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ORIGINAL ARTICLE

A national evaluation of a multi-modal, blended, digital intervention integrated within Australian youth mental health services

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Abstract

Background: Youth mental health (YMH) services have been established internationally to provide timely, age-appropriate, mental health treatment and improve long-term outcomes. However, YMH services face challenges including long waiting times, limited continuity of care, and time-bound support. To bridge this gap, MOST was developed as a scalable, blended, multimodal digital platform integrating real-time and asynchronous clinician-delivered counselling; interactive psychotherapeutic content; vocational support; peer support, and a youth-focused online community. The implementation of MOST within Australian YMH services has been publicly funded.

Objective: The primary aim of this study was to evaluate the real-world engagement, outcomes, and experience of MOST during the first 32 months of implementation.

Method: Young people from participating YMH services were referred into MOST. Engagement metrics were derived from platform usage. Symptom and satisfaction measures were collected at baseline, 6, and 12 (primary endpoint) weeks. Effect sizes were calculated for the primary outcomes of depression and anxiety and secondary outcomes of psychological distress and wellbeing.

Results: Five thousand seven hundred and two young people from 262 clinics signed up and used MOST at least once. Young people had an average of 19 login sessions totalling 129 min over the first 12 weeks of use, with 71.7% using MOST for at least 14 days, 40.1% for 12 weeks, and 18.8% for 24 weeks. There was a statistically significant, moderate improvement in depression and

anxiety at 12 weeks as measured by the PHQ4 across all users irrespective of treatment stage ($d = 0.41$, 95% CI 0.35–0.46). Satisfaction levels were high, with 93% recommending MOST to a friend. One thousand one hundred and eighteen young people provided written feedback, of which 68% was positive and 31% suggested improvement.

Conclusions: MOST is a highly promising blended digital intervention with potential to address the limitations and enhance the impact of YMH services.

KEYWORDS

blended interventions, digital mental health, implementation, internet treatment, youth mental health

1 | INTRODUCTION

Youth mental health (YMH) remains a pressing global health challenge, with mental ill-health being the leading cause of disability worldwide.[1] Importantly, 75% of these disorders manifest before age 25, leading to disruptions in important developmental milestones of young adulthood,[2] with life-long consequences.[3] Worryingly, the already high prevalence of mental ill-health among young people appears to be escalating. Recent data from Australia revealed that 38.8% of young people aged 16–24 experienced a diagnosable mental illness in the previous 12-months,[4] a 50% increase from a decade ago, with similar trends reported internationally.[5] In response, YMH services have been established internationally to deliver timely, age-appropriate interventions that avert the development of long-term disability.[6] However, services encounter multifaceted challenges including long waiting times,[7] low engagement levels and the provision of time-limited support.[8] In addition to these service challenges, evidence suggests that between one and two thirds of young people receiving established interventions do not experience meaningful symptom reduction.[9] Service limitations are also exacerbated by a shortage of qualified mental health practitioners and political and fiscal constraints that impede the expansion of service provision.[10]

Digital mental health interventions (DMHI) have the potential to address service limitations and improve access to effective and sustainable care. Nearly 30 years of internet-delivered treatment research and service delivery, primarily with adults, has demonstrated that DMHI are efficacious and significantly improve accessibility.[11–13] Indeed, in Australia, 9% of the population accessed a digital mental health service in the preceding year.[4] Regarding young people, a recent narrative review of 41 studies and meta-analysis of 15 studies of DMHI targeting depression and anxiety showed these were effective compared to no treatment, with a small

Significant outcomes

- MOST, a multicomponent blended digital platform, demonstrated significant, moderate improvements in depression and anxiety symptoms among young people, and larger improvement among those waiting for care, indicating its effectiveness as a mental health intervention.
- The platform achieved high engagement, with a majority of users actively participating for extended periods and expressing high levels of satisfaction, evidenced by 93% recommending MOST to a friend.
- Feedback from users highlighted MOST's potential to overcome challenges faced by traditional Youth Mental Health services, including long waiting times and limited continuity of care, suggesting its viability as a scalable solution to enhance mental health support for young people.

Limitations

- The study's uncontrolled design limits the ability to draw causal inferences about MOST's effectiveness, highlighting the need for controlled trials to validate its impact.
- With over half of participants not completing follow-up assessments, evaluation results may introduce positive bias, questioning the representativeness of the outcome data.
- The inability to assess the effectiveness of individual components within the multimodal MOST platform restricts understanding of which aspects contribute most to its overall effectiveness.

treatment effect (Cohen's $d = 0.33$, 95% CI 0.11–0.55), and that the provision of additional human clinical support enhanced their effectiveness compared to no treatment (Cohen's $d = 0.52$, 95% CI 0.23–0.80).[14]

