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Title:
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Date:
2024

Citation:
Lu, S., Hart, L. M., Jorm, A. F., Gregg, K. & Morgan, A. J. (2024). Associations of Adolescent Mental Health First Aid Intentions and Help-Giving Behaviours: A School-Based Longitudinal Study. School Mental Health, 16 (1), https://doi.org/10.1007/s12310-023-09625-7.

Persistent Link:
https://hdl.handle.net/11343/340339

# Associations of adolescent mental health first aid intentions and help-giving behaviours: a school-based longitudinal study

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## Abstract

It is unclear how well intentions to support an adolescent peer with a mental health problem or in crisis translate into actual help-giving behaviours. Using data from a longitudinal study, this analysis aimed to investigate the associations between mental health first aid intentions and supportive behaviours among adolescents. A sample of 2749 Australian adolescents were included in the baseline analyses of 12 intention items and other covariates. At 12- and 18-month follow-up, 733 and 520 students reported valid data on their help-giving behaviours. Linear and logistic regression models were employed to examine the associations. High to moderate concordance was observed between baseline first aid intentions and the corresponding helping behaviours during follow-up assessments, with exceptions in items related to seeking help from adults/professionals or suicide. The overall quality of first aid intentions at baseline were significantly associated with that of helping behaviours at 12-month follow-up, after adjusting for potential confounders. Eleven of the 12 measured intentions prospectively predicted corresponding actions at 12-months, and in 7 of them such predictive effect remained significant up to 18 months after training delivery. These findings suggest that adolescents' first aid intentions can predict their helping behaviours, thus supporting the notion that training programs that improve adolescents' first aid intentions have the potential to translate into actual actions. Future research is warranted to narrow the gap between certain intentions and behaviours, particularly those related to seeking help from adults/professionals and suicide.

**Keywords** Intentions, Supportive behaviours, Adolescents, Suicide, Mental disorder, Mental Health First Aid (MHFA)

## Introduction

Adolescence, a developmental phase between childhood and adulthood, is a time of increased vulnerability to mental health problems (Blakemore, 2019). Such vulnerability is compounded by the fact that nearly half of all mental disorders manifest before the age of 18, with peak onset occurring at around 14 years of age (Solmi et al., 2022). Mental health problems in adolescence can lead to long-term morbidity in individuals and create a substantial burden for families, communities and society (Colman et al., 2007; Johnson et al., 2018). However, compared to other age groups, adolescents generally have the lowest engagement with treatment services (Geulayov et al., 2022; Merikangas et al., 2011).

Adolescents have a strong preference for seeking initial help from their friends when experiencing a mental health problem or crisis (Jorm & Wright, 2007; Rickwood et al., 2007; Stuckey et al., 2021), and decisions to seek professional help, to engage in and adhere to appropriate treatments, are heavily influenced by the attitudes and suggestions of their social network or peer group (Ridout & Campbell, 2018). Adolescents' knowledge of how to support a peer with a mental illness to seek appropriate help is, therefore, a potential avenue in increasing early intervention and reducing untreated mental illness in adolescents. However, many adolescents have poor mental health literacy, stigmatising attitudes towards people with mental illness, and lack the knowledge and skills required to provide support and prompt appropriate help-seeking (Subasinghe et al., 2023).

The teen Mental Health First Aid (tMHFA) course was developed by Hart et al. in 2012 to improve the supportive behaviours that adolescents provide to their peers to facilitate appropriate help seeking for mental health problems (Hart et al., 2016). The tMHFA program teaches adolescent mental health first aid, defined as '*the help an adolescent can give to a friend with a mental health problem, or a friend in a mental health crisis, until a reliable and trusted adult can take over*' (Hart et al., 2012; Hart et al., 2016). This acknowledges the limited developmental maturity and capacity of adolescents in coping with complex issues such as a mental illness in their peers (Ross et al., 2012), as well as repeated research evidence on the essential role of adults in supporting adolescents with mental health problems (Breslin et al., 2022; Gonsalves et al., 2023).

The core teaching of tMHFA is a five-point Action Plan, based on key messages developed through a Delphi expert consensus study (Ross et al., 2012), which includes: 1. Look for

warning signs; 2. Ask how they are; 3. Listen up; 4. Help them connect with an adult; and 5. Your friendship is important (shorten as 'Look, Ask, Listen, Help, Your friend'). The tMHFA training program has been licensed in 17 different countries and regions and there is evidence that it is effective in improving the quality of mental health first aid intentions towards peers with depression and suicide risk, or peers with anxiety, as well as in increasing mental health literacy and reducing stigma among adolescents (Hart et al., 2020; Hart et al., 2022; Hart et al., 2018).

Research on tMHFA and other MHFA programs to understand whether the training improves the support trainees offer to others has a noted research gap in the evidence that MHFA training leads to changes in behaviour and ultimately better outcomes for recipients of the first aid (Forthal et al., 2022; Mei & McGorry, 2020; Morgan et al., 2018). However, such behavioural data is incredibly difficult to obtain, given many trainees may not use the skills immediately, and access to recipients of aid is difficult as they may not have been the target of the MHFA training intervention. To observe behavioural effects, study designs need very large sample sizes, as well as a long follow-up period, to allow adequate time for support to occur and any impacts of that aid to be observed (Morgan et al., 2018). All of these requirements, however, can be challenging to adequately resource in the research environment. Thus, mental health first aid intentions, which are the planned actions a respondent would take to help a hypothetical person with a mental health problem in a vignette, have been used as a proxy for the actual help-giving behaviours in evaluations of MHFA programs (Bond et al., 2022; Hart et al., 2020; Morgan et al., 2020; Reavley et al., 2021).

