Applying behaviour change theory to understand the barriers to implementing routine outcome monitoring

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Abstract

Background: Routine outcome monitoring (ROM) is a valuable tool for monitoring client progress and pre-empting deterioration, however, there is considerable variation in how data are collected and recorded and uptake in clinical practice remains low. The aim of this study was to develop a self-report measure of practitioner attitudes to ROM in order to better understand the barriers to successful implementation in Child and Adolescent Mental Health Services (CAMHS). **Methods:** An anonymous survey was completed by 184 CAMHS practitioners in the United Kingdom (UK). The survey was designed using the Capability, Opportunity, and Motivation Model of Behaviour (COM-B). Practitioners who reported using ROM frequently in their clinical work (53%) were compared to those who used ROM infrequently (47%) across dimensions of the COM-B survey subscales. **Results:** Confirmatory factor analysis (CFA) confirmed the proposed four-factor structure, showing acceptable model fit, with high factor loadings and good reliability for all subscales. Frequent users of ROM exhibited significantly higher psychological capability, physical opportunity, social opportunity, and motivation, compared to infrequent users $F(4, 140) = 14.76$, $p < .0001$; Pillai's Trace = 0.297, partial $\eta 2 = 0.30$. Results highlight several barriers to ROM, including the belief that there is not a strong evidence base for ROM, not receiving external training, and not discussing feedback and outcome data in supervision. **Implications:** In the hope of improving the successful implementation of ROM, this research provides an evidence-based tool for assessing practitioners' attitudes to ROM, which map on to intervention functions and represent targets for future implementation efforts.

Key words: Child and adolescent mental health services (CAMHS); routine outcome monitoring (ROM); implementation; behaviour change interventions.

Practitioner points

- The value of routine outcome monitoring (ROM) as a means to measure client progress and to elevate the efficiency and quality of mental health care is well-documented in the research literature, however, uptake in practice remains relatively low.
- This study applied behaviour change theory to develop a psychometrically sound self-report measure of practitioners' perspectives and practices to understand the barriers to implementation in child and adolescent mental health services in the UK.
- The complex and multifaceted nature of the barriers to implementation requires multilevel behaviour change strategies at the client, clinician, and organisational level.
- Recommendations for practice include the need for integrated, multilevel strategies aimed at improving practitioners' capabilities and motivations, strong organisational leadership and a culture of data gathering and sharing, and implementation interventions which are tailored to target local barriers.

Introduction

The value of routine outcome monitoring (ROM) as a mechanism for measuring and monitoring client progress as well as for elevating the efficiency and quality of mental health care is well-documented in the research literature (Bickman, Kelley, Breda, de Andrade, et al., 2011; Connors et al., 2020; Delgadillo et al., 2018; Jensen-Doss et al., 2020; Lambert & Harmon, 2018; Shimokawa et al., 2010). ROM is particularly useful for identifying individuals who are not improving and signalling those at greatest risk of deterioration, providing clinicians with the opportunity to detect obstacles to improvement and to adapt treatment accordingly (Delgadillo et al., 2018; Gondek et al., 2016; Lambert & Harmon, 2018). Randomised trials have provided evidence to support routine outcome feedback in producing enhanced treatment outcomes and reducing symptom severity in not-on-track clients (that is, those not responding to treatment) when compared to routine psychological treatment (Brattland et al., 2018; de Jong et al., 2012; Delgadillo et al., 2018; Shimokawa et al., 2010). Moreover, trials have shown that feedback-informed treatment reduces symptoms in a fewer number of sessions and reduces premature dropout (Delgadillo et al., 2017; Janse et al., 2020; Shimokawa et al., 2010). Despite these promising results, systematic reviews and meta-analyses have provided a somewhat varied picture of evidence for ROM in improving outcomes, typically finding modest overall effects (Carlier et al., 2012; Gondek et al., 2016; Kendrick et al., 2016; Lambert et al., 2018; Østergård et al., 2020; Shimokawa et al., 2010).

In this study, ROM is considered within the context of child and adolescent mental health as a set of practices consisting of standardised outcome and feedback questionnaires and tools completed by a child or young person, or by their parent, carer or a professional who works with them, to capture information about that child or young person's emotional wellbeing, symptoms, functioning, or experience of care to monitor progress and to evaluate treatment outcomes. Outcome and feedback monitoring is generally viewed positively by young people attending mental health services (Hall et al., 2014; Moltu et al., 2018; Solstad et al., 2019) but most of what is known about the mechanisms and effectiveness of ROM comes from the adult literature. Existing quantitative studies with youth populations support the utility and effectiveness ROM in improving mental health outcomes (Bickman, Kelley, Breda, De Andrade, et al., 2011; Douglas et al., 2015). However, to date, systematic reviews have provided insufficient evidence to draw definitive conclusions about the effectiveness of ROM in improving outcomes for young people, suggesting the need for additional quantitative research (Bergman et al., 2018; Bickman et al., 2016; Tam & Ronan, 2017).

In addition to assessing treatment progress, the datasets generated from routinely collected data are important for advancing research and informing service improvement (Connors et al., 2020; Lewis et al., 2019). ROM is an important feature of clinical governance and quality assurance and contributes to an organisational culture of transparency and accountability (Jensen-Doss et al., 2020). Both statutory and non-statutory services are increasingly required to demonstrate the effectiveness and value of their service provision to commissioners, funders, and governing bodies. The quantity and quality of outcome data collected by services determines how well researchers can conduct treatment outcome studies and evaluate the effectiveness of treatment provided by CAMHS, which, in turn, contributes to practice-based evidence. This has led to a growing expectation for CAMHS to implement ROM and to systematically measure, monitor and report outcome data.

