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**AUTHOR ACCEPTED MANUSCRIPT PUBLISHED IN CHILD AND ADOLESCENT
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SafeSpot: an innovative app and mental health support package for Scottish schools. A qualitative analysis as part of a mixed methods study.

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Ethical Considerations

Ethical approval for this study was granted by the University of Glasgow college of Medical, Veterinary and Life Sciences (MVLS) ethics committee in February 2017. Consent was obtained from parents of pupils included in focus groups in the study

using consent forms. These consent forms covered participation in the group, audio-recording and use of quotations.

Conflicts of Interest: The authors have no conflicts of interest.

SafeSpot: an innovative app and mental health support package for Scottish schools.

A qualitative analysis as part of a mixed methods study.

Abstract:

AIMS

The aim of the study was to investigate teachers' and pupils' perceptions about the effect of the SafeSpot mental health curriculum on the wellbeing of young people and on their knowledge of mental health conditions. This trial intends to determine the acceptability and benefits of web and mobile technology in delivering emotional wellbeing in schools, through use of the SafeSpot programme.

BACKGROUND

With 10% of young people aged 5 to 16 diagnosed with a mental disorder; there is pressure for schools to address their pupils' emotional wellbeing. However, many educators report that their schools have insufficient provisions and feel inadequately equipped to support pupils' mental health.

METHODS

This qualitative analysis was embedded within a randomly allocated stepped-wedge design, conducted in six West of Scotland secondary schools. 2320 pupils (aged 11 to 14 years) and 90 teachers were included. Young people's understanding of health-seeking, and teacher's confidence in delivering and accessing wellbeing information was assessed qualitatively.

RESULTS

Qualitative analysis revealed themes highlighting the beneficial nature of SafeSpot, including pupil engagement, content of tutorials, perceived impact of SafeSpot and level of training provided for teachers.

CONCLUSIONS

Web technology could potentially offer a more structured way for staff to support their pupils' mental health, whilst reducing stigma. SafeSpot was perceived, by pupils and teachers, to be engaging.

Key Practitioner Message

- Mental health problems are becoming increasingly prevalent in young people with an estimated 10 to 20% of children worldwide and 10% of children in Great Britain requiring referral to specialist CAMHS services.
- Despite current treatment strategies, mental health conditions in young people often have a lasting impact on a child's educational attainment and later on their physical and mental health.
- There is growing research into the use of web and mobile phone-based treatments for mental health conditions; however little evidence currently exists into the acceptability and effectiveness of mental health app use in adolescents.
- The SafeSpot digital educational programme was created by two consultant psychiatrists to raise awareness of emotional wellbeing, improve young people's mental health and help with development of helpful coping strategies.
- The qualitative aspect of this mixed methods study evaluated the views of a range of pupils and teachers from 5 different schools on the SafeSpot curriculum, website and mobile phone app.
- This is a unique and innovative study highlighting the potential to further develop mental health awareness programmes, incorporating both classroom activities and a mobile app, that are likely to improve mental health and resilience in young people.

Introduction

Mental health problems are becoming increasingly prevalent in young people (1) with an estimated 10-20% of children worldwide aged 9 to 18 years having experienced a mental health problem (2). British studies show that 10% of children aged 5 to 15 years have a diagnosed mental disorder (3). Over half of mental health conditions begin during childhood and adolescence (4)(5). In Great Britain approximately 5% of children aged 5 to 15 years have a conduct disorder, 4% an emotional disorder and 1% hyperactivity (3). The prevalence of certain mental health conditions, such as depression, rise dramatically during adolescence (6). Mental health conditions are linked to lower school attendance, troubles with friends and family and alcohol consumption (3).

Treatment and Prevention

Current treatment for child mental health conditions include medication, cognitive-behavioural based therapies and family therapy (7). However, despite treatment these conditions can still have a lasting impact on a child's educational attainment and later physical and mental health (7). For instance, adolescent depression has been linked to future anxiety and bipolar disorders as well as suicidal behaviour and unemployment (8). Therefore, it may be beneficial to use prevention strategies to reduce the prevalence of these conditions. Some prevention strategies have been linked to decreased onset and symptoms of certain mental health conditions, as well as associated socio-economic benefits (2,9).

Previous programmes targeting social-emotional learning in schools have shown improved social competence and reduced mental health conditions (9). These have also been linked to better academic results (9).