Intentions—generally defined as conscious decisions and motivations in the enactment of health related behaviours (Webb & Sheeran, 2006)—are proximal antecedents to behaviours in many influential behavioural theories (Ajzen, 1991; Bandura, 1998; Plotnikoff & Trinh, 2010). As per the theory of planned behaviour (Ajzen, 1991), intentions to perform a given behaviour (e.g., adolescents' intentions to provide support to a peer experiencing a mental health problem or crisis) signal the deliberation about what one will do and indicates how hard one is prepared to try, should the scenario arise (e.g., the types of supportive actions a teenager actually takes when a friend shows symptoms of a mental health problem). Meta-analysis of empirical research on intention–behaviour relations showed that a medium-to-large change in intention engenders a small-to-medium change in behaviour (Webb & Sheeran, 2006).

Whilst many behavioural theories as mentioned above are typically for physical activities that are self-targeted (e.g., quitting tobacco use or exercising more), mental health first aid behaviours are 'other-targeted', or planned to occur towards another person experiencing a mental health problem or crisis (Kitchener et al., 2017). Thus, the enactment of such behaviours can be influenced by not only one's own intentions but also by other factors, such as the relationship between first aider and recipient, and the perceived mental health problem (Morgan & Rossetto, 2022; Rossetto et al., 2014). It is therefore not uncommon to observe that, while some people who have strong intentions to achieve a goal do succeed, others fail, producing discordance between intentions and behaviours. Understanding the 'intention–behaviour gap' has long been an important topic in the behavioural research domain (Rhodes & de Bruijn, 2013; Rhodes & Dickau, 2012). To draw inferences on whether improving first aid intentions through MHFA training translates into increased help-giving behaviours, it is essential to further investigate the relationship between mental health first aid intentions and behaviours.

A small number of previous studies have explored the associations between mental health first aid intentions and actual help-giving behaviours among adults (Rossetto et al., 2016; Usmani et al., 2023) and young people (Mason et al., 2015; Yap & Jorm, 2012), using a scoring protocol based on the standard adult MHFA Action Plan - 'ALGEE', which includes five action components of 'Approach and assess', 'Listen', 'Give support', 'Encourage professional help', and 'Encourage other supports' (Kitchener et al., 2017). These studies consistently report positive associations between mental health first aid intentions and behaviours, but the magnitude of associations between specific intention and behaviour items (e.g., 'Approach and assess', 'Listen', 'Encourage professional help') can vary widely, ranging from strong to negligible. Research has also shown that intentions to assist a person at risk of suicide are associated with supporting actions (Jorm et al., 2019; Jorm et al., 2018). However, the tMHFA program uses a different 'Look, Ask, Listen, Help, Your friend' Action Plan that is specifically designed for adolescents based on expert consensus (Hart et al., 2016; Ross et al., 2012), so that the intentions measured in tMHFA are very different from 'ALGEE' used in the MHFA programs for adults. So far, only one previous study has examined the intention-behaviour relationship using the tMHFA Action Plan, but these data were very limited in their use of open-ended responses which adolescents typically provided poor quality responses to (Mason et al., 2015).

Therefore, using data from a larger, longitudinal study using structured response scales, the present research aimed to investigate how well adolescents' mental health first aid intentions prospectively predict their actual help-giving behaviours towards peers with mental health problems or in crisis. We hypothesised that the quality of mental health first aid intentions among adolescents at baseline would predict the quality of help-giving behaviours at 12- and 18-month follow-up. We also hypothesised that each of the adolescent mental health first aid intentions would predict their corresponding helping actions at follow-up.

## Methods

### Participants and recruitment

Participants were adolescents in a cluster randomised controlled trial that involved ten senior secondary schools across the State of Victoria, Australia, during 2017 - 2021 (trial register ID: ACTRN12617000633381). Schools were randomised to either the intervention group (tMHFA training) or to a control group (Physical First Aid training). Once a school had agreed to host the trial, all students at the Year 10 level were eligible to participate, unless a parent/guardian opted them out (i.e., passive parental consent was used), or the student themselves did not provide their online assent for participation. Online surveys were conducted at four time points: prior to the delivery of training, post-training (approximately 4-week interval), 12- and 18-months after the training. Ethics approval for this trial was obtained from the Human Research Ethics Committee at the University of Melbourne (approval ID 1341238.4) and Victorian Department of Education (approval ID 2014_002268).

Considering the potential influence of training on participants' intentions, we used the post-training data as the baseline for this analysis to predict the occurrence and quality of help-giving behaviours at follow-ups. The tMHFA program teaches specific skills rather than just the importance of offering general help. Thus, the primary focus of this study was to assess the correspondence between each intended action (and their total) and the behaviour provided, rather than examining whether the intention to help is associated with providing any form of assistance.

Furthermore, our data show that the vast majority of adolescent participants offered assistance when they encountered a peer experiencing a mental health problem or crisis. Of the 1405 students who participated in the 12-month follow-up surveys, 773 reported encountering at least one peer with a mental health problem or crisis within the last 12 months. Among these,

733 individuals (95%) provided assistance to their peers. At the 18-month follow-up, among the 540 individuals who encountered peers with mental health problems, 520 (96%) offered help. Therefore, participants were eligible for inclusion in the follow-up analyses if they self-reported that they had met at least one peer who they thought might have a mental health problem or had experienced a mental health crisis during the 12- and/or 18-month follow-up period, AND, they offered any kind of help to that peer.