Despite their potential for addressing service shortcomings, very few DMHI have been successfully implemented within mental health services.[15,16] This failure in implementation is three-fold. First, most DMHI have been designed in academic or commercial settings, in isolation from clinical services, thereby failing to consider service constraints and needs.[17] For example, one of the largest implementation studies to date, evaluated two of the world's best self-directed CBT-based DMHI (MoodGym and Beating the Blues), coupled with weekly coach support, against treatment as usual. The study found no significant benefits and limited engagement.[18] Second, efficacy trials have typically consisted of population-based studies recruiting a small proportion of highly motivated individuals from large pools of potential participants that lack generalisability into clinical settings.[17] Finally, engagement poses a significant challenge in DMHI.[15,16] Research indicates that younger cohorts demonstrate higher attrition and lower engagement rates,[15,16] undermining the potential for DMHI to achieve lasting effects when integrated with clinical service.[14,19]

Moderated Online Social Therapy (MOST: http://www.most.org.au) is a service integrated DMHI, purpose-built to address YMH service limitations. Co-designed with young people, clinicians and services, MOST was developed to deliver integrated and complementary digital mental health support for young people at different phases of their care journey within traditional services: while waiting for face-to-face care, while in face-to-face care, and following discharge.[20]

Originally designed to sustain treatment benefits, improve vocational recovery and prevent relapse following discharge from specialised first episode psychosis services,[21] MOST has been iteratively evaluated and adapted in 21 Phase I–III trials in a wide range of conditions, including psychosis,[21] ultra-high risk for psychosis,[22] bipolar disorder,[23] borderline personality disorder,[24] depression,[25] anxiety and social anxiety,[26–28] vocational recovery,[29] and suicide risk,[30] across all stages of treatment (i.e., help-seeking,[26] blended with face-to-face care,[31] relapse prevention[21]). Results from these trials showed that MOST was acceptable, engaging, safe, effective and cost-effective.[32] Supported by this evidence, in September 2020 MOST was launched across all YMH services in Victoria, Australia. Since then, MOST's government funded implementation has expanded to include Queensland, New South Wales, and the Australian Capital Territory, broadening its reach across Australia.

The primary aim of this study was to provide a real-world evaluation of the initial 32 months following the publicly funded implementation of MOST across four Australian states and territories. MOST evaluation was guided by the RE-AIM framework.[33] This paper reports on MOST engagement, clinical outcomes, and satisfaction. The implementation strategy and outcomes will be reported elsewhere.

2 | MATERIALS AND METHODS

2.1 | Design, participants and setting

This study comprises a real-world evaluation of MOST, which was implemented into a network of 93 YMH services, comprising 262 clinics, across four Australian states and territories between 27 October 2020 and 30 June 2023. Young people 12–25 were referred to MOST by YMH services and had no current acute suicidal risk requiring immediate support or acute mental disorder (i.e., acute psychotic symptoms). As part of the registration, young people agreed to the Terms of Use, which explained that non-identifiable, aggregated data could be used for reporting and service evaluation purposes. Young people could opt-out of their data being used for service evaluation. Ethical approval for the use of the data was obtained from the Royal Melbourne Hospital Human Research Ethics Committee (HREC/83853/MH-2022).

2.2 | MOST digital intervention and service model

The MOST service and platform was co-designed with clinicians, researchers and young people from diverse backgrounds over a period of 12 years, and is comprised of five integrated support components[20]: (1) interactive psychotherapeutic content; (2) mental health clinicians; (3) peer workers; (4) vocational workers; and (5) a moderated youth-specific social network. The service model adapts to young people across phases of care (i.e., while waiting for face-to-face care, while receiving face-to-face care, or following discharge).

Young people can be referred to MOST by any YMH service clinician or administrative staff member at any point in their contact with the service (i.e., waiting or care, in face-to-face care, at discharge). On referral, young people receive a personalised invite link to MOST via SMS. After signing up and completing a brief assessment of current symptoms and difficulties, young people are recommended a guided therapy journey (further information below) and invited to post on the social network. They are also encouraged to attend a welcome call with a clinician and also given the option of connecting with a peer worker and/or vocational worker.

2.2.1 | Psychotherapeutic content

MOST's psychotherapeutic content is evidence-based, derived from cognitive behavioural therapies. Young people are recommended one of six 'journeys' based on their onboarding assessment responses: Improve Your Mood (Depression), Finding Your Calm (Anxiety), Improve Your Sleep (Sleep), Improve Your Confidence (Social Anxiety), and Social Hacks (Social Skills). Separate developmentally appropriate content is available for 12–14-year-olds. Young people are encouraged to complete their journey with support from a clinician but can complete on their own. Young people can also access discrete activities via an '*explore*' function and are prompted to save any helpful activities to their personalised therapy '*toolkit*' for later reference. Table A1 provides more detail about the content on MOST.