Current government policy is focussed on improving strategies to manage mental health difficulties in young people, which has put additional pressure on schools across the UK. One of the aims of the NHS Scotland Mental Health Strategy, for example, is that every child and young person should have appropriate access to emotional and mental well-being support in school (10) This is something that the SafeSpot programme has been designed to address.

Technology-based mental health treatments

There is growing research into the use of web and mobile phone-based treatments for mental health conditions. Reviews of mobile based mental health apps identified that they have potential to be effective in improving mental health (11,12). However, there are many apps available without any evidence base and little evidence for their effectiveness (11). A CBT-based app for adults called Catch-it has shown an improvement in positive mood following use but impact was limited by lack of uptake (13).

Results on the efficacy of computerised CBT are mixed. An RCT found it to be no more beneficial than standard GP care when in normal healthcare settings (14). Whereas, meta-analyses have found an improvement in depressive symptoms using

computerised CBT and psychological therapies (15,16). An improvement in general health status has also been noted (15). These varying results with computerised therapies may be due to different adherence rates, which are thought to have a significant impact on the intervention's effectiveness (14,17). Such studies have highlighted that these interventions are more effective when they are supported by therapists or caregivers (16,18). This may be due to an improvement in adherence rates and lower dropout rates (16). eHealth interventions have also been indicated to prevent future anxiety and depression (18).

Studies have indicated that online mindfulness-based interventions (MBI) may improve mental health (17). However, effect sizes are often small and not as good as those for face- to-face mindfulness (17). Web-based acceptance and commitment therapy (ACT) has also been shown to reduce levels of depressive symptoms and improve mental health, with some effects maintained up to 12 months after (19). However, research on mental health apps and websites have often attracted well-educated women as participants who may have different levels of adherence and understanding to the general population (13,19).

The use of apps and technology developed for young people have produced similarly mixed results (20, 21, 22). Although adolescents have found them to be useful, they have still had limited adherence (21,22). Therapist support offers one way of improving longer-term engagement with mental health applications (20). Peer support strategies have also been trialled as a useful strategy to promote effective mental health app use, but there is a lack of work in this area (22). Studies agree that further research is needed into the effect of these apps on the mental health of young people (20,22).

SafeSpot

The SafeSpot programme was created by two consultant psychiatrists to raise awareness of mental health problems in young people and signpost them to appropriate support and resources. SafeSpot aims to combine classroom tutorials on mental wellbeing, a website and a mobile app, as well as peer support, with the aim of helping young people develop coping mechanisms, improve their mental health and reduce stigma.

A pilot study on SafeSpot utility was conducted with 650 pupils aged 11 to 15 in 2015 in a large Scottish secondary school (23). Teachers reported that SafeSpot seemed to improve the pupils' understanding of mental health conditions, that the content engaged pupils well, especially with the support of the app and of specifically trained older pupil peer supporters, called "SafeSpotters". Some teachers felt they needed more training on the topics covered. These comments have since been used to adjust the SafeSpot programme.

The current study aimed to investigate teachers' and pupils' perceptions about the effect of the SafeSpot programme on the wellbeing of young people and on their knowledge of mental health conditions.

Method

To address the research questions, a mixed methods research approach was adopted. As a research group, it was decided that a mixed methods approach, utilising both qualitative and quantitative data, would provide the robust answers required in a complex research project such as this. Combining methods adds value because figures demonstrate measurable impact whilst descriptions are illustrative of- and provide context to- what the quantitative data represents.

This paper focusses on the qualitative aspect of this mixed methods design study by exploring teachers' and pupils' perceptions of SafeSpot.

The study was embedded within a stepped-wedge feasibility study conducted in 2017 with 2320 pupils in 6 schools. Five of these schools gave consent for qualitative focus groups. 31 pupils and 30 teachers in total were invited to be included in the focus groups. All pupils were given the SafeSpot programme and teachers' and pupils' views were explored in focus groups.

Ethical approval for the study was given by The University of Glasgow Medical, Veterinary and Life Sciences Ethics Committee in February 2017.