## Measures

### Adolescent mental health first aid intentions

The 12-item Mental Health Support Scale for Adolescents (MHSSA), as assessed by Lu et al. (Lu et al., 2023), is a criterion-referenced instrument demonstrating established convergent validity, internal consistency, and satisfactory test-retest reliability. This scale was used across survey time points to measure the quality of adolescents' intentions to provide help towards a hypothetical young person in a vignette. Two vignettes were presented: one (John) depicting an adolescent with suicidal ideation and symptoms matching criteria for a depressive disorder according to the *Diagnostic and Statistical Manual of Mental Disorders–5$^{th}$ Edition* (DSM-5) and *International Statistical Classification of Diseases and Related Health Problems–10$^{th}$ Revision* (ICD-10), and the other (Jeanie) with symptoms matching criteria for social anxiety/phobia. The MHSSA asks *'If [John/Jeanie] were a friend I would…'* and then presents a 5-point Likert response scale (from '1 - *Never do this*' to '5 - *Definitely do this*') for each of the 12 intention items, describing helpful (n = 6) and unhelpful or potentially harmful (n = 6) strategies for responding to the character in the vignette. The details of the two vignettes and a complete copy of the MHSSA can be seen in Supplement 1.1.

The helpful intention items of MHSSA (as marked in Supplement 1.1) were scored as '1' if the response was 'Probably do this' or 'Definitely do this'; otherwise, they were scored as '0'. Differently, harmful intention items were reverse scored, i.e., scored as '1' if the response was 'Never do this' or 'Unlikely to do this', and scored as '0' with any other responses. Thus, higher scores indicate a better quality of mental health first aid intentions.

Given that MHSSA was designed to be applied across mental health problems among adolescents, the average of intention scores across the two vignettes was used as the predictor of help-giving behaviours in this analysis. Based on the established constructs of the MHSSA (Lu et al., 2023), three intention scores were calculated, which are: 1) the quality score of

helpful intentions, which is the average of the sum score of the six helpful items across vignettes, ranging 0-6; 2) the quality score of avoidance of harmful intentions, which is the average of the sum score of the six harmful items across vignettes, also ranging 0-6; and 3) the total intention score, which refers to the average of the total score on both helpful and avoidance of harmful items across vignettes, ranging 0-12.

### Adolescent supportive behaviours

At 12-months and 18-months follow-up, students were asked if they had met at least one peer '*who they thought might have a mental health problem or has experienced a mental health crisis*' in the period of time since the last survey. If students responded 'Yes', they were then asked about the number of such peers they met and if they had offered any help. If they had met more than one such peer, they were asked to answer question about 'the person who you know best'. Students were then asked '*What did you do to help the person?*'. To respond to this question, they were shown twelve helping actions and asked to respond 'Yes' - if the action was taken, or 'No' - if not. The 12 actions corresponded to the 12 items of the MHSSA, but were expressed as behaviours rather than intentions. Further details of survey questions relating to helping actions at follow-ups are presented in Supplement 1.2.

Action items were scored as '1' if a helpful action was taken, OR, if a harmful action was not taken; otherwise, they were scored as '0'. Similar to the scoring of intentions, three action scores for helpful (ranging 0-6), avoidance of harmful (ranging 0-6), and the total of helpful and avoidance of harmful (ranging 0-12) were calculated, respectively.

Previous studies reveal that some factors may influence the associations between first aid intentions and behaviours, such as mental health literacy, confidence in providing help, and stigmatising attitudes towards people with a mental health problem (Rossetto et al., 2016; Usmani et al., 2023; Yap & Jorm, 2012). Thus, these factors were included in this study as covariates, measured as described below.

### Recognition of the mental health problem in the vignette

Following the description of the vignette as described in the MHSSA, participants were asked '*What, if anything, is wrong with John/Jeanie* (i.e., the person in the vignette)*?*'. Text responses to this open-ended question were coded verbatim in accordance with a structured protocol (Mason et al., 2015). To be considered as correct recognition of the mental health problem in the vignette, responses needed to mention either 'depression/depressed' or 'suicide/suicidal

thoughts' to the depression/suicide (John) vignette; and any one of 'social anxiety', 'social phobia', 'anxiety/anxious' or 'anxiety disorder' to the social anxiety/phobia (Jeanie) vignette.

### Confidence in providing help

Confidence in providing help to a person with a mental health problem or in crisis was assessed by the question '*If John/Jeanie was a friend, how confident would you feel helping him/her?*' with 5 responses from 1 = '*Not at all confident*' to 5 = '*Extremely confident*'.

### Social distance

The desired social distance (i.e., desired proximity between self and others in social contexts) (Bogardus, 1925) from a peer experiencing a mental illness was measured by an adapted version of the Social Distance Scale (Jorm & Wright, 2008; Yap et al., 2014). This scale includes 5 items (e.g., '*Would you be happy to develop a close friendship with John/Jeanie?'*) with a 4-point Likert scale, score ranging 1 ('*Yes definitely'*) – 4 ('*Definitely not'*). Higher scale scores indicate greater social distance, and therefore stronger stigmatising attitudes.

The measure has shown excellent reliability with $\alpha = 0.88$ in community surveys of youth (Yap et al., 2014). In a sample of 3094 students from Australian senior secondary schools, the McDonald's omega of the scale was 0.95 for the John vignette and 0.96 for the Jeanie vignette (Lu et al., 2023). The validity of this scale is also supported by evidence that people with lower scores on social distance have more contact with people with mental illness (Jorm & Oh, 2009). The full items of the Scale of Social Distance are presented in Supplement 2.

### Personal stigma

The Depression Stigma Scale developed by Griffiths et al. (Griffiths et al., 2004) was modified by Hart et al. for use to measure the levels of personal stigma towards John/Jeanie vignette in tMHFA (Hart et al., 2018) (scale can be seen in Supplement 3). This scale consists of three distinct dimensions of 'Weak-not-sick' (i.e., viewing mental illness as a sign of personal weakness, rather than a medical illness, with 4 items included), 'Dangerous/unpredictable' (i.e., seeing people with mental illness as dangerous or unpredictable, with 3 items included) and 'Would-not-tell-anyone' (i.e., would not tell anyone if they themselves had a mental health problem, with 1 item included) (Yap et al., 2014). Each dimension is scored as the average of its items and have high levels of internal consistency in adolescents (Lu et al., 2023).