Despite evidence of utility, the collection and evaluation of routinely collected data continues to be underused in practice and there is considerable variation in how data is collected and recorded (Ionita & Fitzpatrick, 2014; Turchik et al., 2007). There are a number of known barriers to implementation, spanning from individual to systems levels, which is reflected in low practitioner engagement (Boswell et al., 2015; Hamilton & Bickman, 2008; Lewis et al., 2019; Mellor-Clark et al., 2016). Data indicates relatively low uptake within CAMHS, with less than 50% of practitioners routinely gathering outcome data (Batty et al., 2013; Bickman et al., 2000; Hatfield & Ogles, 2004; Ionita & Fitzpatrick, 2014; Jensen-Doss et al., 2018; Johnston & Gowers, 2005; Phelps et al., 1998; Westmacott & Hunsley, 2010). However, it should be noted that this number does appear to be increasing in recent years (Hall et al., 2013). These data suggest challenges to implementation and a research-practice gap that warrants further investigation.

Existing research on barriers to the implementation of ROM has identified time and financial burdens (Batty et al., 2013; Gleacher et al., 2016; Norman et al., 2014; Sharples et al., 2017). Factors including receiving formal training on the use of specific measures, databases and data interpretation (Callaly et al., 2006; Martin et al., 2011; Willis et al., 2009) and organisational culture and climate are also associated with practitioner attitudes and engagement (Aarons & Sawitzky, 2006). It is possible that misconceptions, incomplete knowledge or valid scepticism about outcome measures and their application and limitations pose as obstacles to uptake. The subjective nature of measures, differing psychometric properties, and other methodological constraints can limit the way in which they are understood and used, meaning practitioners may have reservations about the clinical utility and scientific merit of the available measures (Close-Goedjen & Saunders, 2002; Martin et al., 2011; Meehan et al., 2006). Identifying and understanding practitioners' attitudes to outcome and feedback monitoring is important, as more positive attitudes are known to predict usage across contexts (Bjaastad et al., 2019; Jensen-Doss & Hawley, 2010; Lyon et al., 2014).

To date, a limited number of quantitative studies have examined the relationship between ROM implementation barriers and outcomes or sought to develop evidence-based implementation interventions. The development of psychometrically sound tools to measure implementation outcomes has become an increasing priority in recent years (Lewis et al., 2015; Rye et al., 2019). Using tools designed to measure provider attitudes towards routine progress monitoring and feedback, Jensen-Doss and colleagues have provided important insights into the current low rates of engagement and the strong association between attitudes and usage (Jensen-Doss et al., 2018). Behaviour change is needed in order to translate these insights into practice yet much of the existing research lacks an implementation focus or takes a behaviour change approach, making it difficult to understand why implementation succeeds or fails across contexts (Fleming et al., 2018; Lewis et al., 2019; Nilsen, 2015). Despite important research highlighting several barriers to usage, a coherent, theory-driven account of implementation barriers, along with a valid and reliable tool to measure these in a systematic and comprehensive way, is lacking.

To address this, this study investigated CAMHS practitioners' perspectives towards routine outcome and feedback monitoring and the barriers to implementation in practice across dimensions of the Capability, Opportunity, and Motivation Model of Behaviour (COM-B) (Michie et al., 2011). The field of implementation science is progressing towards increased use of theoretical and framework-based approaches, including the COM-B Model, to address implementation challenges (Nilsen, 2015). There is a growing emphasis on the need for more rigorous, theory-driven investigation of barriers to implementation in informing intervention design (Eccles et al., 2005). To this end, the COM-B Model (Michie et al., 2011) represents a useful framework for mapping both operational and attitude-related factors and how they serve as barriers and facilitators to ROM.

The model proposes that interactions between an individual's capability (C), opportunity (O) and motivation (M) are the antecedents of their behaviour (e.g., practitioners' engagement with outcome and feedback monitoring). Each of these three components influences behaviour directly and capability and opportunity can influence behaviour indirectly through motivation (see Figure 1). The capability component refers to an individual's psychological and physical ability to enact the behaviour. Opportunity refers to factors that are not attributable to the individual and encompasses both physical and social opportunity. Motivation refers to the automatic, habitual, and reflective processes and mechanisms that activate or inhibit behaviour. Motivation is categorised into reflective processes, such as evaluations and making plans, and automatic processes involving emotions and impulses.

[Insert Figure 1]

The COM-B sits at the centre of the Behaviour Change Wheel (BCW) - a toolkit for designing behaviour change interventions (Michie et al., 2014). Behavioural targets can be identified as a basis for interventions intended to change behaviour, for example, in implementing new practices or changes to current practice (Atkins et al., 2017). Michie and colleagues describe nine intervention functions and seven policy categories that link to components of the behaviour system (Michie et al., 2011). The COM-B Model has been successfully applied to understand and promote the implementation of evidence-based practice (EBP) in other clinical areas, including to improve midwives' EBP implementation capability (De Leo et al., 2021) and to explore the factors that contribute to the successful implementation of enhanced services in community pharmacies (Hattingh et al., 2020). Using the COM-B model to assess barriers and facilitators to ROM provides a more comprehensive and implementation-driven picture than previous studies, which often target just one of these components. Assessing implementation outcomes using an integrated framework allows for a more systematic assessment and provides a greater degree of systematisation in measuring barriers to implementation.

