Global Action for Policy Initiative
Northeastern University

Working Paper

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August 2023

SSM - Mental Health 4 (2023) 100257

Contents lists available at ScienceDirect

SSM - Mental Health

journal homepage: www.journals.elsevier.com/ssm-mental-health

Social support and user engagement with task-shared psychological treatments in the real world: Findings from the PRIME India study

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ARTICLE INFO

Handling Editor: Prof B Kohrt

Keywords:
Task-sharing
Social support
Treatment engagement
Global mental health
Implementation science
Depressive disorders
Alcohol disorders

ABSTRACT

Purpose: Task sharing in psychological treatments has been recognized as an effective strategy for bridging the global mental health treatment gap. However, more research is needed to better support its implementation in routine care. Mental health services users' engagement with treatment is a crucial implementation factor, yet empirical evidence on its determinants remains sparse. The current study aims to investigate social support as a predictor of users' session attendance, a key indicator of treatment engagement, within a task-shared psychological treatment.

Methods: This is a secondary analysis of cohort study data from the Program for Improving Mental Health Care (PRIME) implemented in Sehore district, India, where trained non-specialist health workers delivered manualized treatment for depression and alcohol use disorder (AUD; $n = 240$ in depression cohort, $n = 190$ in AUD cohort). Quasi-Poisson regression models were used to assess the association between users' perceived social support at baseline and treatment session attendance at 3-month follow-up, controlling for socio-demographic and clinical characteristics.

Result: Within the depression cohort, a 4-point increase in social support score at baseline predicted a higher number of treatment sessions attended by 3-month follow up (IRR = 1.44, 95% CI: 1.06, 1.93). Within the AUD cohort, we noted insufficient statistical evidence for a weak association between users' social support and the number of treatment sessions attended in adjusted analysis (IRR = 1.02; 95% CI: 0.69, 1.49).

Conclusion: Our findings suggest that the implementation of task-shared psychological treatments for depression into routine care may be enhanced by strategies that activate or build upon the functional roles of users' social support.

1. Background

In low- and middle-income countries (LMICs), task-sharing has been at the forefront of the movement to address the dearth of mental health professionals and increase availability and access to mental health care. Task-sharing is a service delivery model primarily in community and primary care settings wherein non-specialist health workers (NSHWs) such as professionals (e.g., primary care doctors, nurses, community health workers) and non-professionals (e.g., lay providers) are trained and supervised on various parts of the mental health care process (e.g., screening for mental illnesses or delivering psychological treatments) (Esponda et al., 2019; Hoeft et al., 2018). Within randomized controlled trials (RCTs), task-sharing has been proven to be cost- and time-effective and efficient in the delivery of mental health care services leading to improvement in outcomes for those suffering from mental health conditions in LMICs (as compared to usual care) (Singla et al., 2017, 2021; van Ginneken et al., 2013, 2021). However, more research is needed on strategies to support its implementation in routine care settings to effectively reduce the global mental health treatment gap. One promising yet under-researched implementation factor is the engagement of users with task-shared psychological treatments. Users' engagement with psychological treatment is essential for treatment gains, sustained

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https://doi.org/10.1016/j.ssmmh.2023.100257
Received 21 July 2022; Received in revised form 17 August 2023; Accepted 21 August 2023
Available online 23 August 2023

treatment effects, and to prevent relapse or worse outcomes (Greene et al., 2016; Orhon et al., 2007; O'Brien et al., 2009). A key indicator of treatment engagement in outpatient settings is treatment session attendance.