## Data collection procedure

The parent/guardian of students were informed of the study and their passive consent were sought and obtained for students' participation. Eligible students with parental consent were provided an electronic link to the online survey hosted by the SurveyMonkey platform (www.surveymonkey.com/mp/australia/), where they read a description of the research in plain language and provided electronic assent to participate.

Students completed the measures as described above during regular class time and were supervised by teaching and research staff. Basic demographic information (i.e., age, gender, language spoken at home) was also collected in the pre-training survey during the trial. Students took around 20-30 minutes to complete the survey and were provided with an AU$5 voucher as a gratuity for their attendance at a survey session (Lu et al., 2023).

There were 2749 participants included in the baseline analysis for this study, 733 for the 12-month follow-up and 520 for the 18-month follow-up. Due to COVID-19 related restrictions on conducting research in schools in the State of Victoria, Australia, since March of 2020, only 2 schools were able to complete both the 12- and 18-month follow-ups whilst the remaining 8 schools were included in either the 12-month follow-up or the 18-month follow-up.

## Statistical analysis

The baseline intention scores between the two groups of schools attending and missing at the 12- and 18-month follow-up surveys were compared, and no statistically significant differences were observed (data not shown). The missing values in cases where 1-2 items missing on the MHSSA scale were imputed using the mean score of the available responses. Participants who did not provide any response on the MHSSA scale for a specific vignette were excluded from the analysis pertaining to that particular vignette. It is worth noting that these were the only two instances of missing MHSSA data observed in the trial.

Regarding the statistical methods, we initially examined the endorsement rate of first aid intentions (i.e., responding *'Probably do this'* or *'Definitely do this'* to an intention item) across vignettes at the individual item level at baseline and the prevalence rate of helping actions (i.e., responding '*Yes*' to an action item) at 12- and 18-month follow-up. Next, linear regression models were used to test the associations of help-giving behaviours and intentions and covariates, by the helpful/harmful dimension. Potential confounders including gender, language spoken at home, recognition of the mental health problem in vignettes, personal

stigma, social distance, and confidence in providing help were adjusted in the multivariate linear regression models.

Lastly, binary logistic regression analyses with individual intention as the independent variable and matched action as the dependant variable were conducted to test the associations between intentions and actions at the item level, with odds ratios (ORs), 95% confidence intervals (CIs) and *p*-values being reported.

All analyses were conducted using Stata (version 17.0, College Station, Texas: StataCorp LLC), with a two-sided $p < 0.05$ considered as statistically significant.

## Results

### Description of study samples and analysed variables

The demographic characteristics of study samples, as well as the descriptive statistics of analysed variables, are presented in Table 1. The sample for baseline analysis was 15.90 years old on average (SD: 0.79 years), with 48.71% as female and 85.82% speaking English at home. The two follow-up samples were similar in age at baseline, but with higher percentages of females and students speaking English at home. Compared to those in the baseline sample, students at follow-up were more likely to be able to correctly recognise the mental health problem in vignettes, to have lower scores of personal stigma and social distance, but were similar in confidence to provide help.

Across vignettes, the quality score at baseline was 4.52 (±1.53) for helpful intentions and 3.72 (±1.45) for avoidance of harmful intentions. The baseline intentions scores were higher towards John in the depression/suicide vignette than towards Jeanie in the anxiety vignette. When it comes to the quality score of help-giving behaviours, it was 3.67 (±1.62) for helpful actions and 5.41 (±0.81) for avoidance of harmful actions at 12-month follow-up, and 3.78 (±1.53) and 5.39 (±0.86), respectively, at 18-month follow-up.

**Table 1.** Characteristics of study samples and descriptive statistics of analysed variables

| | Baseline (N=2749) | 12-month follow-up (N=733[a]) | 18-month follow-up (N=520[a]) |
|---|---|---|---|
| Age at baseline (years, Mean±SD) | 15.90±0.79 | 15.88±0.39 | 15.87±0.38 |
| Female (%) | 48.71 | 61.66 | 56.54 |
| Speaking English at home (%) | 85.82 | 91.99 | 88.00 |
| Correct recognition of the mental health problem across vignettes (%) | 72.05 | 86.90 | 85.96 |
| *Personal stigma (range 1-5, Mean±SD)* | | | |
| Weak-not-sick | 1.95±0.81 | 1.57±0.65 | 1.45±0.54 |
| Dangerous/unpredictable | 2.13±0.77 | 1.86±0.66 | 1.76±0.63 |
| Would-not-tell-anyone | 2.50±1.02 | 2.49±1.02 | 2.46±1.06 |
| Social distance (range 1-4, Mean±SD) | 1.78±0.62 | 1.62±0.54 | 1.52±0.52 |
| Confidence in providing help (range 1-5, Mean±SD) | 3.75±0.87 | 3.82±0.82 | 3.69±0.86 |
| *Quality score of intentions (range 0-6, Mean±SD)* | | | |
| Across vignettes | | | |
| Helpful intentions | 4.52±1.53 | | |
| Avoidance of harmful intentions | 3.72±1.45 | | |
| Towards John in the depression/suicide vignette | | | |
| Helpful intentions | 4.72±1.58 | | |
| Avoidance of harmful intentions | 3.75±1.48 | | |
| Towards Jeanie in the anxiety vignette | | | |
| Helpful intentions | 4.33±1.78 | | |
| Avoidance of harmful intentions | 3.69±1.68 | | |
| *Quality score of help-giving behaviours (range 0-6, Mean±SD)* | | | |
| Helpful actions | | 3.67±1.62 | 3.78±1.53 |
| Avoidance of harmful actions | | 5.41±0.81 | 5.39±0.86 |

[a] Participants who offered any help to a peer experiencing a mental health problem/crisis during relevant follow-up period.