The current study

The aim of this study was to develop a self-report measure of practitioners' attitudes and practices to ROM in order to better understand the barriers to implementation in CAMHS. A better understanding of current challenges can inform the development of targeted strategies to improve the implementation of ROM in the future. The primary research questions were: (1) How often do mental health practitioners use routine outcome and feedback monitoring as part of their work in CAMHS? (2) Are there differences between the perspectives of practitioners who use ROM frequently and those who do not, according to the dimensions of the COM-B Framework? (3) Does the survey measure the underlying latent factors consistent with the expected COM-B Model structure?

Method

Procedure

An online survey measuring CAMHS practitioners' use of and attitudes toward ROM was developed by the Child Outcomes Research Consortium (CORC). CORC is a learning collaboration, founded in 2002, which includes CAMHS across England, including both statutory and voluntary sector providers. CORC collects and uses evidence to enable more effective child-centred support, services, and systems to improve children and young people's mental health and wellbeing. CORC members gather and share their data, which is then analysed and fed back to them and disseminated more widely via academic channels. At the time of data collection, there were sixty member organisations signed up to CORC.

CORC members (https://www.corc.uk.net/about-corc/who-we-are/corc-members/), were invited to complete the survey as part of ongoing service improvement work, which aimed to inform future evaluation and improve the implementation of ROM. Service managers at participating sites provided staff with a web-link to the survey, which was available on SurveyMonkey (SurveyMonkey.net). Members of staff who provided services for children and young people, managed those that did so, or processed data about such work at each service were eligible to complete the survey. For the purposes of the service evaluation, inclusion criteria were kept purposefully broad. The survey was completed anonymously and did not request identifiable information. The final responses of five statutory and third sector sites were collected between January 2016 and May 2017 and were included in the analysis.

Survey design

The survey comprised 42 items, including categorical, open-ended, and Likert-scale items. Respondents were asked demographic questions, such as gender, professional role, and number of working hours per week. They were also asked questions relating to their outcome monitoring use (e.g., ‘how often do you use outcome and feedback measures as part of your work?’), which was rated on a 4-point Likert scale from ‘none of the time’ to ‘all of the time’. This item was used to categorise frequent and infrequent outcome measure users. Respondents were also asked about the type of measures they used (e.g., standardised tools, symptom tracking measures, goals measures, experience of service measures), who completed the measures (e.g., clinician, self-report, parent, teacher) and the metrics used to interpret the scores (normed comparison data, clinical cut-offs, reliable change).

The main body of survey items related to respondents’ attitudes to ROM and about the services within which they worked. Items were developed using the COM-B Model as the underlying framework. The content was based on the theoretical and empirical literature related to the implementation of ROM, as well as the experiences and learning of mental health services shared at CORC workshops and learning events. Each item mapped onto one of the ‘sources of behaviour’ outlined in the COM-B Model (Michie, et al., 2011). Subscale domains were capability (psychological/ physical), opportunity (social/ physical), and motivation (automatic/ reflective). Items were rated on four- and five-point Likert scales, where higher scale scores indicated more positive attitudes. Scales were scored by averaging items within a scale out of four or five. Further details about the survey development process and scoring instructions are available in supplementary materials.

Respondent characteristics

Five child and adolescent mental health sites opted to complete the survey, with 245 respondents across sites. Approximately one quarter of respondents (*n* = 61) -were non-clinical staff and did not have a clinical role with clients, including receptionists and secretaries, and stated that routine outcome monitoring was not part of their role or within their remit. As these individuals were not expected or permitted to use ROM, they were subsequently excluded from further analyses.

~~(*n* = 61) stated that routine outcome monitoring was not part of their role or within their remit~~ and were~~. subsequently excluded from further analyses. Those excluded were not practitioners and did not have a clinical role, including receptionists and secretaries.~~ The characteristics of respondents are presented in Table 1

[Insert Table 1]

Ethical considerations

This research was conducted using secondary data collected for service evaluation purposes by the Child Outcomes Research Consortium (CORC). In accordance with University College London (UCL) Research Ethics Committee (REC) Guidelines, ‘service evaluation’ is exempt from the requirement for approval by UCL REC. Respondents were briefed that CORC would analyse the feedback to support improvements in the respondents’ service and would also retain the anonymised survey responses to inform future evaluation and improvement activity.

Data analyses

First, we conducted chi-squared tests to assess differences between respondents who used outcome monitoring always or often (frequent users) and those who used outcome monitoring rarely or never (infrequent users) across demographic variables and individual survey items. Where cells had an expected frequency of less than five, Fisher’s Exact Probability test was used. For Likert-scale items, response categorises were collapsed into a smaller number of trichotomous or dichotomous categories (e.g., strongly agree and agree were collapsed into a single agreement category). Collapsing responses categories in this way increased cell counts in the contingency tables and allowed for the measurement of distinct levels of agreement-disagreement between groups. Frequency tables provided between-group comparisons of individual survey item responses across capability, motivation, and opportunity (see supplementary materials). To account for Type 1 error, a Bonferroni correction was applied. In this study, 20 tests were conducted: Bonferroni correction of (α=.05/20) = .003 (rounded).

Next, we conducted confirmatory factor analysis (CFA) to test how well individual survey items, or indicator variables, represented the expected four constructs, or latent variables, of the COM-B Model (psychological capability, social opportunity, physical opportunity, and motivation). CFA was used to assess the fit between the observed data and an a priori conceptualised, theoretically grounded model. The Lavaan package, in RStudio version 1.1.456 was used to conduct the factor analysis. In total, 10% of data points were missing. Exclusion of individuals with missing data can result in unrepresentative samples, thus parameters were estimated with the full information maximum likelihood procedure (FIML) to account for the presence of missing data while allowing the size of the dataset to remain intact (Allison, 2003; Enders & Bandalos, 2001). FIML is the preferred approach to handling missing data as it produces consistent and unbiased parameter estimates and standard errors when data are missing at random (MAR) (Allison, 2003).