2.2.2 | Mental health clinicians

Clinicians on MOST are fully credentialled mental health professionals and use standardised treatment manuals aligned to the MOST psychotherapeutic content. All young people aged 12–14 years are automatically assigned a clinician following sign-up. Those aged 15–25 years are encouraged to take up clinician support. Clinician support is offered over a 12-week allocation period and includes scheduled contacts, including an initial phone call, then predominately asynchronous and text-based interactions. Where a young person is receiving concurrent face-to-face care, a shared care approach is taken. On demand support is also available. Apart from scheduled contacts if engaging with clinical support, MOST does not include reminder messages or notifications. The time spent messaging clinicians and other professional supporters on MOST (and not phone calls) counted towards the total time spent on MOST.

2.2.3 | Peer workers

Peer workers are young people with lived and/or living experience of mental ill-health. They are paid employees who undertake training to deliver peer support within an intentional peer support framework.[34] Peer workers moderate the social network, maintaining a vibrant and supportive culture, responding constructively to posts, and sharing resources and discussion starters. They also offer one-to-one support via messaging, which young people can access at any time.

2.2.4 | Vocational workers

Vocational workers on MOST are tertiary-qualified career specialists with experience supporting young people whose education or career path has been affected by mental ill-health. They provide one-to-one messaging support for young people on MOST to navigate career decisions and achieve their work and study goals.

2.2.5 | Moderated youth social network

MOST provides a moderated space for young people to connect with other young people with similar experiences, developed to address self-stigma and loneliness, and to foster hope and agency for young people as they navigate treatment. Peer connection is facilitated via "talking points", which are topic-based discussions embedded within the psychotherapeutic content; a "community feed" which allows for general sharing of experiences, resources, and support; and a "talk it out" function which guides young people to share and collaboratively address problems, following principles and techniques from an evidence-based social problem solving framework.[35]

2.3 | Measures

2.3.1 | Platform and service use

Overall use was measured by minutes spent on MOST and the number of unique sessions (logins). The total number and proportion of users who were active on the platform (any session, page view or action) at given timepoints: Day 0, Day 1, Day 14, Day 30, Day 42 (Week 6), Day 84 (Week 12), Day 168 (Week 24) was also measured. Given that MOST is a multicomponent, flexible intervention, the magnitude of component use is reported only for those who used the component at least once. Social network use was measured by the number of reactions, comments and posts, and the combination of these. Clinical, peer and vocational team interactions were measured by the number of messages sent and received. The amount of psychotherapeutic content use was measured by the number of unique 'therapy items' viewed by the young person.

2.3.2 | Clinical outcomes and satisfaction measures

Outcome and satisfaction questionaries were administered at baseline and 6 and 12 weeks (primary endpoint) via mobile phone delivered automated online surveys. The primary outcome was combined anxiety and depression as measured by the Patient Health Questionnaire-4 (PHQ4). The PHQ-4 is an ultra-brief tool for detecting

anxiety and depression,[36] and is made up of combination of the PHQ-2[37] and the GAD-2.[38] The PHQ4 has been shown to be reliable, valid and sensitive to change.[39] Secondary outcomes included general psychological distress as measured by the Kessler 10-Item Scale (K-10)[40] and psychological wellbeing as measured by the Short Warwick-Edinburgh Mental Wellbeing Scale (SWEMWBS).[41]

The 9-item satisfaction questionnaire administered at 6 and 12 weeks contained questions on a 5-point Likert scale (Table 4) as well as an option for open text feedback, allowing for satisfaction to be assessed through mixed methods.

2.4 | Statistical analyses

Descriptive analyses of demographics, baseline symptoms, service preferences and engagement were performed for those who onboarded onto MOST and used it at least once. Generalised estimating equation (GEE) models, with time as a fixed effect and user as a random effect, were used to examine changes in outcome measures from assessment to post-treatment.[42] An autoregressive correlation structure was also used. Consistent with the principles of intention-to-treat analyses, all users who provided baseline data for core outcome measures were included in the analyses. Multiple imputation, with the iterative-chained-equation method was used to compute missing data (Figure 1).[43]

Consistent with previous evaluations of YMH services and Australian Public Mental Health services clinical change was calculated in two ways: within-group Cohens' *d* effect sizes based on the estimated marginal means derived from GEE modelling and individual clinical improvement or clinical deterioration classification determined by effect size changes of >0.5 (improvement) and <−0.5 (deterioration).[44,45] Data were analysed using RX. Thematic analysis following Braun and Clarke's method[46] was conducted to identify recurring patterns in user feedback, focusing on young people's affective experiences of the platform and its features. After becoming familiar with the data, a deductive coding framework was established, cross-referencing it with author JN to enhance rigour and minimise bias. Author LV subsequently applied this coding framework to the feedback data. Codes were then grouped into three categories related to positive feedback, suggestions for improvement, and help seeking. Throughout the coding and theming process, authors LV and JN engaged in regular reflection and discussion.