## Comparison of the endorsement rate of intention items with the prevalence rate of action items

The endorsement rate of each intention item at baseline and the prevalence rate of each action item at follow-ups are shown in Fig. 1. Amongst the twelve measured intention-behaviour pairs, five were highly consistent (difference between the endorsement rate of intention and the prevalence rate of action < ±10%). For example, at least 80% of participants who endorsed the intention of 'Listen to the person' or 'Approach the person' took the same action at the 12- and 18-month follow-ups. By contrary, very few participants endorsed harmful intentions of 'Do nothing', 'Ignore the person', 'Unfriend the person' or 'Encourage to deal alone' at baseline, and even fewer participants took these actions at follow-ups.

A wide intention-behaviour gap (difference between the endorsement rate of intention and prevalence rate of action > ±25%) was observed in items 'Suggest telling an adult/professional' and 'Tell the person to fix their problem'. The intention-behaviour gap in the two suicide-related items was also large, about 20% for 'Ask about suicide' and 12% for 'Avoid talking about suicide', respectively. 'Ask about suicide' had the lowest intention endorsement rate (41%) amongst the six helpful intentions and the lowest prevalence rate of action (20% at both follow-up time points). 'Avoid talking about suicide', as a harmful item, had the second highest endorsement rate (37%) and the highest percentage of action taken at follow-up (about 25%).

## Linear regression results on the longitudinal associations between intentions and behaviours

### For helpful intentions and behaviours

Table 2 presents the results of univariate and multivariate linear regression analyses on predictors of helpful mental health first aid behaviours. Univariate analyses show that, across the 12- and 18-month follow-up, female gender and confidence in providing help were positively associated with the quality of helpful behaviours, whilst the 'Weak-not-sick' dimension of stigma and social distance were negatively associated. Speaking English language at home positively predicted the quality of helpful behaviours at 12-month follow-up, while the 'Dangerous/unpredictable' dimension of stigma negatively predicted. However, such effects were not observed at the 18-month follow-up. Age and the 'Would-not-tell-anyone' dimension of stigma were not associated with behaviours at either of the two follow-ups.

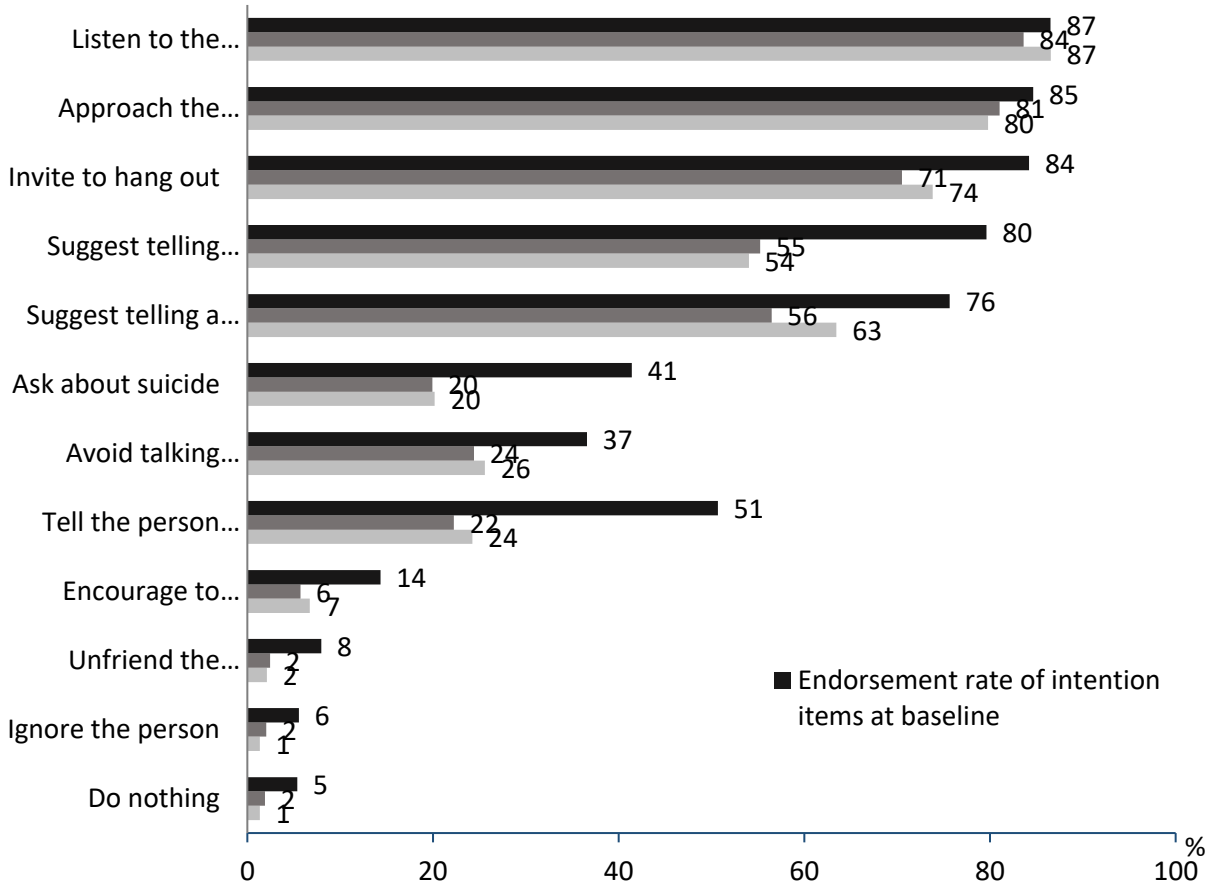


**Fig. 1** Endorsement rates of intention items at baseline and prevalence rates of action items at the 12- and 18-month follow-up

The estimated mean change in the quality score of helpful behaviours associated with an increase of 1 in the quality score of helpful intentions was 0.28 (95% CI: 0.19 – 0.38, $p < 0.001$) at 12-month follow-up, and 0.19 (95% CI: 0.08 – 0.29, $p < 0.01$) at 18-month follow-up. After adjusting for potential confounders, the association was attenuated but was still statistically significant at 12-month follow-up (adjusted B = 0.14, 95% CI: 0.02 – 0.25, $p < 0.05$), but not at 18-month follow-up (adjusted B = 0.27, 95% CI: -0.01 – 0.55).