The underlying factor structure and model fit were examined using multiple indices, including the comparative fit index (CFI), with a recommended approximate cut-off of > 0.95; the root-mean-square error of approximation (RMSEA), with a recommended approximate cut-off of < 0.06 indicating a good fit and < 0.08 indicating a reasonable fit; Tucker-Lewis index (TLI), with a recommended approximate cut-off of > 0.95; and the standardized root-mean-square residual (SRMR) with a recommended approximate cut-off of < 0.08 (Hu &

Bentler, 1999). In general, if most indices indicate a good fit, then there is probably a good fit to the data. The internal consistency of each subscale of the survey was tested using Cronbach's alpha.

The literature contains a variety of recommendations regarding the appropriate sample size to use for conducting a factor analysis, which are usually presented as a suggested minimum or a minimum ratio of sample size to number of variables (Mundfrom et al., 2005). Considering recommendations for the sample size to variable ratio, Cattell proposed that this ratio should be in the range of 3 to 6 (Cattell, 2012), whereas Gorsuch argued for a minimum ratio of 5 (Gorsuch, 1983). Twenty-four survey items were included in the CFA, with a sample size of n = 184. This means the sample size to variable ratio was 1 to 8, which exceeds the sample size recommendations provided in the literature (Cattell, 2012; Gorsuch, 1983).

Finally, we conducted a multivariate analysis of covariance (MANCOVA) to determine differences between frequent and infrequent ROM users on COM-B subscales after controlling for possible covariates. The rate of missing data on survey items ranged from 1% to 45%, with a mean of 10%. Data were missing for two reasons: one of the sites did not complete two of the survey items and there was a low response rate to the item 'Analysed outcome and feedback data is shared with commissioners / funders in an effective way'. To check the pattern of missing data in each subscale, Little's Missing Completely at Random (MCAR) test was conducted, suggesting that the data were missing completely at random (MCAR) (Little, 1988). Additional details of missing data analyses are available in supplementary materials. To allow for analysis of a complete dataset, missing survey items were imputed for each subscale in turn using the expectation maximization (EM) method.

Prior to analysis, COM-B variables were examined for multivariate outliers, multivariate linearity and normality, multicollinearity, and homogeneity of covariance. One case was removed from the MANCOVA as a multivariate outlier. A Shapiro-Wilk test showed that subscales social opportunity ($W(183) = 0.99$, $p > .05$) and motivation ($W(183) =0.99$, $p > .05$) were normally distributed, whereas psychological capability ($W(183) = 0.95$, $p < .05$) and physical opportunity ($W(183) = 0.97$, $p < .05$) were not. Overall, *F*-tests are robust to violations of normality if the non-normality is caused by skewness rather than by outliers (Glass et al., 1972; Kenny & Judd, 1986).

Results

Of the 184 participants who reported that outcome and feedback monitoring was part of their role, 53% ($n = 98$) reported using ROM 'all of the time' (18%) or 'nearly all of the time' (35%) and were defined as 'frequent users'. The remaining 47% ($n = 86$) used outcome and feedback monitoring 'none of the time' (1%) or 'some of the time' (46%) and were defined as 'infrequent users'. It is important to note that only two respondents reported using outcome monitoring 'none of the time', meaning that most of the infrequent user group was made up of practitioners who used monitoring only 'some of the time'.

There were no significant differences between frequent and infrequent users in terms of gender or working hours. Of interest, frequent users were more likely to spend an average of less than 21 contact hours with clients per week, compared to infrequent users a $\chi^2(1) = 10.78$, $p = 0.001$. In other words, those with more contact hours with clients were less likely to use outcome monitoring. In terms of professional role, nurses and social workers were more likely to be infrequent users compared to managers and clinical leads who were more likely to be frequent users. A detailed description of respondents' self-reported outcome monitoring use, the type of measures used, outcome informants and the metrics used to interpret data is presented are Table 2. The type of outcome measures used most often were standardised tools (e.g., the Strengths and Difficulties Questionnaire, SDQ (Goodman, 1997)), followed by goals measures and symptom tracking measures. Outcomes measures were collected from the perspective of the children and young people and their parents most often.

[Insert Table 2]

Comparisons between frequent and infrequent users based on the COM-B framework

Capability

For respondents' psychological capability, which is the necessary knowledge and skills to enact the behaviour, there was a significant difference between frequent and infrequent users across all survey items. A significantly higher proportion of respondents reported being confident about outcome measure use in the frequent group (83%), compared to the infrequent group (57%), χ^2 (2) = 17.8, $p < .001$. Compared to the infrequent group, frequent users reported that they felt more able to select and introduce measures to help at assessment and to monitor progress; to decide when measures were appropriate to use; and to provide feedback and discuss outcome measure data with service users. Table S2 provides between-group comparisons of the individual item responses which corresponded to the capability (psychological) component of the COM-B Model.

To determine the role of training on outcome measure use, respondents were asked to indicate what type of training they had received, how long ago the training had been, and how helpful they found it to be. Length of time since last training, and receiving any form internal training, did not differ significantly between groups. Interestingly, a significantly higher proportion of those in the frequent outcome measure user group had received external and accredited training compared to those in the infrequent group. Similarly, those in the frequent outcome measure user group were more likely to have found the training they had received helpful (85%), compared to the infrequent user group (56%), χ^2 (1) = 12.7, $p < .001$. Table S3 provides a between-group comparisons of the individual item responses which corresponded to the capability (training) component of the COM-B Model.

