

Designing smartphone mental health applications for emergency service workers

M. Deady¹, D. Peters², H. Lang¹, R. Calvo², N. Glozier³, H. Christensen⁴ and S. B. Harvey^{1,4,5}

¹University of New South Wales, Sydney, New South Wales 2052, Australia, ²School of Electrical and Information Engineering, University of Sydney, Sydney, New South Wales 2006, Australia, ³Brain and Mind Centre, University of Sydney, Sydney, New South Wales 2006, Australia, ⁴Black Dog Institute, Sydney, New South Wales 2031, Australia, ⁵St George Hospital, Sydney, New South Wales 2217, Australia.

Correspondence to: M. Deady, School of Psychiatry, University of New South Wales, Black Dog Institute Building, Hospital Rd, Randwick, New South Wales 2031, Australia. Tel: +61 02 9382 4517; fax: +61 02 9382 8208; e-mail: m.deady@unsw.edu.au

Background	Emergency service workers are often exposed to trauma and have increased risk of a range of mental health (MH) conditions. Smartphone applications have the potential to provide this group with effective psychological interventions; however, little is known about the acceptability and preferences regarding such initiatives.
Aims	To describe the preferences and opinions of emergency service workers regarding the use of smartphone MH applications and to examine the impact of age on these preferences.
Methods	Participants were recruited from four metropolitan Fire and Rescue NSW stations and responded to questionnaire items covering three key domains: current smartphone use, potential future use and preferences for design and content as well as therapeutic techniques.
Results	Overall, approximately half the sample ($n = 106$) claimed they would be interested in trying a tailored emergency-worker MH smartphone application. There were few differences between age groups on preferences. The majority of respondents claimed they would use an app for mental well-being daily and preferred terms such as ‘well-being’ and ‘mental fitness’ for referring to MH. Confidentiality, along with a focus on stress, sleep, exercise and resiliency were all considered key features. Behavioural therapeutic techniques were regarded most favourably, compared with other therapies.
Conclusions	Emergency workers were interested in utilizing smartphone applications focused on MH, but expressed clear preferences regarding language used in promotion, features required and therapeutic techniques preferred.
Key words	Apps; design features; emergency workers; fire fighters; first responders; mental health; mHealth; smartphones.

Introduction

Emergency service workers, such as firefighters, are exposed to elevated rates of trauma, putting them at increased risk for a range of mental health (MH) conditions [1]. Despite the risks associated with their work, these workers are less likely to access traditional MH services [2].

Due to widespread use and technological advancements, mobile phone-based health initiatives (mHealth) have become an increasingly popular way to provide care/support to individuals, overcoming traditional service barriers [3], especially in difficult-to-access populations. Before these interventions can be effective, they require uptake and adherence. Engaging a target audience in the

process of development is essential for developing optimum treatments in specific settings and is likely to contribute to the wider acceptability and utility of the resource [4].

Little is known about the use of work-based smartphone technology among emergency service workers and the factors that might play a role in intervention uptake. This study aimed to describe the use and preferences of emergency service workers regarding potential uptake of smartphone-based MH interventions.

Methods

Participants were firefighters from four metropolitan Fire and Rescue NSW (FRNSW) stations. Approval was

obtained from FRNSW and Sydney University Human Research Ethics Committee (2015/652), all participants provided informed consent. Surveys were conducted over 4 days (corresponding to the platoon schedule), to ensure that all firefighters could participate.

Survey questions pertained to current smartphone use, potential future use and preferences for design and content. Respondents rated their preferences and likely use of different apps and features on four-point Likert scales ('irrelevant'/'very unlikely' to 'very important'/'very likely'). Respondents were also presented with a list of MH-related words and descriptions and examples of specific therapeutic techniques used and asked to select their preference.

Analyses were conducted using the Statistical Package for the Social Sciences (SPSS 20.0 [5]). Age was dichotomized into ≤ 40 and > 40 years. Chi-square was used to compare age groups on categorical variables ($P < 0.05$ was considered statistically significant).

Results

A total of 106 firefighters (88% male), aged from 22 to 62 years ($M = 37.8$; $SD = 9.51$) participated in the survey. Of the stations surveyed, 14 firefighters were unavailable to take part in the survey and two declined (response rate = 87%). The majority of the sample used a smartphone daily (95%), with two respondents never using a smartphone.

Overall, two thirds (64%) of respondents claimed they were 'likely'/'very likely' to try a tailored emergency service worker physical health app (Table 1), while 54% claimed they were 'likely'/'very likely' to try a similar MH app. A physical health app was more favourably endorsed

in those aged ≤ 40 years ($\chi^2_1 = 4.86$, $P < 0.05$). No age difference was found for likely use of a MH app.

The majority (74%) of respondents claimed they would use an app for mental well-being daily if they were feeling low, with 60% claiming they would use an app for at least 5 min/day. Only 6% claimed they would never use the app (no age differences). Overall, 42% of respondents preferred face-to-face MH support, 17% preferred app format and the remainder had no preference.

When asked which terms were most appropriate for use in a MH app for emergency service workers, 'well-being' (54%) and 'mental fitness' (54%) were rated as the most preferred terms for referring to MH. 'Resilience' (36%) and 'stress' (30%) were also popular. Less popular terms included 'emotional well-being' (21%), 'mental health' (19%) and 'psychological health' (16%).