Among a limited pool of implementation studies reporting session attendance within task-shared psychological treatment in real-world conditions, a recent one from India reported that only 12.3% and 5.5% of the participants completed all treatment sessions for depression and alcohol use disorder (AUD) (Shidhaye et al., 2019a). In another study in India, only 22% of the participants completed all sessions of a brief structured psychosocial treatment for depression delivered by non-specialist counselors (Shidhaye et al., 2017). These rates are lower as compared to those noted by RCTs of task-shared psychological treatment globally (Patel et al., 2010, 2017; Nadkarni et al., 2017; Chibanda et al., 2016; Jordans et al., 2016; Lund et al., 2020). This points to the need for identifying predictors of session attendance in routine care to inform strategies to enhance implementation of task-shared psychological treatments. Users' stable sociodemographic such as age, sex, religion, as well as transient clinical characteristics (for example, comorbidities, and mental illness symptom severity) have already been identified to be associated with mental health treatment session attendance (O'Brien et al., 2009; Swift and Greenberg, 2012). In the field of global mental health, cross-cultural and contextual factors such as explanatory models of mental illness, perception of utility or if the treatment is working for them, expectations of nature of mental health treatment and treatment outcomes, feelings of mistrust towards the treatment or the health care system, or logistical factors such as location and scheduling have also been reported to impact users' treatment session attendance (Dixon et al., 2016; Murphy et al., 2021; Office of the Surgeon General Center for Mental Health Services National Institute of Mental Health, 2001). By nature, task-sharing based mental health interventions addresses some of these barriers. For example, by incorporating psycho-education, it aims to bridge the gap between professional and lay understanding of mental illness and enhance the perception of utility of treatment; by using local idioms of distress, it strives to facilitate better communication with users; by involving CHWs and community health centers, it seeks to eliminate logistical barriers to accessing mental health care (Shidhaye et al., 2017). (See, methods for a discussion on demand-side barriers for this specific study). However, there remains more to be understood about other predictors of treatment attendance specific to task-sharing in LMICs. One approach would be to utilize the Social Determinants of Health (SDoH) framework to move away from proximal determinants to understand the impact of distal factors (e.g., social, economic, and environmental factors) impact users' treatment attendance within task-shared psychological treatments. SDoH has been recently reported to be crucial for ensuring successful implementation of health care interventions (Mensah and Riley, 2021). For example, patients' SDoH such as literacy, employment status, and food security have been found to be associated with the extent to their engagement with collaborative care for hypertension (Ibe et al., 2021).

Social cohesion and social capital are among the many important SDoH, as compiled by the World Health Organization, known to shape population health (Solar and Irwon, 2010). Both social cohesion and capital are characteristics of social relationships. They reflect the strength and features of such relationships, for example, networks, norms, and social trust. One of their key components is social support. Social support, a central attribute of an individual's social network, is often conceptualized as a psychosocial resource that involves "flow of affect or emotional concern, instrumental or tangible aid, information, and the like" (House et al., 1985). An individual's personal relationships and social interactions serve as a source of emotional support (such as empathy, compassion, belongingness), instrumental support (such as tangible aid), as well as informational support (such as advice, guidance, other useful information) (Kawachi et al., 2008). Social support, especially perceived social support, holds relevance for session attendance in psychological treatment and may influence attendance through either of two underlying pathways as identified in the literature so far (Thoits, 1985): (Esponda et al., 2019) higher perceived social support may reduce the distress experienced by a person due to their mental illness and limited everyday functionality, thereby reducing the perceived need for treatment, or (Hoeft et al., 2018) when there is severe functional impairment due to a mental health condition, with higher perceived social support, a person may seek help and engage more with treatment due to encouragement or even a "push" from their support networks. In some settings such as India, there is a pervasion of social interdependence and a person maintains deep ties with their family, neighbors, members of the caste and religion, etc. These ties are further characterized by emotional, moral, and practical support (Jacobson, 2004). Culturally, psychiatric patients have been informally and primarily cared for by family members amidst deinstitutionalization of mental health care in India and in the absence of formal, community-based psychiatric services (Hans and Sharan, 2021; Pinto, 2014). Family and community also plays a key role in treatment management given the cultural tradition of interdependence and the involvement of family members in labeling symptoms, deciding to seek help, and in treatment decisions (Das, 2016; Thara et al., 2004; Khandelwal et al., 2004; Pinto, 2011). Hence, social support may be a particularly relevant aspect of the SDoH framework for the implementation of task-shared psychological treatments. In the current study, we aim to investigate the association between mental health service users' social support and session attendance within a task-shared psychological treatment in India.