Opportunity

For respondents' physical opportunity, which are the physical factors that are external to the individual, ease of access to measures was associated with outcome measure usage. Respondents who found it easy to access outcome and feedback measures in sessions with service users and easy to access the results from previous sessions at the subsequent session were more likely to frequently use outcome measures than those who did not find access easy. Table S4 provides between-group comparisons of the individual item responses which corresponded to the physical opportunity component of the COM-B Model.

Regarding respondents' social opportunity to use ROM, that refers to the social factors which are external to the individual, such as the organisational culture and climate, respondents in the frequent user group reported that they discussed outcome data significantly more than infrequent users across several formats of supervision. Almost half of respondents in the frequent group reported that their organisation displayed information about outcome measurement and shared data with service users in an accessible way, compared to only 16% in the infrequent group, χ^2 (1) = 19.0, $p < .001$. Compared to the infrequent group, more respondents in the frequent user group believed that outcome data was shared and used effectively across a range of contexts. Interestingly, 49% of respondents in the frequent user group believed that staff had a shared vision which included using routine outcome measures to support service improvement, compared to only 16% of the infrequent user group, χ^2 (1) = 16.5, $p < .001$. Table S5 provides between-group comparisons of the individual item responses which corresponded to the social opportunity component of the COM-B Model.

Motivation

In terms of respondents' motivation, which is the automatic, habitual, and reflective processes that activate or inhibit behaviour, there were significant differences across all items. It is interesting to note that only 40% of infrequent users endorsed the belief that service users were happy to complete measures, compared to 70% of frequent users. Compared to infrequent users, frequent users had more positive motivations and found outcome measures more helpful when planning support (95% vs 67%), more helpful when deciding on a different approach (72% vs 37%), agreed that measures did not take a long time to complete (53% vs 24%), that measures supported shared decision making (89% vs 44%), captured information which was helpful and relevant to service users (82% vs 47%), improved engagement and motivated service users (65% vs 27%) and believed there was a strong evidence base for outcome and feedback measures (77% vs 44%). Table S6 provides between-group comparisons of the individual item responses which corresponded to the motivation component of the COM-B Model.

Factor structure of survey

The specification of the model was based on the original structure of the psychological capability, physical opportunity, social opportunity, and motivation components of the COM-B Framework. The final model consisted of 24 items across 4 factors and showed reasonable model fit (RMSEA = 0.067, 95% CI 0.057 – 0.077, $p < .001$ CFI = 0.91, TLI = 0.9, SRMR = 0.063). Table 3 contains the mean scores and the factor loadings for each of the items. Factor loadings were all above the required threshold of 0.40 (Ford et al., 1986), ranging from .50 to .87. All scales showed acceptable internal consistency: psychological capability (6 items, $\alpha = .88$), physical opportunity (3 items, $\alpha = .71$), social opportunity (5 items, $\alpha = .85$) and motivation (10 items, $\alpha = .87$).

[Insert Table 3]

The MANCOVA showed a statistically significant difference in subscale scores based on outcome measure usage after controlling for contact hours with clients per week, F (4, 140) = 14.76, $p < .0001$; Pillai's Trace = 0.297, partial $\eta 2 = 0.30$. Post-hoc analyses showed that group membership had a statistically significant effect on psychological capability (F (1,143) = 25.86; $p < .001$; partial $\eta 2 = 0.15$), physical opportunity (F (1,143) = 27.57; $p < .001$; partial $\eta 2 = 0.16$), social opportunity (F (1,143) = 16.66; $p < .001$; partial $\eta 2 = 0.10$), and motivation (F (1,143) = 43.18; $p < .001$; partial $\eta 2 = 0.23$), as shown in Table 4.

[Insert Table 4]

Discussion

Summary of findings

The aim of this study was to provide a behaviour change-driven account of current practices and challenges surrounding the implementation of routine outcome monitoring (ROM) in UK CAMHS settings. This was achieved by comparing the perspectives of ~~184~~ CAMHS practitioners who used outcome measures frequently (*n* = 98) to those who used them infrequently (*n* = 86), according to the theoretically derived dimensions of the COM-B Model. A key finding of this study was that 53% of respondents frequently used ROM in practice, either all of the time (18%) or nearly all the time (35%). Encouragingly, only 1% of those with clinical responsibilities reported that they never used ROM, meaning most respondents were using some form of outcome monitoring in practice. Rates of usage within this study were somewhat higher than recent reports in the United States (Jensen-Doss et al., 2018), yet largely consistent with reports from Norway (Bjaastad et al., 2019) and previous figures from the ~~United Kingdom~~UK (Hall et al., 2013), suggesting that the implementation of ROM ~~is largely dependent on the~~remains consistently low across contexts and services.

In line with previous research, practitioners' perspectives and attitudes to ROM were associated with the frequency of usage (Bjaastad et al., 2019; Rye et al., 2019). Compared to infrequent users, practitioners in the current study who used ROM frequently had higher levels of knowledge and skill, reporting that they were more confident about how to use measures as part of their work, more able to select measures to help at assessment and monitor progress, decide when outcome and feedback measures were appropriate to use and to provide feedback to service~~s~~ users about their outcomes. Of interest, receiving external training that was perceived as helpful, across all training types, appeared to be particularly important to usage, whereas internal training did not. Length of time since most recent training did not differ between groups, suggesting that training has an enduring positive effect on future usage. These findings are consistent with previous research, where training, ongoing support, and educational credits have been shown to facilitate greater reported use of outcome monitoring (Edbrooke-Childs et al., 2016; Persons et al., 2016; Rye et al., 2019).