3 | RESULTS

3.1 | Participants

Figure 1 describes the number and proportion of young people who were referred, onboarded, and completed the optional outcome measures. A total of 13,792 young people were referred. Of those, 5709 (41.4%) used MOST at least once and consented for their data to be used for research purposes (Figure 1). This group made up the engagement sample. The mean age of young people was 17.5 years and those aged 15–18 made up 48% of the sample. The proportion of females was 64%, most lived in urban areas (68%), and 5% (5.2%) identified as Aboriginal or Torres Strait Islander. Fifty-five percent of young people were referred to MOST while on a service wait list. The mean PHQ4 score was 7.75, and 77% of young people scored above 6, indicating caseness[36] (Table 1).

3.2 | Platform and service use

Of those who used the platform at least once ($n = 5709$), the mean 12-week session count was 19.26 (SD = 41.34) (Table 2), with 71.7% using the platform for at least 14 days, 40.1% for at least 12 weeks, and 18.8% for at least 24 weeks (Figure 2). Young people spent an average of 129.3 min on MOST, with 65% engaging with psychotherapeutic content, 53% with the social network, and 92%, 25%, and 29% receiving messages from clinicians, peer workers and career consultants, respectively.

3.3 | Clinical outcomes and satisfaction

Table 3 summarises the clinical outcomes. Generalised estimating equation (GEE) models showed a statistically significant reduction of depression and anxiety as measured by the PHQ-4 at 12 weeks, with a small to medium effect size (Wald's $\chi^2 = 15.643$, $p < 0.001$, $d = 0.41$, 95% CI 0.35–0.46) and 44% of young people experiencing significant clinical improvement. There were significant improvements in psychological distress (Wald's $\chi^2 = 11{,}441$, $p < 0.001$, $d = 0.29$, 95% CI 0.25–0.35) and wellbeing (Wald's $\chi^2 = 7.213$, $p < 0.001$, $d = 0.19$, 95% CI 0.14–0.24) at 12 weeks, with small effect sizes, and 35% and 32% experiencing significant clinical improvements on psychological distress and wellbeing, respectively. Deterioration occurred in 15% (PHQ4), 14% (K10) and 19% (SWEMWBS). The effect size on the PHQ4 was moderate to large for those who received MOST while waiting for care over the 12-week intervention period (Wald's $\chi^2 = 41.4$, $p < 0.001$, $d = 0.77$, 95% CI 0.53–1.00).