The SafeSpot package used in the study consists of school tutorials, a website and mobile app. It also includes a programme through which older pupils, known as SafeSpotters, are trained in SafeSpot material to provide guidance to younger pupils. School tutorials, which were delivered by teachers to all 2320 pupils during Personal and Social Education (PSE) lessons, contained information on mental health issues and coping techniques. All pupils were also given access to the SafeSpot app and website, which contained further materials to reinforce the tutorials. Some teachers gave pupils an opportunity to use the app at the end of classes.

Teachers and SafeSpotters were trained through one day of face to face training and comprehensive information packs on the SafeSpot material.

Six schools across Scotland participated in this study. These schools were recruited through an advert to participate issued by the NHS and Education Scotland. The first six schools to reply were then selected to take part in the study. The schools recruited were in a range of areas with varying socioeconomic backgrounds. Those participating in the mixed methods study were pupils aged 11 to 14 years old, their teachers and the SafeSpotters. Parents were informed of the study and given the opportunity to opt their child out of the data collection. Older pupils were asked to volunteer to be SafeSpotters.

Focus groups were all conducted at the end of the study. Focus groups lasted about an hour, during which a facilitator guided discussion about the SafeSpot programme. The focus groups were all audiotaped to be analysed later. Consent was obtained prior to commencing focus groups using consent forms. These consent forms covered participation in the group, audio-recording and use of quotations.

There were separate consent forms for both the quantitative data and the qualitative aspect of the study. One of the 6 schools did not give consent to collect data from the focus groups but did give consent for quantitative data. Therefore the qualitative aspect of the study was based on 5 schools not 6.

Information sheets were provided to both students and parents at least 24 hours prior to consent being taken. These were pre-prepared by the SafeSpot research team and included a Participant Information Sheet (PIS) and Opt-out form. The teachers then distributed these to their students and instructed them to bring them home for discussion with their parents. Students were also given a copy to read themselves. If a child's parent did not return an opt-out form, consent was collected from students by the PSE teacher at the beginning of the first SafeSpot lesson and then given to a researcher.

In total, 90 teachers, 2320 pupils and 12 SafeSpotters from 6 schools participated in the trial. Out of those, pupils and teachers were invited to volunteer to take part in the focus groups at their school. SafeSpotters were unable to participate in focus groups due to exam commitments.

Two pupils from each year group were requested by their respective teachers to partake in focus groups so that there was a minimum total of six pupils per school anticipated. Pupils who were selected had all received the SafeSpot mental health curriculum in their classes. They were in secondary school years 1 to 3 (11 to 14 years). To encourage pupil engagement, teachers selected pupils based on these criteria and their availability to attend focus groups. One school had 5 pupils in a focus group, with 3 schools including the expected number of 6 pupils and 1 school included 8 pupils. Teachers were invited to take part in separate focus groups. There were approximately six participants in each of the teacher focus groups.

Information from the focus groups was transcribed into Microsoft word documents. Data transcribed by volunteers was checked again for accuracy by a member of the research team who had been present at the focus group. Thematic analysis of the transcription was then carried out by six researchers following the technique suggested by Braun and Clarke (24). This aimed to identify patterns in the data without using an established framework for theme. This avoids imposing a pre-existing structure on the data.

Results

Thematic analysis identified four main themes in the qualitative data relating to perceptions of SafeSpot. These themes were 'pupil engagement', 'content of tutorials', 'perceived impact of SafeSpot' and 'level of training provided for teachers'.

Pupil Engagement

The website and app were created to reinforce the content of the tutorials and further pupil engagement. However, engagement with them was mixed. Some found that the app was a useful way to enhance the content.

'I think it's brilliant, like kids are stuck to their phones, absolutely glued to their phones, so like reaching out to them in that was I think is good' **T1**

'It helped me, I have a bit of anxiety and I went on the SafeSpot app and went through it all.' **P1**

However, others did not show the same level of interaction with the app. The reasons given for not using it included lack of time to use the app in class, limited phone storage space and feeling that it was unnecessary for them.

'I didn't use the app. In all honesty I've never even tried it' **P2**

Pupil engagement seemed to depend on the amount of time that teachers gave to the app in class. Some teachers gave time to the app during class whereas others felt that they required a designated time for it.