It has been highlighted by others that the implementation of ROM does not occur in a vacuum and challenges must be considered through the lens of organisational and leadership structures (Gleacher et al., 2016; Lambert & Harmon, 2018). This study has provided important insights into the importance of organisational culture and processes in the frequency of staff outcome monitoring. Having the opportunity to discuss outcome data in supervision and with the young people was an important distinguishing factor between usage groups. Only 16% of infrequent users reported that their organisation displayed information about outcome data and was shared with service users in an accessible way, compared to 47% of frequent users. Similarly, frequent users were more likely to work in organisations where staff had a shared vision and data were shared with staff, commissioners, and funders in an effective way, and used to effectively shape service improvement. On a practical level, having easy access to measures during sessions and having access to the results of previous sessions were both significant factors in higher usage, whereas being able to easily input outcome and feedback data onto a central system or database did not appear to be as important. It should be noted that, although barriers to usage were higher in the infrequent group, practical and organisational barriers were generally high across the board. For example, the majority of respondents did not agree that outcome and feedback data was shared with staff in an effective way or used effectively to shape service improvement.

The distinction between the practical barriers described above and philosophical, attitudinal barriers to ROM have been previously described by others (Boswell et al., 2015; Hatfield & Ogles, 2004). The difference in practitioner attitudes between user groups was particularly salient for automatic and reflective motivations (that is, the internal processes which influence decision making and behaviours). This suggests that factors such as practitioners' perceptions about the usefulness of outcome measures, the perception that service users are happy to complete outcome measures, and that there is a strong evidence base for outcome measures, all play an important role in influencing whether a practitioner is frequently using outcome monitoring or not. The results described here highlight that multilevel and targeted interventions are needed to address this and for successful implementation to be achieved.

Implications for research and practice

This study provides useful information about the psychological, organisational, and practical factors that influence ROM in practice, which can inform future implementation efforts and behaviour change interventions. However, successful implementation is not straightforward and requires multilevel strategies and interventions at the client, clinician, and organisational level (Boswell et al., 2015; Lewis et al., 2019; Trauer et al., 2006). The complex and multifaceted nature of the barriers to implementation described in this study will be hard to overcome with discrete or unilateral implementation strategies (Lewis et al., 2019). The COM-B Model and the Behaviour Change Wheel (BCW) represent useful tools to approach this complex implementation challenge. To do so, both perceived capabilities and opportunities must be modified, which can then influence a person's motivation to engage in ROM. In the hope of shaping positive future directions, it is suggested that the barriers outlined above are mapped onto the intervention functions outlined by the COM-B Model to inform behaviour change implementation strategies (Michie et al., 2014).

Our data suggest that there are several factors that are likely drivers of more frequent ROM and should thus be addressed as key targets of implementation efforts. These drivers are:

1) **Practitioner knowledge, skill and confidence** in the selection and use of outcome measures in clinical practice. Introducing, interpreting, and discussing outcome data is a skill that takes time to develop and to do with confidence. It is suggested that training is offered to staff as part of their regular training and professional development programme, along with booster sessions when required. In line with the concept of deliberate practice, training is particularly useful when tailored to individual staff members and their skill level, so that they have the opportunity to engage in active reflection and practice regarding new and emerging skills (Wolpert et al., 2017).
2) **Easy access to measures and results during sessions.** Services should ensure that practitioners have straightforward access to measures during sessions and can access results with ease. It is important that the process of collecting and inputting data is as minimally disruptive to clinicians' routine practice as possible (Boswell et al., 2015).
3) **Discussing outcome and feedback data in individual and group supervision**. It is important to review ROM during both managerial and clinical supervision discussions. This provides the opportunity to check how consistently ROM is happening in practice and provides the opportunity to address barriers to implementation while maintaining them as a high priority. Talking through the routinely collected data will also help with case management, identifying where support needs to change and in planning next

steps. Group and peer supervision can also support group learning and ensure that all staff feel adequately supported (Douglas et al., 2016).

4) **Strong leadership, shared staff vision and an organisational culture of sharing and displaying outcome data.** It is important that outcome data is shared with staff and service users in an accessible way. It is also recommended that data is shared with commissioners and funders in a useful way to ensure that data can effectively shape service improvement. The meaningful collection and use of outcome data requires senior organisational vision and support. Gleacher and colleagues have previously recommended the active engagement of senior leadership through immediate oversight, support, setting expectations, clinical supervision and technical support (Gleacher et al., 2016).
5) **Practitioners' perceived usefulness of outcome monitoring**. The extent to which staff view ROM as a priority and meaningful will impact uptake (Mackrill & Sørensen, 2020). Any future implementation efforts should aim to increase knowledge and understanding by providing information about the evidence base and usefulness of ROM in clinical practice and as a tool for tracking progress. Any future behaviour change interventions should encourage clinicians that ROM can inform and enrich, rather than restrict, treatment (Lambert & Harmon, 2018).

Limitations

Despite the strengths of this study, there are several limitations that reduce the generalisability of findings to other contexts. This study recruited a sample of CAMH services who had already demonstrated that they were particularly engaged in outcome and feedback monitoring and service improvement strategies as existing CORC members. Moreover, practitioners who then chose to respond to the invitation to complete the survey about ROM likely represent a group who are particularly engaged within their respective service. It is likely that differences exist between responders and non-responders, therefore, the sample in this study is likely not representative of all CAMHS practitioners, but rather a subsample of those who are most interested or engaged in the area of ROM. Given that this was a non-compulsory and anonymous survey that was sent to several sites, it was not possible to compare responders to non-responders. It is important to note that only two respondents reported that they used outcome measures none of the time and future research should endeavour to recruit CAMHS practitioners who do not use ROM at all to assess the barriers to usage in this group.