### For avoidance of harmful intentions and behaviours

The predictors of avoiding harmful behaviours differed from those of helpful behaviours. As shown in Table 3, two dimensions of personal stigma - 'Weak-not-sick' and 'Dangerous/unpredictable' - both significantly predicted the quality of the avoidance of harmful behaviours across 12- and 18-month follow-up. Gender was only statistically significant at 12-months, and other covariates were significant at neither 12-month nor 18-month follow-up.

**Table 2.** Linear regression results on predictors of helpful mental health first aid behaviours among adolescents

| | 12mth follow-up (N=733) | | | 18mth follow-up (N=520) | | |
|---|---|---|---|---|---|---|
| | B | 95% CI | β | B | 95% CI | β |
| **Crude** | | | | | | |
| Age at baseline | -0.16 | -0.46 0.15 | -0.04 | -0.31 | -0.66 0.03 | -0.08 |
| Female[a] | 0.88*** | 0.64 1.11 | N/A | 0.64*** | 0.38 0.91 | N/A |
| Speaking English at home[b] | 0.54* | 0.09 0.99 | N/A | 0.42 | -0.01 0.84 | N/A |
| Correct recognition of the mental health problem in vignettes | 0.82*** | 0.42 1.21 | N/A | 0.75 | -0.22 1.71 | N/A |
| *Personal stigma* | | | | | | |
| Weak-not-sick | -0.54*** | -0.72 -0.37 | -0.24 | -0.21* | -0.40 -0.03 | -0.11 |
| Dangerous/unpredictable | -0.38*** | -0.57 -0.20 | -0.16 | -0.12 | -0.31 0.08 | -0.06 |
| Would-not-tell-anyone | -0.11 | -0.24 0.01 | N/A | 0.10 | -0.04 0.23 | N/A |
| Social distance | -0.55*** | -0.75 -0.35 | -0.21 | -0.37** | -0.60 -0.13 | -0.14 |
| Confidence in providing help | 0.31*** | 0.16 0.46 | 0.17 | 0.21* | 0.05 0.37 | 0.12 |
| Quality score of helpful intentions | 0.28*** | 0.19 0.38 | 0.23 | 0.19** | 0.08 0.29 | 0.16 |
| **Adjusted[c]** | | | | | | |
| Quality score of helpful intentions | 0.14* | 0.02 0.25 | 0.11 | 0.27 | -0.01 0.55 | 0.22 |

[a]Compared to male.
[b]Compared to speaking another language at home.
[c]Adjusted for gender, language spoken at home, correct recognition of the mental health problem, personal stigma, social distance, and confidence in providing help.
*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

With an increase of 1 in the quality score of avoidance of harmful intentions, the quality score of avoidance of harmful behaviours was estimated to increase 0.14 (95% CI: 0.09 – 0.19, $p < 0.001$) at 12-months, and 0.11 (95% CI: 0.05 – 0.17, $p < 0.01$) at 18-months, both smaller than those for the helpful behaviours. After adjusting for potential confounders, the strength of association remained significant at 12-months (adjusted B = 0.12, 95% CI: 0.06 – 0.18, $p < 0.001$) but not at 18-month follow-up (adjusted B = 0.11, 95% CI: -0.06 – 0.28).

**Table 3.** Linear regression results on predictors of avoidance of harmful mental health first aid behaviours among adolescents

| | 12mth follow-up (N=733) | | | 18mth follow-up (N=520) | | |
|---|---|---|---|---|---|---|
| | B | 95% CI | β | B | 95% CI | β |
| **Crude** | | | | | | |
| Age at baseline | -0.10 | -0.25 0.05 | -0.05 | 0.07 | -0.12 0.27 | 0.03 |
| Female[a] | 0.31** | 0.19 0.43 | N/A | 0.00 | -0.15 0.15 | N/A |
| Speaking English at home[b] | 0.22 | -0.01 0.45 | N/A | -0.01 | -0.25 0.23 | N/A |
| Correct recognition of the mental health problem in vignettes | 0.18 | -0.02 0.38 | N/A | 0.13 | -0.40 0.67 | N/A |
| Personal stigma | | | | | | |
| Weak-not-sick | -0.18** | -0.27 -0.09 | -0.16 | -0.15* | -0.26 -0.05 | -0.13 |
| Dangerous/unpredictable | -0.24** | -0.33 -0.15 | -0.20 | -0.16* | -0.27 -0.05 | -0.13 |
| Would-not-tell-anyone | -0.03 | -0.09 0.04 | N/A | -0.03 | -0.11 0.05 | N/A |
| Social distance | -0.09 | -0.20 0.01 | -0.07 | -0.04 | -0.18 0.10 | -0.03 |
| Confidence in providing help | -0.06 | -0.14 0.01 | -0.07 | -0.01 | -0.11 0.08 | -0.01 |
| Quality score of avoidance of harmful intentions | 0.14** | 0.09 0.19 | 0.22 | 0.11* | 0.05 0.17 | 0.16 |
| **Adjusted[c]** | | | | | | |
| Quality score of avoidance of harmful intentions | 0.12** | 0.06 0.18 | 0.19 | 0.11 | -0.06 0.28 | 0.16 |

[a]Compared to male.
[b]Compared to speaking another language at home.
[c]Adjusted for gender, language spoken at home, correct recognition of the mental health problem, personal stigma, social distance, and confidence in providing help.
*$p < 0.01$; **$p < 0.001$.