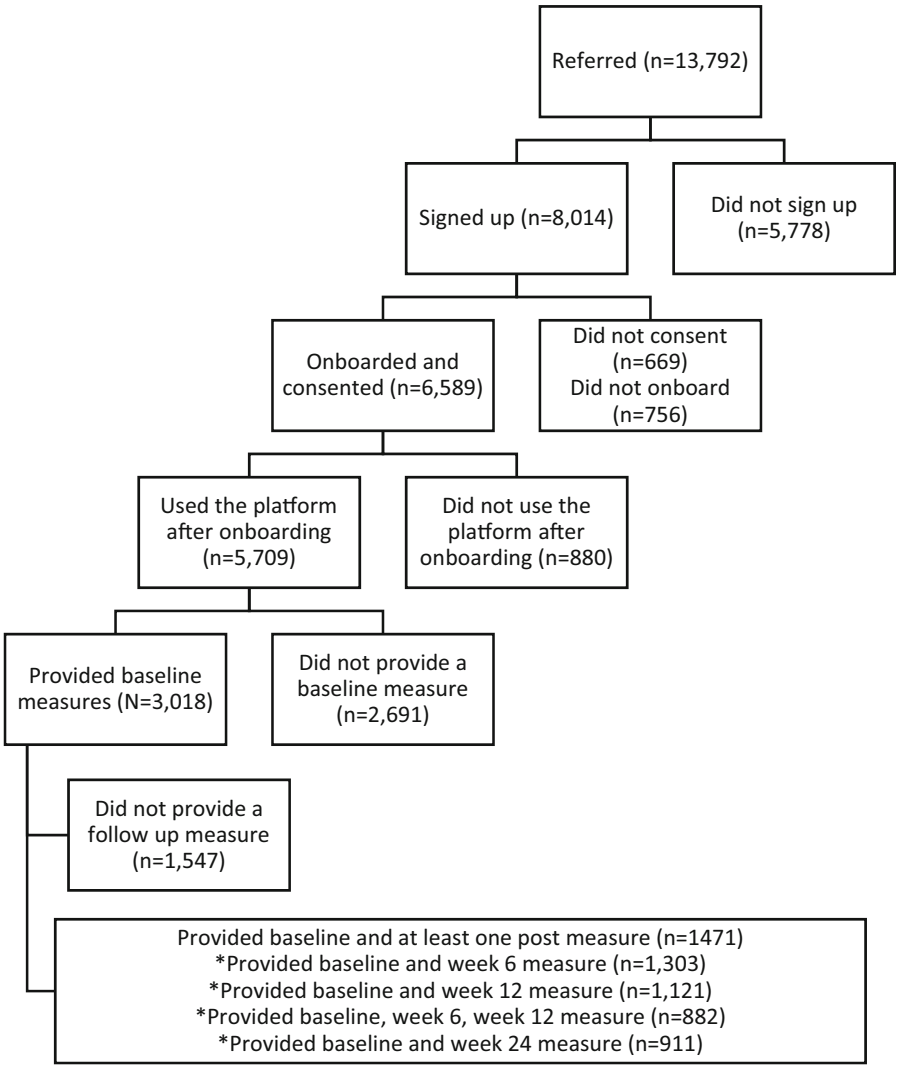

FIGURE 1 Participant flow.

Table 4 shows that of the 1495 young people who provided satisfaction ratings, mean scores of over 3.5 (out of 5) on 7 of the 8 satisfaction domains were observed, with only "has MOST helped you feel more socially connected" scoring just below 3.5 at 3.27. Moreover, 93% reported they would recommend it to other young people experiencing similar difficulties.

There was 1669 pieces of written feedback from 1118 young people. Of which, 68% ($n = 1132$) was positive. Common feedback included: perceiving MOST as a valuable resource and a supportive community with user-friendly navigation, a non-judgmental atmosphere, engaging features like the comics and toolkit, 24/7 availability, and the flexibility to go at their own pace. Effective moderation and the absence of harmful content was appreciated, and young people described that this distinguished MOST from other online communities. Young people valued connecting with others experiencing similar challenges, which normalised their experience and fostered a sense of connection and belonging.

Thirty-one percent (31%, $n = 515$) of feedback included suggestions for improvement. Selected examples include making MOST a smartphone app (now available), voice and video chat, easy content search, and better navigation, more content topics, faster human response times and notifications. One percent (1%, $n = 22$) of feedback related to requesting help, which was followed up by clinicians in real-time.

4 | DISCUSSION

To the best of our knowledge, this study constitutes the first large-scale evaluation of a multi-modal, integrated, digital intervention implemented across an extensive network of real-world YMH services. Over 32 months of service delivery in 262 YMH clinics spanning urban, rural, regional areas in Australia, MOST demonstrated sustained levels of engagement, high levels of satisfaction, as well as significant clinical improvements in combined

TABLE 1 Baseline demographic and clinical characteristics of MOST users.

Demographic measures obtained at onboarding		***N* = 5709**
Age		
Mean age (SD)		17.46 (3.28)
Age band		
<14		1086 (19%)
15–18		2629 (46%)
≥18		1978 (35%)
Gender		
Male (he/him)		1086 (19%)
Female (she/her)		3652 (64%)
Other (they/them and prefer not to answer)		971 (17%)
Locality		
Capital city or surrounds		3859 (68%)
Urban region		964 (17%)
Rural or remote region		882 (15%)
Treatment phase at referral		
Waiting for face-to-face care		2727 (58%)
Receiving face-to-face care		1259 (27%)
Approaching discharge or discharged		527 (11%)
Missing		226 (5%)
Referring service		
Headspace (Primary care)		3932 (69%)
Specialist services (Secondary care)		1775 (31%)
Referring service state		
Victoria		4236 (74%)
Queensland		1073 (19%)
New South Wales		334 (6%)
Australian Capital Territory		64 (1%)
Demographic measures from baseline assessment		***N* = 3316**
Aboriginal and/or Torres Strait Islander		172 (5.2%)
Born in Australia		2443 (74%)
English spoken at home		2514 (92%)
Employment		
Paid employment		1002 (37%)
Unemployed		478 (17%)
Other (student, home duties, disability)		1258 (46%)
Highest level of education		
Year 12 or less		2442 (89%)
TAFE/associate		201 (7%)
University degree		88 (3%)
Clinical measures from baseline assessment	***n***	
PHQ4 (mean, SD)	2648	7.75 (2.85)
PHQ4 caseness (*n*, % ≥6)		2044 (77%)
K10 (mean, SD)	2619	34.52 (8.27)
K10 caseness (*n*, % ≥21)		2513 (96%)
SWEMWBS (mean, SD)	2611	17.86 (4.48)

depression and anxiety in a large cohort of clinically representative young people, demonstrating the potential impact of integrating digital interventions within real world clinical settings.

