weijters, B., & Baumgartner, H. (2012). Misresponse to reversed and negated items in surveys: a review. *Journal of Marketing Research*, *49*(5), 737–747. https://doi.org/10.1509/jmr.11.0368.

Wilson, C. J., Deane, F. P., Ciarrochi, J. V., & Rickwood, D. (2005). Measuring help seeking intentions: properties of the general help seeking questionnaire. *Canadian Journal of Counselling*, *39*(1), 15–28. https://ro.uow.edu.au/hbspapers/1527/.

Wilson, D. B. (n.d.). *Practical Meta-Analysis Effect Size Calculator [Online calculator]*. Campbell Collaboration. https://campbellcollaboration.org/research-resources/effect-size-calculator.html.

World Health Organization. (2020, September 28). *Adolescent mental health*. https://www.who.int/news-room/fact-sheets/detail/adolescent-mental-health

Brittany Patafio is a PhD candidate at Deakin University, Australia. Her major research interests include mental health literacy and help-seeking in youth, community safety, and violence typologies.

David Skvarc is a Lecturer at Deakin University, Australia. His major research interests include cognitive change, predictors of longitudinal function, and remote data capture methodologies.

Peter Miller is a Professor of Violence Prevention and Addiction Studies at Deakin University, Australia. His major research interests include alcohol and drug-related violence, predictors of violence (including family and domestic violence), community safety, and Corporate Political Activity of alcohol and dangerous consumptions industries.

Shannon Hyder is a Lecturer at Deakin University, Australia. His major research interests include violence typologies and their intersection with mental health, and community safety.