2. Methods

2.1. Study setting

The current study is a secondary analysis of data from a cohort study within the Programme for Improving Mental Health Care (PRIME) implemented in India. PRIME aimed at integrating mental health in primary care settings for improving access to care for depression and AUD in India and four other LMICs (Lund et al., 2012).

In India, PRIME implemented a Mental Health Care Plan (MHCP) in partnership with state and district governments at three Community Health Centers (CHCs)[1] in the Sehore district, a predominantly rural area in the state of Madhya Pradesh with a population of around 1.3 million. These three CHCs provided services to 239 villages in the district, covering a population of 268,833 (Shidhaye et al., 2019a). Embedded in the task-sharing approach, a main feature of MHCP was its focus on training NSHWs such as case managers (salaried CHWs appointed by PRIME) in identifying depression and AUD and in delivering evidence-based psychological treatments.

2.1.1. PRIME cohort study

Recruitment into the cohort study began 3 months after the initial implementation of MHCP in 2014. Participants were recruited from the outpatient clinics in the participating CHCs in the district. Those who screened positive on Patient Health Questionnaire-9 (PHQ-9; diagnostic instrument for depression) (Kroenke et al., 2001) or Alcohol Use Disorder Identification Test (AUDIT; diagnostic instrument for AUD) (Saunders et al., 1993) and received a diagnosis for depression or AUD were recruited to the treatment arm ($n = 281$ for depression; $n = 218$ for AUD). They received either the Healthy Activity Program (HAP) (Patel

[1] In India, the Government-funded health care infrastructure in rural areas has been developed as a three-tier system with 153,655 Sub-Centers (first contact point between primary health care system and the community), 25,308 Primary Health Centers (PHCs; a referral unit for 6 subcenters) and 5396 Community Health Centers (CHCs; a hospital/referral unit for 4 PHCs) functioning in the country (Ministry of Health and Family Welfare Government of India, 2005).

et al., 2017) or Counseling for Alcohol Problems (CAP) (Nadkarni et al., 2017), two culturally-adapted low-intensity psychological treatments for depression and AUD, respectively from case managers. HAP is a manual-based treatment for depression based on behavioral activation (helping patients engage in enjoyable activities) delivered in 3-phases over six to eight sessions, whereas CAP is manual-based treatment for AUD based on motivational interviewing (client-driven exploration of motivation and commitment to change) which is also delivered in 3 phases but in over up to four sessions. On the other hand, those who screened positive but were not diagnosed were recruited to the control group ($n = 157$ for depression; $n = 147$ for AUD) and received usual care for their general health from a doctor. Participants were assessed at baseline (following enrollment), 3-months post-recruitment, and 12-months post-recruitment. Of note, intent-to-treat analysis within PRIME's cohort study, comparing the treatment and control groups, revealed that the MHCP produced only a small to moderate effect on participant's depression and AUD symptom severity (difference in mean PHQ-9 score between intervention and comparison group in depression cohort at midline was −2.85 (95% CI: −3.88, 1.81) and at endline was −2.57 (95% CI: −3.58, −1.55). Difference in mean AUDIT score between intervention and comparison group in AUD cohort at endline was −2.71 (95% CI: −4.29, −1.13)) (Shidhaye et al., 2019a).

2.1.2. Potential challenges to treatment attendance within PRIME's MHCP

PRIME's qualitative process evaluation revealed various potential challenges, as identified by PRIME team and community advisory board, to participants' treatment attendance which were formatively addressed during MHCP's implementation (Shidhaye et al., 2019b). For example, initially patients demonstrated limited acceptability of psychological treatments and preferred pharmacological treatments. To combat this, case managers attempted clarifying the difference between the two and how "talk therapy" is also a part of treatment regime for mental illnesses. However, low acceptability remained a major barrier. This was also reflected in participants' unwillingness to sit through the sessions that they perceived to be too long. To address this, abridged sessions were delivered sometimes.