'My pupils were on the app or the website at the end of every period because they liked... when I finished the PowerPoints we went onto the website, they went on the app on their phone and did some of the relaxation games or they looked through the app and they really enjoyed that for the last 10-15 minutes' **T2**

'A lot of pupils didn't really know much about the app... we kept referring to it every lesson. So maybe if it... even had more of an interactive lesson with using the app' **T3**

Content of tutorials

One of the themes that became apparent during focus groups was that the content of the tutorials may need to be altered. Some of the participants thought that the content overlapped with things that they had already been taught. However, others thought that it still provided a different perspective to the information.

'... a lot of the time it was stuff that we had been taught about before' **P3**

'... a lot of it is content that we cover in PSE anyway, but it comes from a different angle and with the kind of continued thread of mental health and wellbeing' **T4**

Pupils also noted that there was little continuity across the tutorials, as they covered such a large range of topics.

'We just done questionnaires and then just went onto the next topic, it was as if it was just totally forgotten about' **P4**

'...some of it was very confusing because one week we'd do a topic and then completely change it for the next week, no like continuation' **P5**

The level of understanding and vocabulary expected from the pupils was suggested to be too high. Focus group participants also thought that the lessons could be more interactive to increase the pupils' participation and enjoyment.

'I had the second year. The language was way beyond their understanding' **T5**

'...they could have probably been a little bit more fun, a bit more like excitement from the teacher' **P6**

Perceived impact of SafeSpot

One of the themes that emerged was that participants perceived a positive impact of SafeSpot. This was noted through improved understanding and normalisation of mental health problems.

Some teachers highlighted that over the course of the SafeSpot programme pupils became more confident and open in discussing mental health issues that they have experienced.

"...the kids have engaged in it and they have kind of talked to us about some of those really sensitive issues whereas I don't think they would have in the past..." T9

"a lot of my class openly said that they felt they can connect with a lot of the things we were talking about, they do suffer a bit from mental health... they were quite confident towards the end just talking about it I think" T10

Pupils also felt that they had a greater level of understanding of mental health conditions and their effects. They described confidence in knowing strategies to help manage these conditions.

"I am much more aware of the types, symptoms or... just more educated" P8

"I just think it is something we have never done before, so it has given us all a bit of more of an understanding of like how to cope with different things and like different things that are going on in other people's lives that you might not know about" P9

"When we were doing the anxiety, like a lot of people in the class did have anxiety by that point but then they learned how to deal with it" P10

SafeSpot was thought to reduce the stigmatisation of mental illness. However, it was noted that further work was needed to normalise it completely.

"... I think as you continue to kind of teach a lot of these topics the stigma does reduce and does disappear and they do open up and they do feel safe talking about it..." T11

"...I think the stigma is lowered a lot, but there is still some there and people still do get kind of quiet" P11

Level of training required for teachers

Many of the teachers thought that their confidence in delivering information about mental health conditions such as psychosis improved with the SafeSpot training. They thought that the additional resources were especially helpful.

"I thought the support material was excellent... So definitely myself more confident now having taught it and also having read through all the support material" T15

"I think it has really boosted my confidence in terms of teaching health and wellbeing" T16

However, some teachers and pupils were of the opinion that extra support and training was still required to deliver the information, especially regarding sensitive topics.

"I attended the training day and the training day covered all the materials...but I think maybe going into materials in more depth and maybe with suggestions of this is something that you might want to go down the root of in you lessons" T17

"I think more teachers could have probably been like told a little bit better" P12

Discussion

Our qualitative findings indicate that teachers support the SafeSpot programme as a potentially useful intervention but that certain changes could improve it for the future. Teachers thought that pupil engagement with the application and website resources was mixed and that ensuring time is designated for the app in class would be valuable. This mixed level of engagement is supported by other studies showing limited adherence to mobile based mental health treatments (14, 22).

There is a wide number of mental health applications available but without consistent engagement it is difficult to monitor efficacy and quality. Previous published studies are few in number but have demonstrated that use of mental health mobile phone tools is helpful for young people, particularly for facilitating discussion about assessing and managing mental health difficulties, provided engagement is adequate (25,26). This study manages to capture both young people's and their educator's qualitative feedback regarding use of a clinician-developed mental health app as part of the SafeSpot mental health curriculum delivered within class time. Increasing use of the app during class would further improve the effect of SafeSpot on mental health. An overlap was identified between tutorial content and information that pupils had already been taught in Personal and Social Education (PSE). Focus group participants suggested modifying the content of - and improving the continuity between - tutorials to make the information more accessible and interesting for younger pupils. Some teachers also thought that there was too much tutorial content. Simplifications will therefore be made to tutorials for the future.