The promise of DMHIs to integrate with, and enhance the impact of, mental health services has been undermined by poor real-world engagement in routine care.[15] For example, a study implementing two highly efficacious, human supported DMHIs in routine care found that fewer than 20% of participants completed the interventions.[18] Similarly, a systematic review of real-world engagement with digital self-help app interventions for depression or anxiety found that sustained use, defined as either completing all modules, the last assessment, or continued use after 6 weeks, ranged 0.5%–28.6%.[47] Engagement with popular commercial mental health apps (with at least 10,000 instals) is equally low, with only 3.3% of users still using the apps after 30 days.[19] By contrast, 55% of young people who used MOST were still active at 6 weeks, 40% at 12 weeks and 19% at 24 weeks. While these analyses included those who used the platform at least once—potentially biasing engagement rates positively—it is noteworthy that 87% of those who onboarded to MOST used the platform at least once. Overall, these findings support MOST's capability to provide sustainable support for young people within YMH services. The flexible, multi-component design of MOST together with the availability of human support may have enhanced the appeal of MOST and overall engagement rates, as previous studies have found that interventions that cater for the needs and preferences of users and offer human support are more engaging.[48,49] The patterns of use of MOST, with different young people engaging with different features and levels of human support, coupled with the finding that 62% reported that the intervention was relevant to their needs (compared with 9% who did not), lend support to this approach. That said, achieving sustained and meaningful engagement for greater numbers of young people remains a significant challenge.[50–53] Future research must establish the optimal levels of engagement with different intervention components to deliver best outcomes for young people. For example, our previous research has shown that engagement with therapeutic content and social features is more likely to result in improved outcomes compared with engaging with social features alone.[54,55] A forthcoming paper will utilise this real-world evaluation data to report on the relationship between intervention component use and clinical improvement employing machine learning methods.

Clinical outcome variables showed significant improvements with small to medium effect sizes in depression and anxiety, psychological distress, and psychological wellbeing. Similarly, the proportion of young

TABLE 2 Components used and degree of usage for each component for young people (YP) who have used the platform after onboarding over the first 12 weeks of usage.

	Number (percentage) of users who used this component	Mean (SD) Median (IQR)[a]
Platform usage statistics of all users post onboarding		
Number of unique sessions (logins)	5709 (100%)	19.26 (41.34) 7.00 (3.00, 18.00)
Time on platform (min)	5709 (100%)	129.36 (505.67) 29.63 (6.17, 95.98)
Time per session (login)	5709 (100%)	4.80 (4.80) 3.63 (1.36, 6.74)
Usage statistics of specific intervention components		
Mental health professionals		
Messages to clinicians from YP	2150 (38%)	6.65 (14.37) 3.00 (1.00, 6.00)
Messages from clinicians to YP	5278 (92%)	7.07 (11.16) 3.00 (1.00, 10.00)
Therapeutic content		
Viewed any item	3731 (65%)	17.60 (29.76) 7.00 (3.00, 19.00)
Social network		
Posts	2462 (43%)	2.91 (7.21) 1.00 (1.00, 2.00)
Comments	1753 (31%)	7.22 (23.24) 2.00 (1.00, 5.00)
Reactions	1918 (34%)	11.02 (36.20) 3.00 (1.00, 8.00)
Any post, comment, or reaction	3038 (53%)	7.17 (34.52) 1.00 (0.00, 4.00)
Peer workers		
Messages to peer workers from YP	970 (17%)	11.58 (28.10) 4.00 (2.00, 10.00)
Messages from peer workers to YP	1426 (25%)	9.82 (18.81) 5.00 (3.00, 10.00)
Career consultants		
Messages to career consultants from YP	650 (11%)	5.30 (11.56) 2.00 (1.00, 5.00)
Messages from career consultants to YP	1661 (29%)	4.27 (6.55) 2.00 (1.00, 5.00)

[a]Calculated only for those who used the component.

people who experienced a significant reduction in depression and anxiety was 44%, with 15% experiencing a clinical deterioration. Although the uncontrolled design of this study and that the young people were accessing concurrent face-to-face treatment does not allow any casual inferences, it is notable that the magnitude of the intervention effect for those on waitlists (those using MOST and not receiving face-to-face clinical care during the 12-weeks) was medium to large (ES = 0.77). This treatment effect compares well with face-to-face YMH services[45] and suggests that MOST alone may provide significant clinical benefits.

5 | LIMITATIONS

This study has several limitations. First, the uncontrolled design precluded any causal inferences about the