Despite these efforts, PRIME's implementation evaluation study reported low treatment session attendance as a major barrier (Shidhaye et al., 2019b). Among all patients enrolled in the program ($n = 1033$ with depression and $n = 575$ with AUD), only 5.42% of those with depression and 15.13% of those with AUD completed HAP and CAP. Similar statistics were also noted in PRIME's cohort study where only 12.3% and 5.5% of the participants with depression and AUD, respectively, completed all the treatment sessions (Shidhaye et al., 2019a). This is similar to another study from India where only 22% of the participants completed all sessions of a brief structured psychosocial intervention for depression delivered by non-specialist counselors (Shidhaye et al., 2017). As a strategy to increase attendance, case managers gave telephonic reminders of an upcoming treatment session up to a day prior to the session, however, without any improvement in session attendance. Efforts were also made to increase attendance by delivering treatment sessions at home or by involving government-sponsored CHWs, these measures were not sustainable because of the large number of patients and relatively small proportion of human resources. Hence, it is imperative to investigate the factors that may have influenced treatment attendance among PRIME participants.

For the current study, data from baseline survey (conducted at enrollment) and midline survey (conducted at 3-months follow up) of the treatment group were utilized.

2.2. Study variables

2.2.1. Social support: The predictor variable

Self-reported social support was assessed using the Oslo 3-item Social Support Scale at baseline (Dalgard, 1996). The scale included three questions measuring quantity of close confidants, accessibility of practical help, and sense of concern from other people. Participants were asked to respond to each question on a Likert scale ranging from 1 to 4 for quantity of close confidants (1 = "none" and 5 = "5+"), and 1 to 5 for accessibility of practical help (1 = "very difficult" and 5 = "very easy"), and for sense of concern from other people (1 = "none" and 5 = "a lot"). The total score ranges from 3 to 14 with higher values representing a higher level of social support. For the current analysis, total social support score was modeled as a continuous variable and was rescaled to reflect a 4-point change on the Oslo scale to demonstrate the influence of a meaningful change in social support levels on attendance. Individual item scores were also modeled as continuous variables but were not rescaled.

2.2.2. Treatment attendance: The outcome variable

Measured at the individual level, treatment attendance was operationalized using the number of treatment sessions attended by each participant by 3-month follow up after enrollment (possible range of 0–8 for HAP and 0–4 for CAP).

2.2.3. Covariates

The following socio-demographic and clinical variables were controlled for in the analysis: age, sex, education, marital status, employment, asset index, initial symptom severity, disability, internalized stigma, and whether someone received psychotropic medications for their diagnosis. All covariates were measured at baseline. Initial symptom severity was measured using PHQ-9 and AUDIT for the depression and AUD cohort, respectively. Disability was measured using WHO's 12-item Disability Assessment Schedule (WHODAS V.2.0) scale (Ustun et al., 2010). Internalized stigma was measured using the Internalized Stigma of Mental Illness Inventory (ISMI) (Ritsher et al., 2003).

2.3. Data analysis

We hypothesized that there were different mechanisms underlying the association between social support and treatment session attendance among those with depression as compared to those with AUD, and hence, a stratified analysis was conducted whereby the two cohorts were analyzed separately. For example, someone who is suffering from depression and with a higher social support may be less likely to attend treatment sessions as receiving formal treatment may be seen as unnecessary and stigmatizing (Venkatesh et al., 2015), and instead sources of social support will be depended upon to relieve of distressing symptoms. In contrast, with higher social support, those with AUD may have more encouragement from their support ties to engage in treatment since those with AUD have been found to be less likely to experience social stigma in India (Rathod et al., 2015). In addition, treatments prescribed for the depression and AUD cohorts- HAP and CAP, respectively-consisted of a different maximum number of sessions (8 for HAP and 4 for CAP), further providing support for conducting a stratified analysis.

First, we calculated the distribution of socio-demographic and clinical characteristics of the participants in the two cohorts using unweighted counts and percentages. Two categorical covariates (religion and marital status) had minimal variability, so we collapsed them into dichotomous variables for the analysis: for religion, "Muslims", "Christians", and "Others" were grouped together as "Others". For marital status, "Divorced", "Widowed", and "Single" were categorized together as "No Partner", and "Married" and "Married, not Living Together" was group together as "Has Partner").

