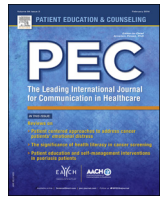




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# Integrating service user and practitioner expertise within a web-based system for collaborative mental-health risk and safety management

Christopher D. Buckingham<sup>a,\*</sup>, Ann Adams<sup>b</sup>, Laura Vail<sup>b</sup>, Ashish Kumar<sup>c</sup>, Abu Ahmed<sup>c</sup>, Annie Whelan<sup>d</sup>, Eleni Karasouli<sup>e</sup>

<sup>a</sup> Computer Science, Aston University, Aston Triangle, Birmingham B4 7ET, UK

<sup>b</sup> Division of Mental Health and Wellbeing, University of Warwick, Coventry, UK

<sup>c</sup> Computer Science, Aston University, Birmingham, UK

<sup>d</sup> Mental Health Providers' Forum, London, UK

<sup>e</sup> Institute of Digital Healthcare, University of Warwick, Coventry, UK

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### ABSTRACT

**Objectives:** To develop a decision support system (DSS), myGRaCE, that integrates service user (SU) and practitioner expertise about mental health and associated risks of suicide, self-harm, harm to others, self-neglect, and vulnerability. The intention is to help SUs assess and manage their own mental health collaboratively with practitioners.

**Methods:** An iterative process involving interviews, focus groups, and agile software development with 115 SUs, to elicit and implement myGRaCE requirements.

**Results:** Findings highlight shared understanding of mental health risk between SUs and practitioners that can be integrated within a single model. However, important differences were revealed in SUs' preferred process of assessing risks and safety, which are reflected in the distinctive interface, navigation, tool functionality and language developed for myGRaCE. A challenge was how to provide flexible access without overwhelming and confusing users.

**Conclusion:** The methods show that practitioner expertise can be reformulated in a format that simultaneously captures SU expertise, to provide a tool highly valued by SUs. A stepped process adds necessary structure to the assessment, each step with its own feedback and guidance.

**Practice Implications:** The GRISt web-based DSS ([www.egrlist.org](http://www.egrlist.org)) links and integrates myGRaCE self-assessments with GRISt practitioner assessments for supporting collaborative and self-managed healthcare.

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## 1. Introduction

Increasing attention is being paid to involving service users (SUs) in their own health care to help them stay living independently in the community. In 2008, the UK-based health foundation established a programme for “co-creating health”, specifically designed to improve collaboration and self-management for SUs with long-term conditions. The programme motivation was that “neither practitioners nor SUs are systematically provided with the support, skills and tools that they need to work effectively in this way” [1]. The programme provided some of

the resources required and a recent evaluation demonstrated their benefits [2], but none of them specifically exploited information technology (IT) targeted on collaboration between SUs and practitioners. This paper describes research into an entirely new type of IT to this effect: the myGRaCE decision support system (DSS) that helps people assess and manage their own mental health and well-being. It is intended for use by the general public with the aim of improving mental health and reducing risks of suicide, self-harm, harm to others, self-neglect, and vulnerability.

Detecting and managing risks associated with mental-health problems help reduce service and societal costs by preventing relapse and untoward incidents [3,4], and helping people return to work [5]. Not enough people have sufficient expertise to recognise or address these risks effectively. Specialist resources are increasingly thinly stretched, so finding ways of disseminating mental health knowledge to those who lack it, but who need it, is an urgent challenge. Our recent systematic review highlighted this

\* Corresponding author.

E-mail addresses: [c.d.buckingham@aston.ac.uk](mailto:c.d.buckingham@aston.ac.uk) (C.D. Buckingham), [a.e.adams@warwick.ac.uk](mailto:a.e.adams@warwick.ac.uk) (A. Adams), [laura.vail@warwick.ac.uk](mailto:laura.vail@warwick.ac.uk) (L. Vail), [kumara4@aston.ac.uk](mailto:kumara4@aston.ac.uk) (A. Kumar), [ahmeda10@aston.ac.uk](mailto:ahmeda10@aston.ac.uk) (A. Ahmed), [anniewhelan@aol.com](mailto:anniewhelan@aol.com) (A. Whelan), [e.karasouli@warwick.ac.uk](mailto:e.karasouli@warwick.ac.uk) (E. Karasouli).

as an important gap in online mental-health self-management resources [6] and the Galatean Risk and Safety Tool, GRiST ([www.egrist.org](http://www.egrist.org)), was developed precisely to fill it. GRiST is the origin for the self-assessment version, myGRaCE, and is briefly introduced to show how it operates within mental health, and how the research methodology enabled myGRaCE to be derived from it.

1.1. The GRiST cognitive model and software functionality

The GRiST DSS encapsulates risk-assessment expertise using cognitive modelling [7], a form of computational psychology where the goal is constructing plausible information-processing metaphors for how people think and reason. It is highly relevant to constructing DSSs because humans remain responsible for decision outcomes, need to understand reasons why one decision is supported over another, and are required to make judgements under uncertainty about each decision’s efficacy [8]. DSS advice must be understood intuitively by decision makers, with trust in its provenance being an important factor in system adoption [9].