Confidentiality/privacy (95%) and stress/well-being (95%) were rated as the most important features (Figure 1). Sleep/exercise/lifestyle (94%) and resiliency (89%) were all rated highly. Although 75% of respondents believed it was important/very important that the app be industry-specific, 77% believed it was important/very important to be totally separate from their employer. Union endorsement was less important (51%). Only 35% wanted the ability to compare their statistics with others. Three quarters (76%) wanted a mix of audio/visual/text content, 16% wanted mostly visual content, few reported wanting mostly audio (3%) or text (2%). Behavioural therapy (75%) was the most popular preference for different psychological therapeutic techniques, followed by relaxation/mindfulness (53%), and cognitive techniques (43%). Positive psychology (32%) and interpersonal therapeutic (27%) techniques were less popular.

Table 1. Preferences for eHealth-focused smartphone application use

	Aged ≤ 40 years ($n = 65$), n (%)	Aged > 40 years ($n = 41$), n (%)	χ^2 (P value)
Use of a physical health app			4.862 ($P < 0.05$)
Unsure/unlikely	18 (28)	20 (49)	
Likely/very likely	47 (72)	21 (51)	
Use of a MH app			0.175 (NS)
Unsure/unlikely	29 (45)	20 (49)	
Likely/very likely	36 (55)	21 (51)	
Maximum time I would devote to a MH app			2.444 (NS)
> 5 min/day	42 (65)	21 (51)	
2 min/day	7 (11)	8 (20)	
Weekly	10 (15)	8 (20)	
I would not use it	4 (6)	2 (5)	
Format preference			0.520 (NS)
App	11 (19)	6 (15)	
Person	23 (39)	18 (46)	
Either	25 (42)	15 (39)	

NS, non-significant.

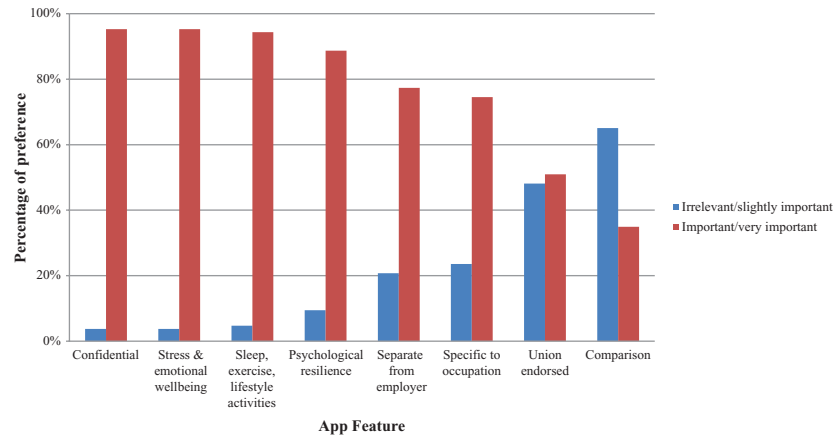


Figure 1. Importance of specific features in MH smartphone applications.

Discussion

This study found that this group of emergency service workers was largely willing to utilize MH apps, but had clear preferences. Understanding end-user preferences is vital in the development of future interventions in any population [4], particularly those that have been traditionally difficult to engage. This is the first time that preferences of emergency service workers have been examined.

Despite evidence suggesting uptake of online programs is less common in older populations [6], the only significant age difference was an inclination in favour of physical health applications in younger firefighters. This younger group were, however, less likely to try a MH app compared with a physical health app, suggesting barriers such as stigma may remain [7].

A focus on ‘fitness’ and ‘well-being’ was favoured over more stigmatizing ill-health concepts, as indicated by the preferred terminology and app features. Similarly, there was a clear preference for behavioural therapeutic approaches. This is in line with research suggesting men prefer more directive/active approaches to psychological therapy [8,9]. There was heightened concern over confidentiality/privacy and although industry-specificity was important, it appeared important that the app be separate from the employer. These findings suggest a concern with disclosure of MH issues and implications on employment, raising the need for appropriate security protocols and clear communication of independence by any research/clinical workplace initiatives.

This study is not without limitations. The views of urban firefighters might not be generalizable to other countries, regions, other emergency service workers or industries. Secondly, these data only allow inference around preference and do not actually reflect usage, uptake in real-world settings or effectiveness of an intervention. Thirdly, although features/concepts were adequately described, survey length precluded exhaustive description. Finally, limited numbers of female firefighters hindered gender comparison.

Overall, this group of emergency service workers, an at-risk, difficult to engage occupational group, were open to using smartphone-based MH applications. However, such workers expressed specific preferences regarding language, features and therapeutic techniques. Those developing new smartphone-based interventions should be mindful of these preferences in maximizing engagement and uptake.

Key points

- Approximately half the sample of emergency service workers claimed they would be interested in trying a tailored mental health smartphone application.
- Clear preferences regarding language used in promotion, features required and therapeutic techniques were present, but few age differences were detected.
- The findings have implications for the development of mental health interventions in this and other at-risk occupational groups.

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Conflicts of interest

None declared.

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