## Logistic regression results on associations of individual actions and intentions

Results of binary logistic regression models of individual mental health first aid actions and intentions are summarised in Table 4. At 12-month follow-up, all but one of the twelve measured intentions ('Ignore the person') were significantly associated with their corresponding actions. In seven of these items ('Invite to hang out', 'Suggest telling an adult', 'Suggest telling a professional', 'Ask about suicide', 'Tell the person how to fix their problem', 'Avoid talking about suicide' and 'Encourage to deal alone'), positive associations remained statistically significant as long as 18-months after the training (OR range 1.41 – 3.43).

Particularly, the two suicide-related intentions predicted corresponding actions, across the 12- and 18-month follow-up. Adolescents who intended to ask about suicide were 2.55 to 2.72 times higher in the likelihood to do so 12- or 18-month after the training. Consistent with this, participants who intended to avoid talking about suicide were more likely to do so as well (OR was 1.96 at 12-months and 1.68 at 18-months, respectively).

**Table 4.** Associations between individual mental health first aid actions and intentions among adolescents

| | 12mth follow-up (N=733) | | | 18mth follow-up (N=520) | | |
|---|---|---|---|---|---|---|
| | OR | 95% CI | *p*-value | OR | 95% CI | *p*-value |
| Listen to the person[a] | 2.55 | 1.21 5.34 | 0.013 | 0.88 | 0.28 2.74 | 0.828 |
| Approach the person[a] | 4.65 | 2.35 9.20 | <0.001 | 0.95 | 0.36 2.53 | 0.922 |
| Invite to hang out[a] | 2.78 | 1.50 5.11 | 0.001 | 2.53 | 1.22 5.26 | 0.013 |
| Suggest telling an adult[a] | 3.83 | 2.24 6.54 | <0.001 | 3.43 | 1.83 6.43 | <0.001 |
| Suggest telling a professional[a] | 2.52 | 1.55 4.11 | <0.001 | 2.10 | 1.16 3.80 | 0.014 |
| Ask about suicide[a] | 2.55 | 1.61 4.03 | <0.001 | 2.72 | 1.58 4.67 | <0.001 |
| Avoid talking about suicide[b] | 1.96 | 1.63 2.34 | <0.001 | 1.68 | 1.37 2.05 | <0.001 |
| Tell the person to fix their problem[b] | 2.78 | 1.50 5.14 | <0.001 | 1.41 | 1.15 1.73 | 0.001 |
| Encourage to deal alone[b] | 1.61 | 1.20 2.15 | 0.002 | 1.75 | 1.26 2.44 | 0.001 |
| Unfriend the person[b] | 2.01 | 1.28 3.15 | 0.002 | 1.21 | 0.55 2.63 | 0.640 |
| Ignore the person[b] | 1.68 | 0.97 2.93 | 0.065 | 1.89 | 0.91 3.93 | 0.086 |
| Do nothing[b] | 2.20 | 1.31 3.70 | 0.003 | 1.32 | 0.52 3.34 | 0.526 |

[a]Helpful items.
[b]Unhelpful/potentially harmful items.

## Discussion

Using the data from a cluster randomised controlled trial among Australian students in senior secondary schools, this study investigated the longitudinal associations between adolescents' intentions towards a hypothetical person in two vignettes and their actual help-giving behaviours to a peer with a mental health problem or crisis in real life. Results show that adolescents' mental health first aid intentions can prospectively predict their subsequent help-giving behaviours 12-months later, and such prediction remains significant up to 18 months in some individual intention-behaviour items. The magnitude of the overall intention-behaviour association (the adjusted standardised linear regression coefficient β was 0.11 for helpful and 0.19 for avoidance of harmful, respectively, at 12-month follow-up) was similar to that reported of Australian young people aged 12 – 25 years at 2-year follow-up (β = 0.13) (Yap & Jorm, 2012). Findings from the present study provide more robust insights to the longitudinal associations between mental health first aid intentions and behaviours among adolescents, underscoring that the effectiveness of training programs in improving intentions is likely to

translate into better quality help-giving behaviours later on when adolescents are faced with real-time scenarios with peers.

There were several covariates that also significantly predicted behaviours at follow-up. These included that correct recognition of the mental health problem in vignettes, along with higher confidence in providing help, were positively associated with helpful behaviours and negatively with harmful behaviours. Conversely, higher levels of personal stigma and social distance were associated with the opposite pattern of behaviours. These findings are in line with the theory of planned behaviour (Ajzen, 1991), according to which one's knowledge, attitudes and confidence can influence the engagement in a behaviour via enhanced intention. Additionally, we observed that some demographic factors were significantly related to the quality of both helpful and harmful behaviours, with being female and speaking English at home as protective factors, which is similar to the findings from other studies on adolescents' first aid actions (Hart et al., 2018).

Adolescent mental health first aid prioritises involving adults in assisting peers coping with mental health problems (Ross et al., 2012). In this study, we observed that, whereas 76-80% of students expressed an intention to suggest their friend with a mental health problem or crisis telling an adult ('Suggest telling an adult') or professional ('Suggest telling a professional'), only 54-63% of them reported actually taking these actions during the 12-/18-month follow-up, indicating relatively wide intention-behaviour gaps in terms of involving adults. Nevertheless, data show statistically significant longitudinal associations between intentions to involve an adult/professional at baseline and their corresponding actions at both the 12- and 18-month follow-ups (OR values ranged 2.10 to 3.83, Table 4). Prior research has underscored the crucial role of adults in supporting adolescents' mental health (Breslin et al., 2022; Gonsalves et al., 2023). Building upon this foundation and the existing evidence on the effectiveness of tMHFA training in enhancing intentions (Hart et al., 2022), the observed strong intention-action associations of telling an adult/professional in this study suggest that tMHFA has the potential to yield positive impacts on early intervention, suicide prevention, and overall mental health outcomes for adolescents, through facilitating increased support from adults and earlier help-seeking to professionals.