A further limitation is that this study relied on self-reported use of ROM. It is likely that results are subject to response bias, whereby respondents over-report their use of ROM in practice. It is suggested that future research should employ more objective measures of ROM, such as using electronic medical records. It was not within the scope of this study to explore the implementation challenges specific to different sub-services and specialities; however, it is acknowledged that CAMHS is an umbrella term for many different types of services which limits the specificity of the findings and subsequent implications. It is of note that the internal consistency of the physical opportunity subscale was lower than for other domains, indicating a weaker correlation between subscale items. It is suggested that future research aims to establish if the Cronbach's alpha score for physical opportunity is replicated or if items within the subscale are candidates for removal. Finally, given the cross-sectional design of this research, the direction of the relationship between the practitioners' perspectives and outcome measure use cannot be determined. Future research may wish to implement the behaviour change implementation strategies provided in this study and measure changes in perspectives and objective ROM usage.

Implementation evaluation research of this kind would go some way towards delineating the directionality of this relationship.

Conclusions

ROM is a valuable tool for monitoring client progress and pre-empting deterioration, however, uptake in CAMHS has remained low. Despite important research highlighting several barriers to usage, a theoretically driven account of implementation barriers, along with a valid and reliable tool to measure these in a systematic and comprehensive way has been lacking. This study sought to address this challenge by applying behaviour change theory to develop a self-report measure of practitioners' attitudes and practices to better understand the barriers to implementation in UK CAMH services. The survey was deemed as a psychometrically sound tool for assessing context-specific barriers to implementation, lending support for role of COM-B Model components as antecedents of ROM. This tool can be used going forward to provide the basis for new research and interventions aiming to assess barriers to implementation and to promote ROM in CAMHS. Recommendations for practice emphasise the need for integrated multilevel strategies aimed at improving practitioners' capabilities and motivations, strong organisational leadership and a culture of data gathering and sharing, and interventions that are tailored to target local barriers. It important to understand the barriers and challenges surrounding the use of outcome monitoring at a local level if data gathering and reporting is to be improved and successful implementation is to be achieved.

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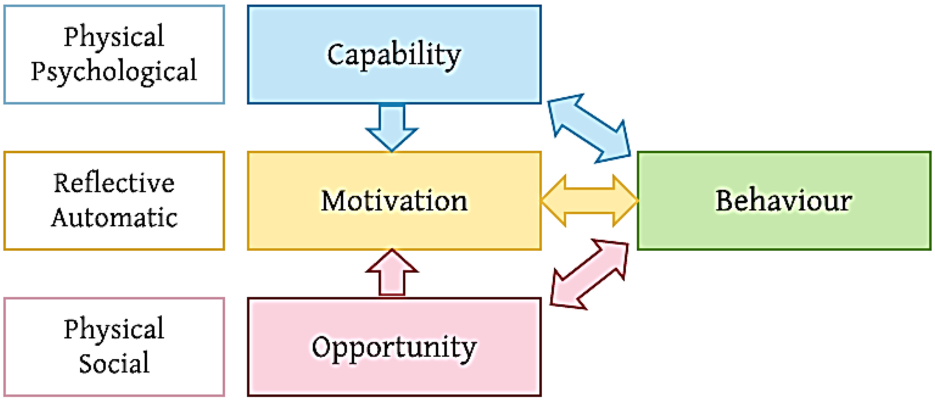

Figure 1. COMB-B Model adapted from (Michie et al., 2011)

Table 1. Respondent characteristics

Respondent characteristics (*n* = 184)	Infrequent users (*n* = 86)	Frequent users (*n* = 98)
Gender, Female *n* (%)	51 (59.3)	63 (64.3)
Professional role, *n* (%)		
Clinician/practitioner/ therapist	68 (79.1)	75 (76.5)
Nurse	11 (12.8)	2 (2.0)
Allied health professional (e.g., social worker)	3 (3.5)	0 (0)
Administrator/ secretary/ receptionist	2 (2.3)	0 (0)
Manager/ clinical lead	1 (1.2)	9 (9.2)
Other (e.g., youth worker)	1 (1.2)	4 (4.1)
Working hours, *n* (%)		
Full-time	41 (47.7)	44 (44.9)
Part-time	22 (25.6)	35 (35.7)
Contact hours per week, *n* (%)		
< 21 hours	41 (47.7)	70 (71.4)
> 21 hours	24 (27.9)	11 (11.2)

Table 2. Practitioners’ use of routine outcome measurement in practice

Survey item	Infrequent users (*n* = 86)	Frequent users (*n* = 98)
Do you use the following?		
Any standardised tool (e.g., SDQ, ORS / CORS), *n* (%)		
Never	5 (5.8)	1 (1.0)
Sometimes/ Often	80 (93.0)	95 (96.9)
A symptom tracking measure (e.g., RCADS sub-scales), *n* (%)		
Never	10 (11.6)	4 (4.1)
Sometimes/ Often	71 (82.6)	88 (89.8)
A goals measure (e.g., Goal Based Outcomes), *n* (%)		
Never	17 (19.8)	3 (3.1)
Sometimes/ Often	64 (74.4)	93 (94.9)
An experience of service measure (e.g., CHI-ESQ), *n* (%)		
Never	18 (20.9)	12 (12.2)
Sometimes/ Often	59 (68.6)	80 (81.6)
A locally developed/ bespoke measure, *n* (%)		
Never	24 (27.9)	24 (24.5)
Sometimes/ Often	16 (18.6)	26 (26.5)