GRiST bases its expertise on a psychological model of classification [10]. SUs are classified into risk categories by evaluating their level of category membership: the higher the membership, the higher the risk. Risk categories are represented by knowledge structures called galateas [10] focusing on “perfect” class members (Galatea was Pygmalion’s perfect woman): ones with the highest probability of being in the class and the most memorable. The galatea for each risk is compared with the SU being assessed: the closer the SU profile to the galatea, the higher the risk category membership. This galatean approach to classification resonates with practitioners and SUs alike; they can easily recall individuals with exceptional risk profiles, or themselves when feeling most at risk, to use as benchmarks.

Galateas are hierarchically structured, which enables GRiST to link low-level cues (e.g. realism of a plan to end your life), through higher level concepts (e.g. current intention), to top-level risk categories like suicide. Fig. 1, in the left-hand panel (LHP), shows

how this explains the association between data and risks for suicide (or “ending your own life” in myGRaCE). The hierarchy (or tree) has “current intention to end your life” selected and the associated questions are displayed in the right-hand panel (RHP) where the SU provides answers.

There is plenty of evidence for the psychological validity of hierarchical knowledge structuring. Cohen’s review [11] concluded that it was a fundamental psychological function, recently shown to relate directly to neural processes [12,13]. Grounding GRiST in a psychological model using hierarchical knowledge structures gives it generic relevance to everyone, not just practitioners. Similarly, the knowledge content is not specific to any practitioner discipline, so there are no language barriers dependent on specialist mental-health training. This is a key methodological driver of the research because it makes it easier to develop GRiST versions for different types of user [14,15]. Users can communicate with each other via the same core knowledge base which provides a common risk ‘language’, despite differences in the wording or presentation of their own version of GRiST. It makes the approach ideal for collaborative health care [16] because it clarifies ambiguities about what each party is saying and provides a single reference point for their alternative perspectives.

Although other DSSs rely on expert human judgement for their knowledge base, none before myGRaCE have attempted to convert practitioner expertise into a complementary SU model. This is the innovation of myGRaCE. It enables SUs to exploit their own expertise, in collaboration with practitioners, via web-based software. The idea is for data to be entered into myGRaCE as part of the natural assessment flow, in collaboration with the assessor; myGRaCE supports the assessment process to generate a report jointly created by assessors and SUs that represents their consensus. Alternatively, people can do a self-assessment in their own time at home, which can then be compared with practitioner assessments. GRiST enables this by letting practitioners and SUs link their reports for sharing online. The relationship between myGRaCE and the original GRiST DSS is explained next.

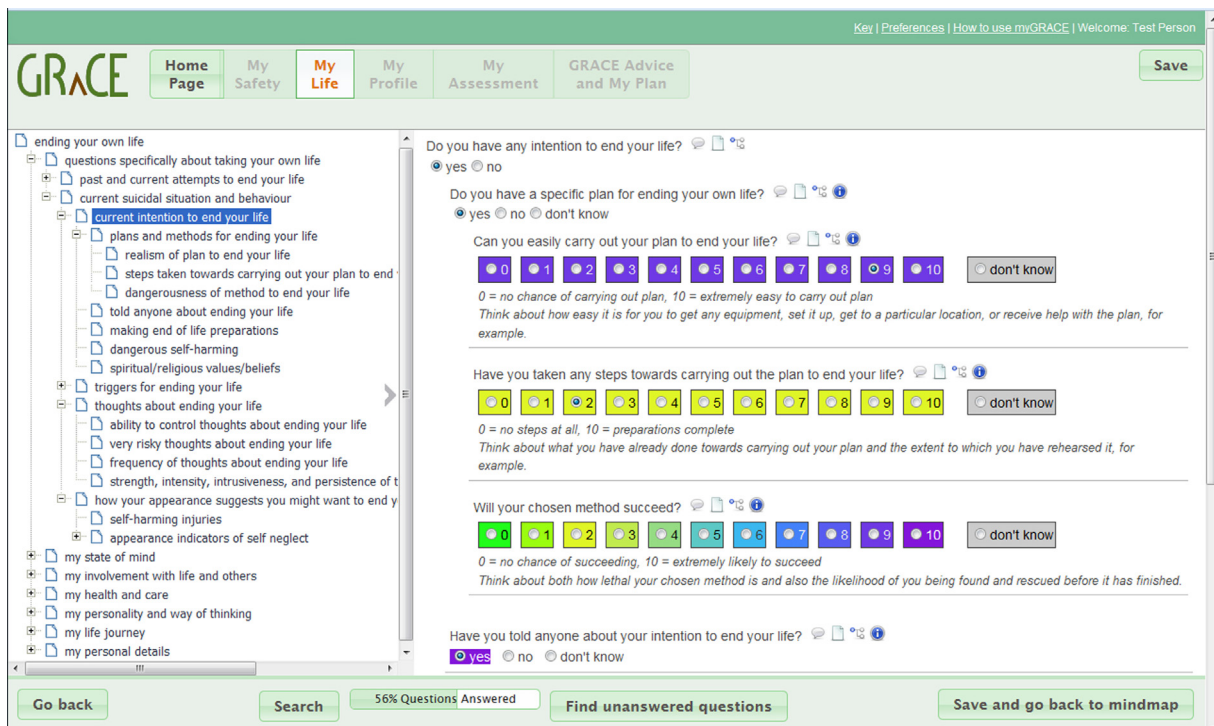


Fig. 1. myGRaCE for self-assessments. The tree structure is shown in the left-hand panel with the selected (highlighted) branch producing the data-collection questions in the right-hand panel.

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