Suicidal behaviours are among the most critical emergencies for adolescents (Bukstein, 2022). Results from this study show that the two suicide-related intention items (i.e., 'Ask about suicide' and 'Avoid talking about suicide') can predict subsequent helping actions, as long as

18-months after the training delivery. Despite this, the two suicide-related items were less likely to be correctly endorsed as intentions at baseline, or to be taken as behavioural actions at follow-ups. They also had wider intention-behaviour gaps compared to other items (as demonstrated in Fig. 1). Consistent with this finding, evidence from a systematic review on adolescent help-giving for suicidal ideation and self-harm in peers, and epidemiological surveys on youth mental health first aid also found that young people are reluctant to ask their peers about suicide risk or self-harming behaviours (Subasinghe et al., 2023; Yap & Jorm, 2012). It can be a challenging task for adolescents to provide help to peers with mental health problems, particularly in a crisis situation like when there is a risk of suicide, which requires a high degree of emotional maturity and commitment (Ross et al., 2012). It appears to be necessary to enhance guidance to adolescents on how to assess the suicidal risk of a peer and improve their capacity of offering help in an appropriate way.

This study has several strengths, particularly its longitudinal design, relatively large sample size and inclusion of comprehensive information on covariates, leading to more reliable results. In particular, adolescent mental health first aid intentions and behaviours were measured using tools with established validation and reliability in their application to adolescents, which provides a consistent basis for comparison in future similar studies.

However, the study also has several limitations. Firstly, the mental health first aid behaviours were self-reported, where participants were asked about their situations in the previous 12- or 18-months, and the responses may thereby be subject to recall bias or be influenced by social desirability. Nevertheless, comprehensive measures were implemented to mitigate these biases. For instance, the survey questions were formulated using clear and age-appropriate language to enhance accuracy and understanding. Additionally, the surveys were conducted anonymously (i.e., student ID served as the only identifier for matching survey data across different time points, and no personal information, such as names, was collected) and in private to ensure participant confidentiality, thus minimising the risk of social desirability bias. Secondly, the follow-up data collection coincided with the COVID-19 pandemic in the Victorian State of Australia during 2020 - 21, resulting in relatively high attrition in the sample. Such attrition could have influenced the precision of estimates on the intention-behaviour associations (i.e., wider 95% CIs) via a smaller sample size at follow-ups, but its influence on their magnitudes can be limited, as no significant difference observed in the baseline intention scores between schools attending and missing at following-up surveys. Lastly, this study only

included participants who had provided help to a peer with a mental health problem, but the risk of bias is likely minimal because most adolescents provided help and the majority of instances where help was not provided were due to objective circumstances (e.g., 'Peer being helped by others', 'Peer living far away', or 'I don't know how to'), rather than a lack of first aid intentions (Morgan & Rossetto, 2022).

To conclude, findings from this study show that adolescents' mental health first aid intentions prospectively predict their subsequent help-giving behaviours towards peers experiencing mental health problems or in crises, suggesting the effectiveness of training interventions in improving adolescents' intentions, like the tMHFA program, may indeed translate into effective supporting behaviours. Future studies are warranted to examine the effect size of such training programs on changing mental health first aid intentions, as well as their effectiveness in improving other potential factors that can predict supportive behaviours. Further efforts are also needed to narrow the gap between certain intentions and behaviours, particularly those related to seeking help from adults/professionals and suicide.

### Supplements

1. The Mental Health Support Scale for Adolescents (MHSSA)
2. The Scale of Social Distance
3. The Personal Stigma Scale


### Funding

This research was supported by an Australian National Health and Medical Research Council (NHMRC) Grant (APP1120604). S.L. and A.J.M. were supported by a NHMRC Investigator Grant (1172889). A.J.M. was also supported by a CR Roper Fellowship from the University of Melbourne. L.M.H. was supported by an Australian Rotary Health Colin Dodds Postdoctoral Fellowship and a VESKI Research Fellowship. The funders had no role in study design, data collection, data analysis, or data interpretation.

### Acknowledgements

We would like to thank the lead staff members at each of the participant schools who assisted to implement the trial.


### Declarations

### Ethics approval and consent to participate

Ethics approval for the trial was obtained from the Human Research Ethics Committee at the University of Melbourne (approval ID 1341238.4) and Victorian Department of Education (approval ID 2014_002268). All procedures performed in this study were in accordance with the Code of Ethics of the World Medical Association for experiments involving humans. All participating students were given a Plain Language Statement and provided informed consent online. The parent/guardian of students were also informed of the study and their passive consent were sought and obtained for students' participation.

### Consent for publication

Not applicable.

### Conflict of interest

A.F.J. is on the Board of Directors of Mental Health First Aid International (trading as MHFA Australia). L.M.H. is a Director of the not-for-profit health charity The Body Confident Collective. The two authors will not benefit financially or otherwise from the publication of this research. All the other authors declare that they have no competing interests.

### Data availability statement

Raw data of this study cannot be shared due to ethical restrictions in accordance with the approved research protocol from the University of Melbourne and Victorian Department of Education under which the study was conducted, but de-identified data are available from the corresponding author on reasonable request.

### Author contributions

S.L., L.M.H., A.F.J. and A.J.M. contributed to development of the study, K.G. provided research support and worked with stakeholders. S.L. conducted data analysis and drafted the manuscript. All co-authors reviewed and commented on the manuscript.

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