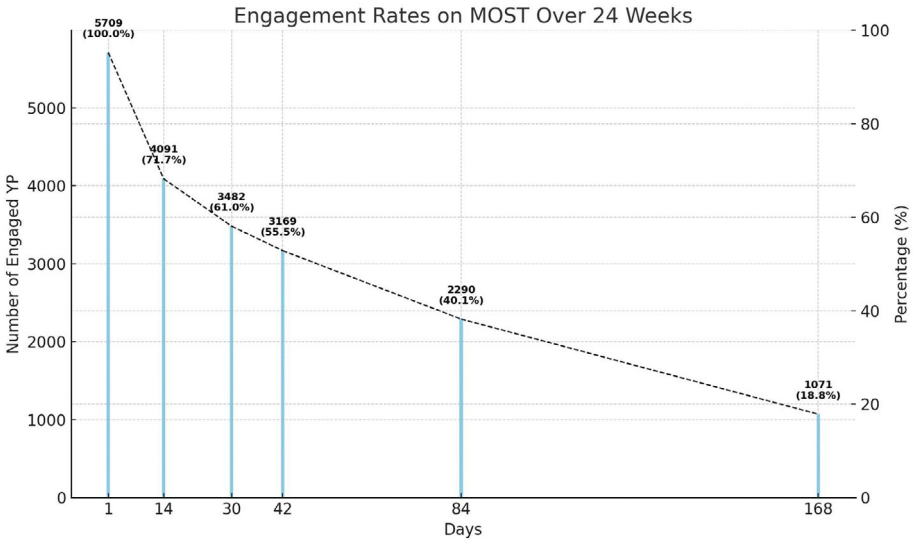

FIGURE 2 Sustained engagement for users after onboarding.

TABLE 3 Overall treatment outcomes.

	PHQ4	K-10	SWEMWBS
Baseline score (mean, SD, *n*)	7.75 (2.86) $n = 2648$	34.52 (8.27) $n = 2619$	17.86 (4.48) $n = 2611$
6-week score (mean, SD, *n*)	6.56 (2.99) $n = 1704$	32.13 (8.68) $n = 1649$	18.86 (4.82) $n = 1640$
12-week score (mean, SD, *n*)	6.46 (3.13) $n = 1381$	31.74 (9.29) $n = 1355$	18.95 (5.16) $n = 1350$
Effect sizes at week 12[a]			
Effect size [95% CI]	0.41 [0.35–0.46]	0.29 [0.25–0.35]	0.19 [0.14–0.24]
Effect size including only those with caseness [95% CI]	0.43 [0.37–0.49]	0.42 [0.32–0.56]	N/A
Effect size for those who remain on a service waitlist [95% CI]	0.77 [0.53–1.00] $n = 69$	0.44 [0.21–0.69] n = 69	0.19 [0.04–0.43] n = 69
Individual effect size category at week 12[a]			
Improvement (*n*, %)	491 (44%)	378 (35%)	342 (32%)
No Change (*n*, %)	461 (41%)	559 (51%)	535 (50%)
Deterioration (*n*, %)	162 (15%)	149 (14%)	203 (19%)

Note: Standard deviations (SDs) are shown in round parentheses for means; 95% confidence intervals are shown in square parentheses for effect sizes and percentage changes. 'Improved' effect size >0.5, 'no change' effect size between −0.5 and 0.5, 'deterioration' effect size <−0.5.
[a]$N = 1471$, which is the number that provided a baseline measure and at least one (week 6 or week 12) follow up measure. Multiple imputation, with the iterative-chained-equation method was used to compute missing data.

effectiveness of MOST. Two studies are currently underway evaluating the impact and cost-effectiveness of MOST (the EVOLVE trial) compared with treatment as usual as well as the effectiveness of an adaptive, tailored implementation strategy conceived to integrate MOST within the Australian national network of YMH services (the ATLAS study). Second, given that this was an evaluation of a real-world digital service implemented nationally and all assessments were conducted automatically and remotely, 51% of young people who completed a baseline measure did not complete a follow-up assessment. This may have positively biased the results (i.e., young people who felt more positively about the intervention or used it more often may be more likely to be assessed at follow-up). That being said, the reported attrition rate is comparable to that of research studies evaluating web-based interventions of the equivalent duration via remote assessments (51%–70%),[56,57] and

TABLE 4 Satisfaction and experience using MOST.

Item	Mean (SD) rating (out of 5)	Agree or strongly agree[a]	Disagree or strongly disagree[b]
Please rate how positive your experience of MOST has been [Positive experience]	3.98 (0.95)	997 (68%)	80 (5.5%)
Please rate the helpfulness of using MOST [Helpful]	3.72 (1.05)	862 (59%)	164 (11%)
How easily were you able to find what you needed on MOST? [Ease of use]	3.75 (1.05)	858 (59%)	160 (11%)
How relevant is the content on MOST? [Relevant]	3.80 (0.99)	909 (62%)	130 (8.9%)
Has using MOST helped you to better access support from others? [Supportive]	3.55 (1.14)	764 (52%)	255 (18%)
Has using MOST helped you feel better? [Felt better]	3.50 (1.14)	735 (50%)	267 (18%)
Has using MOST helped you feel more socially connected? [Social]	3.27 (1.23)	615 (42%)	385 (26%)
Please rate whether you felt safe using MOST [Felt safe]	4.25 (0.93)	1128 (78%)	60 (4.1%)
Recommend to others?	**Yes (*n*, %)**	**No (*n*, %)**	
Would you recommend MOST to other young people experiencing difficulties?	1356 (93%)	102 (7%)	

[a]Scored 4 or 5 out of 5.
[b]Scored 1 or 2 out of 5. $N = 1495$.

there were no differences in any baseline clinical variables between those who completed the follow-up assessment and those who did not. Third, the multimodal nature of MOST precludes the examination of the effectiveness and relative impact of the specific components of MOST. Although these research questions were outside the scope of this evaluation, the national deployment of MOST affords a unique opportunity to conduct rapid, generalizable, novel studies using, for example, hybrid experimental designs,[58,59] that ascertain the relative impact and optimal impact of different intervention components as well as successive iterations of the service.