Of the total sample included, 0.002% ($n = 1$; from depression cohort) was missing data on social support, 0.007% ($n = 3$) was missing data on ISMI score ($n = 2$ from depression cohort; $n = 1$ from AUD), and 22.8% ($n = 98$) was missing data on asset index ($n = 71$ from depression cohort; $n = 27$ from AUD cohort). To handle these missing data, we implemented a multiple imputation approach under a missing at random

assumption for missing values (Allison, 2000). Next, given that our outcome of interest had a count distribution, we ran model checks on the imputed datasets for Poisson regression. This indicated an over-dispersion in the data, upon which we decided to use quasi-Poisson models based on a lower value of Akaike Information Criteria or AIC, as compared to negative-binomial models. Finally, we applied multivariable quasi-Poisson regression models independently to 30 copies of the data, each with missing values imputed, to assess the association of baseline social support scores with the number of HAP/CAP sessions attended by participants of the respective cohorts by 3-month follow-up, controlling for the aforementioned covariates i.e., socio-demographic and clinical characteristics. We did not control for sex, employment status, and religion in the AUD cohort-analysis given the minimal variability within (see, Table 1).

All analyses were conducted in SAS software (version 9.4) (SAS Institute, 2004) with a nominal alpha-level of 5%. We report Incidence Rate Ratios (IRRs) and 95% confidence intervals. All covariates specified above were selected for their theoretical relevance and thus, results presented here are based on full analytic models that included all relevant variables.

Table 1
Baseline socio-demographic characteristics of the sample analyzed at midline.

	Depression Cohort $n = 240$	Alcohol Use Cohort $n = 190$	Total/Overall $n = 430$
	Mean (SD)		
Age	37.54(12.65)	40.48(12.23)	38.84(12.54)
	***n* (%)**		
Sex			
Men	90(37.50%)	189(99.47%)	279(64.88%)
Women	150(62.5%)	1(0.53%)	151(35.12%)
Education			
<Primary Education	54(22.50%)	53(27.89%)	107(24.88%)
>Primary education	103(42.92%)	94(49.47%)	197(45.81%)
Uneducated or illiterate	83(34.58%)	43(22.63%)	126(29.30%)
Employment			
Employed	120(50%)	184(96.84%)	304(70.70%)
Unemployed	120(50%)	6(3.16%)	126(29.30%)
Religion			
Hindu	213(88.75%)	186(97.89%)	399(92.79%)
Muslim	27(11.25%)	2(1.05%)	29(6.74%)
Christian	0(0%)	1(0.53%)	1(0.23%)
Other	0(0%)	1(0.53%)	1(0.23%)
Marital Status			
Married	210(87.50%)	182(95.79%)	392(91.16%)
Married, not Living Together	2(0.83%)	1(0.53%)	3(0.70%)
Divorced	1(0.42%)	0(0.00%)	1(0.23%)
Widowed	15(6.25%)	1(0.53%)	16(3.72%)
Single	12(5.00%)	6(3.16%)	18(4.19%)
Asset Index[a]			
Highest Wealth	56(33.14%)	41(25.15%)	97(29.22%)
Middle Wealth	57(33.73%)	48(29.45%)	105(31.16%)
Lowest Wealth	56(33.14%)	74(45.40%)	130(39.16%)
Symptom Severity[b]	14.36(3.08)	18.30(7.76)	–
WHODAS Score	10.48(6.44)	8.01(5.65)	9.39(6.22)
ISMI Score[c]	23.91(5.76)	23.93(6.25)	23.92(5.97)
Received Medication for Diagnosis			
Yes	162(67.50%)	128(67.37%)	290(67.44%)
No	78(32.50%)	62(32.63%)	140(32.56%)

[a] $n = 114$ missing data on asset index ($n = 71$ from depression cohort; $n = 27$ from alcohol use cohort).
[b] PHQ-9 score for depression cohort, and AUDIT score for AUD cohort.
[c] $n = 3$ missing data on ISMI score ($n = 2$ from depression cohort; $n = 1$ from AUD cohort).