Timing was especially difficult for schools participating in the second wedge of the study as older pupils were busy in the lead up to exams and therefore it was not possible to include SafeSpotter's feedback as part of qualitative analysis.

A strength was the relatively large number of participants included with a respectable number per focus group. This allowed for a range of feedback from pupils and teachers to be included; although the qualitative data from one school had to be excluded as their consent forms were not returned. The pupils that were selected to be involved in focus groups were engaged and enthusiastic. The qualitative findings reported add weight to the previous pilot school-based intervention using the SafeSpot programme, which showed positive results both with improving mental health awareness and prevention strategies, and on reducing included pupils' levels of emotional distress (23).

Both pupils and teachers perceived the effect of SafeSpot to be positive. The programme was thought to improve the pupils' understanding of mental health conditions. This increased their confidence in talking about these issues and reduced the stigma surrounding them, although some teachers noted that more work is needed to reduce stigma further. This perceived positive impact of SafeSpot corresponds to positive feedback from young people about other mental health apps (13, 21, 23).

This study demonstrated participant interest and compliance with the Safespot curriculum across a wide geographical area of Scotland, suggesting beneficial outcomes if this study was able to be replicated with a larger cohort.

Overall, it is evident from the literature that preventative approaches to mental health have a wide range of benefits for children and young people. Government policy, developed from population data analysis, continues to recommend schools as potential sites through which such programmes can be implemented (10). However, despite this schools do not routinely incorporate such interventions within class time (27). There is also a need for innovative and accessible ways for young people experiencing mental ill health to receive support. Peer support programmes and mobile health applications are favourable options; however, more research is required in this area to strengthen the evidence base. The SafeSpot mental health app, website and curriculum are promising resources that could be utilised for primary and secondary prevention of mental health difficulties within a school setting.

Limitations

This mixed methods study was conducted in six schools from both urban and rural parts of Scotland which improves the external validity and generalisability of the study. However, this meant that the study could not be completely standardised as teachers delivered the SafeSpot material differently with different amounts of lesson time dedicated to usage of the app. Recommending that pupils are given the same amount of time to use the app in the classroom could improve pupil engagement in future.

Pupils who participated in the focus groups were selected by teachers who knew their pupils, rather than researchers, which limited the ability to explore a wide range of views from pupils. Due to time pressures, the focus groups were also biased towards including teachers who were interested and available. Ideally it would have been preferable to have included more teachers in the focus groups and to have delivered more teacher and Safespotter training days in order to improve internal validity of the study. Furthermore, 1 school out of 6 included in the stepped wedge design did not hand in consent forms and therefore only 5 schools were able to participate in the focus groups.

A further limitation encountered by researchers was that, due to the time of year that the focus groups took place, Safespotter were on exam leave and hence were not available to participate in separate focus groups.

This qualitative analysis is part of a mixed methods study. By its nature, qualitative data does not give an objective measure of the effect that SafeSpot had on the

pupils' mental health. However quantitative data also collated within the stepped wedge design will add depth to analysis of pupils' and teachers' feedback, as detailed in this paper. Themes that emerged from study of the qualitative data collated do however highlight which aspects of the programme were most pertinent to participants.

Finally, the study was limited by relatively short length of follow up time and further studies would benefit from longitudinal data regarding pupils' use of mental health resources, such as the SafeSpot package.

Implications for future research and clinical practice

This study contributes towards the growing research base into the use of mobile phone-based treatment and prevention strategies for mental health conditions. The study has demonstrated positive feedback for the SafeSpot programme and indicates that there is potential to develop mental health awareness programmes incorporating both classroom activities and mobile apps.

The project has indicated that the content of SafeSpot tutorials needs to be better tailored towards the pupils. Changing the time of year of implementation of the programme, so that older pupils can participate as SafeSpotters without clashes with exams, as well as providing more SafeSpot training for teachers could also improve SafeSpot's impact.

Future research will be required to objectively evaluate the cost-effectiveness of SafeSpot on the mental health of pupils over a longer time period. It will also be helpful in future to investigate which components of the SafeSpot programme are most effective.

Conclusion

Pupils and teachers perceived SafeSpot to be engaging and to be likely to both improve pupils' mental health and reduce stigma in schools.

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