6 | CONCLUSIONS

The results from this real-world evaluation featuring implementation across 262 YMH clinics demonstrated that MOST is a highly promising blended digital intervention as it yielded high satisfaction and perceived helpfulness, sustained engagement and encouraging improvements in clinical and wellbeing outcomes. These findings lend support to the multi-modal, adaptive, and integrated approach of MOST and its potential to deliver engaging, scalable, and complementary digital support that responds to the limitations of YMH services and adapts to the preferences and needs of young people.

Despite the potential of digital interventions to bridge gaps in service provision, they remain disconnected from government-funded, real-world, mental health services.[60,61] As a result, the expansion and integration of digital interventions into routine practice has become an international research, clinical, and policy priority.[10,60,62] This study uniquely features an integrated digital platform implemented across a large number of services, across a large swathe of Australia, and across varied states that have distinct health bureaucracies. Our findings support the benefits of integrating digital platforms within real-world YMH clinical settings, potentially addressing the limitations of these services in terms of timely access and continuity of care. For example, 55% used MOST while waiting for care, 27% in a blended fashion, and 11% as a treatment maintenance tool following discharge, underscoring the potential of MOST to deliver complementary support throughout the mental health care journey. Further research needs to delineate the optimal integration between digital and face-to-face services to enhance engagement, treatment effects and scalability.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

PEER REVIEW

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

ETHICS STATEMENT

Ethical approval for the use of the data was obtained from the Royal Melbourne Hospital Human Research Ethics Committee (HREC/83853/MH-2022).

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APPENDIX A

A.1 | Psychotherapeutic content outline on MOST

TABLE A1 Description of therapy journey and content features.

Component	Description
Guided therapy journey	A designed treatment pathway or journey that aims to address a specific mental health problem (e.g., depression) or goal (e.g., vocational support). The journey is comprised of several 'tracks', each targeting key mechanisms and clinical correlates associated with the particular focus through discrete activities.
Tracks	A track is akin to a module. Each track targets key mechanisms known to maintain or exacerbate the targeted mental health problem via a number of activities. These include the underlying psychological or behavioural patterns, such as negative thinking, avoidance strategies, or emotional dysregulation, which perpetuate the presenting problem. Other considerations within tracks include addressing clinical correlates, that is—the symptoms or conditions that may frequently co-occur with the primary mental health issue (e.g., social isolation). Therapy Journeys typically comprise of 7–10 tracks and clinicians have the ability to turn off (and on) activities within tracks as well as to change the order of tracks to personalise the delivery of treatment.
Activity types	**Description**
Key concepts (page)	Accessible psycho-educational descriptions of psychotherapeutic concepts covered in each track. Also includes myth-buster initiatives aimed at normalising mental health challenges and reducing stigma.
Comics	Narrative driven comics which focus on a particular therapeutic theme and targets related to the central theme of the therapy journey. Comic characters model adaptive strategies and behaviours to enhance consolidation of learning principles. See Figure A1 for an example.
Reflective actions	Designed to promote self-awareness and demonstrate comprehension of concepts and strategies addressed throughout the therapy journey. Reflective actions prompt young people to jot their thoughts via an online journal entry.
Regular actions	Behavioural experiments designed to encourage young people to test out learned strategies, and skills in real-world situations.
Audio and audio-visual	Audio storytelling provides mindfulness-based relaxation techniques via guided meditations. The Audiovisual content combines visual stimuli with auditory guidance to enhance the relaxation experience.
Talking points	Questions embedded within each of the tracks to encourage young people to discuss and share experiences with each other regarding a particular topic theme.
Explore function	**Description**
Standalone tracks	Discrete tracks (including topics on Body Image, Navigating the Mental Health System, Dealing with Covid) allowing young people the flexibility and autonomy of choosing specific content tracks tailored to their interests and needs (i.e., can be worked through alongside recommended guided therapy journey).
Activities	Standalone activities grouped by theme (e.g., communication skills), enabling young people to quickly access targeted strategies or skill-building exercises when they need them.

FIGURE A1 Example of Therapy Comic. Four panels taken from the therapy comic "Anxiety Cat" which provides psychoeducation on worry management and the application of self-compassion strategies. The comic features in the Finding Your Calm (Anxiety) Therapy Journey.