3. Results

3.1. Study population

3 participants ($n = 2$ for depression; $n = 1$ for AUD) screened negative on PHQ/AUDIT at baseline and were excluded from the analysis. 34 participants (6.8% of the baseline sample size; $n = 21$ from depression cohort and $n = 13$ from AUD cohort) were missing most data at baseline and were subsequently lost to follow up and hence, were removed from the analysis. 32 participants (6.9% of the sample analyzed at baseline; $n = 18$ from depression cohort and $n = 14$ from AUD cohort) were lost to follow-up at midline and were also removed from the analysis. In depression cohort, on an average, those who were lost to follow up at midline were about 6 years younger ($p = 0.04$) and were majorly Hindu ($p = 0.04$). A majority of these also have had at least primary education, were employed, married, belonged to the lowest wealth category, and had slightly lower levels of social support, however, these differences were not statistically significant. In the AUD cohort, there were no statistically significant differences between those who were lost to follow-up at midline and those who were analyzed, however, those lost to follow up were younger, employed, Hindus, married, and belonged to the lowest wealth category. The final sample size analyzed was $n = 430$ ($n = 240$ for depression and $n = 190$ for AUD; see Fig. 1).

Sample characteristics of the analytic sample are presented in Table 1. Overall, the average age of the sample was 38.8 years (SD = 12.54). Much of our sample was male (62.88%), employed (70.7%), Hindu (92.79%), married (91.16%), fell within the lowest wealth category (39.16%), and received psychotropic medication for their diagnosis (67.44%). A little less than half of the sample had at least primary education (45.81%). Lastly, the sample, on an average, showed moderate disability (mean WHODAS score = 9.39) and internalized stigma (ISMI mean score = 23.92).

3.1.1. Cohort-specific sample distribution

The distribution of characteristics within the two cohorts was similar to the overall distribution, except for some variables. A majority of the depression cohort was female (62.5%), whereas the AUD cohort was predominantly male (99.47%). Furthermore, half of the depression cohort was employed, and on the other hand, 96.84% of those in AUD cohort were employed. The depression cohort also had a slightly higher level of disability (mean WHODAS score = 10.48) as compared to AUD cohort (mean WHODAS score = 8.01).

Furthermore, in the depression cohort, between enrollment and 3-month follow-up, most participants either attended no sessions ($n = 86$) or attended 1 session of HAP ($n = 92$), while only some attended 2 or more sessions ($n = 62$; Fig. 2). On the other hand, in the AUD cohort, most participants attended no sessions ($n = 94$), $n = 56$ attended 1 session, and $n = 40$ attended 2 or more sessions (Fig. 3).

3.2. Results from the depression cohort

Within the depression cohort (see, Table 2, Model A), we noted a significant positive association between participants' social support at baseline and number of HAP sessions attended by the 3-month follow up. Controlling for socio-demographic and clinical characteristics, a 4-point increase in OSLO score at baseline predicted a 44% increase in