Do you use outcome and feedback measures which collect data about children and young people from:		
The children and young people themselves, yes *n* (%)	82 (95.3)	93 (94.9)
Parents, yes *n* (%)	79 (91.9)	91 (92.9)
Teachers, yes *n* (%)	40 (46.5)	49 (50.0)
Clinician/ practitioner, yes *n* (%)	32 (37.2)	38 (38.8)
Do you use the following concepts in your work:		
Normed comparison data		
Never	25 (29.1)	17 (17.3)
Occasionally/ Often	25 (29.1)	49 (50.0)
Clinical cut-offs		
Never	27 (31.4)	15 (1.3)
Occasionally/ Often	25 (29.1)	50 (51.0)
Reliable change		
Never	35 (40.7)	18 (18.4)
Occasionally/ Often	17 (19.8)	45 (45.9)

SDQ, Strengths and Difficulties Questionnaire; ORS, Outcome Rating Scale; CORS, Child Outcome Rating Scale; RCADS, Revised Children's Anxiety and Depression Scale; CHI-ESQ, Commission for Health Improvement-Experience of Service Questionnaire

Table 3. Item scores and CFA loadings

Scale or item	Mean ± sd	β Unstandardised	B Standardised	SE
Psychological capability *(1 not at all well to 4 very well)*				
How well do you feel able to select outcome and feedback measures to help at assessment or to monitor progress?	3.31 ± 0.61	0.54	0.87	0.04
How well do you feel able to introduce and use outcome and feedback measures to help at assessment or in monitoring progress?	3.34 ± 0.63	0.54	0.86	0.04
How well do you feel able to decide when outcome and feedback measures are appropriate to use and when they are not?	3.34 ± 0.69	0.57	0.83	0.04
How well do you feel able to choose outcome and feedback measures jointly with service users where appropriate?	3.09 ± 0.80	0.54	0.67	0.06
How well do you feel able to provide feedback to services users and discuss with them the data from outcome and feedback measures?	3.22 ± 0.73	0.61	0.82	0.05
I am confident about how to use outcome and feedback measures as part of my work *(1 strongly disagree to 5 strongly agree)*	3.77 ± 0.94	0.63	0.64	0.07
Physical opportunity *(1 not easy at all easy to 4 very easy)*				
How easy is it to access outcome and feedback measures in sessions with service users?	2.89 ± 0.86	0.66	0.77	0.06
How easy is it to access the results from previous sessions at the subsequent sessions?	2.60 ± 0.91	0.72	0.80	0.06
How easy is it to input outcomes and feedback data onto a central system or database within your organisation?	2.56 ± 0.99	0.62	0.63	0.09
Social opportunity *(1 strongly disagree to 5 strongly agree)*				

Analysed outcome and feedback data is shared with staff in an effective way	2.6 ± 1.07	0.76	0.71	0.07
Outcome and feedback data is used effectively to shape service improvement	3.01 ± 1.09	0.95	0.89	0.07
Analysed outcome and feedback data is shared with commissioners / funders in an effective way	3.32 ± 1.03	0.88	0.79	0.08
Staff have a shared vision which includes using routine outcome measurement to support service improvement	3.08 ± 1.05	0.87	0.87	0.07
Staff in this service are committed to using outcome and feedback measures where appropriate	3.58 ± 0.89	0.69	0.69	0.07
Motivation *(1 strongly disagree to 5 strongly agree)*				
I find outcome and feedback measures useful	3.97 ± 0.72	0.59	0.82	0.05
Outcome and feedback measures help in planning treatment and support	3.98 ± 0.65	0.52	0.80	0.04
Service users are happy to complete outcome and feedback measures	3.53 ± 0.81	0.48	0.59	0.06
Outcome and feedback measures help me decide when a different approach or professional is needed	3.56 ± 0.90	0.60	0.67	0.06
Outcome and feedback measures do not take a long time to complete	3.06 ± 1.04	0.56	0.54	0.08
Outcome and feedback measures support shared decision making	3.77 ± 0.78	0.60	0.78	0.05
Outcome and feedback measures capture information which is relevant and helps service users	3.71 ± 0.86	0.78	0.67	0.06
Outcome and feedback measures improve engagement and motivate service users	3.43 ± 0.81	0.55	0.68	0.06
I avoid using outcome and feedback measures[a]	3.87 ± 1.02	0.51	0.50	0.08
There is a strong evidence base for outcome and feedback measures	3.78 ± 0.82	0.52	0.63	0.06

[a]Reverse coded item

Table 4. Comparison of mean subscale scores between frequent and infrequent ROM users

Survey subscale	Total sample	Infrequent users (*n* = 86)	Frequent users (*n* = 98)	Mean difference	MANCOVA
	Mean ± sd	Mean ± sd	Mean ± sd		
Psychological capability	3.34 ± 0.59	3.07 ± 0.59	3.58 ± 0.48	0.51	F = 27.57; partial η^2 = .16**
Physical opportunity	2.68 ± 0.73	2.37 ± 0.64	2.95 ± 0.69	0.58	F = 25.86; partial η^2 = .15**
Social opportunity	3.01 ± 0.82	2.78 ± 0.76	3.33 ± 0.79	0.55	F = 16.66; partial η^2 = .10**
Motivation	3.66 ± 0.58	3.35 ± 0.56	3.93 ± 0.45	0.58	F = 43.18; partial η^2 = .23**

***p** < .05. ****p** < .001