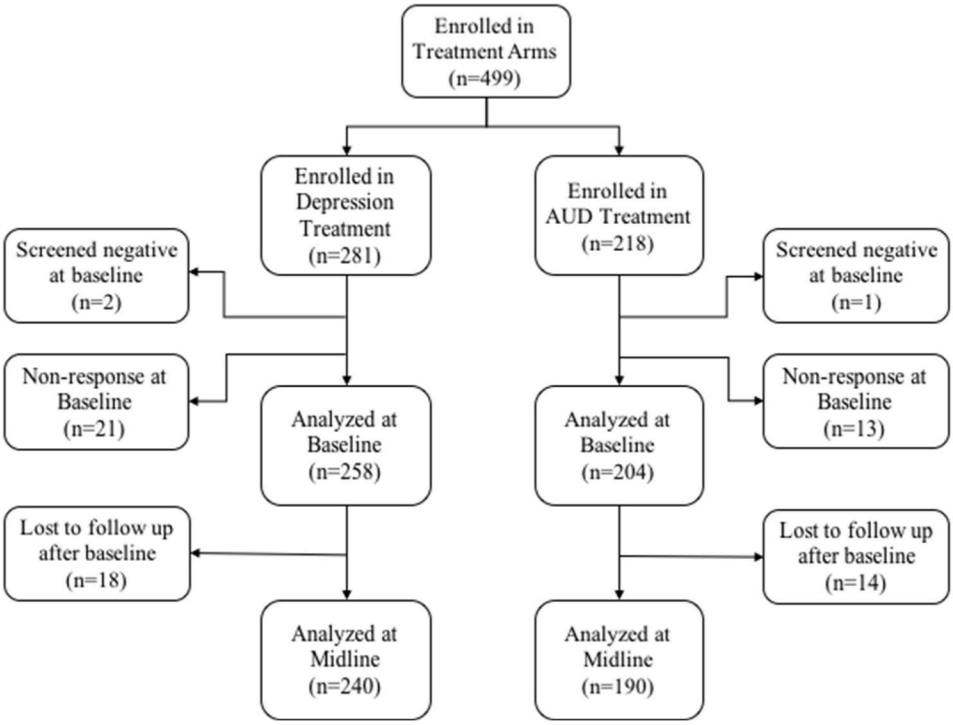

Fig. 1. Sample size analyzed.

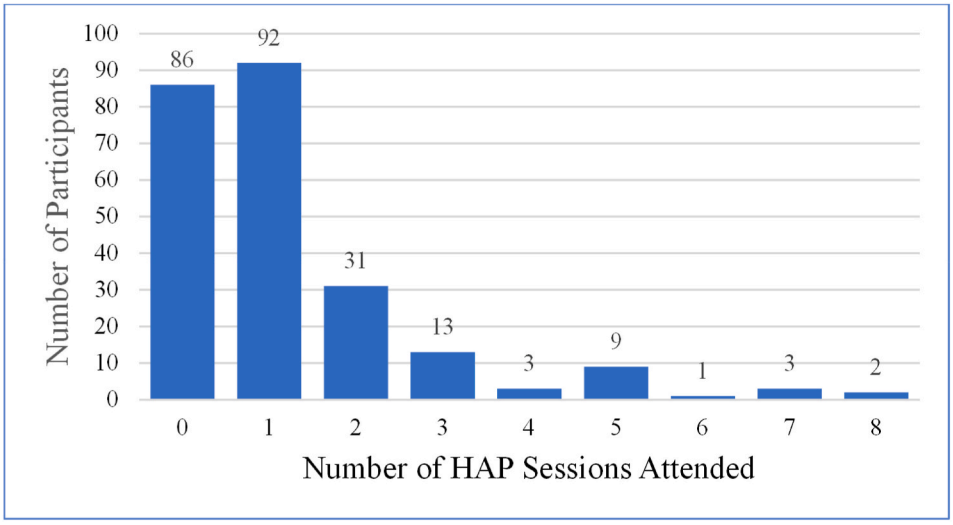

Fig. 2. Distribution of HAP session attendance in the depression cohort.

the number of HAP sessions attended by 3-month follow up (IRR = 1.44, 95% CI: 1.06, 1.93). In addition, only lower WHODAS score (IRR = 0.96, 95% CI: 0.93, 0.99) and psychotropic medication use (IRR = 2.04, 95% CI: 1.38, 3.03) were strongly and significantly associated with higher treatment attendance.

Considering individual items on the social support scale in the depression cohort, higher perceived accessibility of practical help from others (IRR = 1.20, 95% CI: 1.02, 1.42) and quantity of close confidants (IRR = 1.23, 95% CI: 1.07, 1.54) were associated with a higher treatment attendance, controlling for socio-demographic and clinical characteristics (Table 3).

3.3. *Results from the AUD cohort*

In the AUD cohort (see, Table 2, Model B), controlling for socio-demographic and clinical characteristics, we noted insufficient statistical evidence for a very weak association between participants' social support at baseline and the number of CAP sessions attended by the 3-month follow up (IRR = 1.02; 95% CI: 0.69, 1.49). However, being in the highest wealth category (as compared to the lowest category; IRR = 1.92, 95% CI: 1.18, 3.13) and psychotropic medication use (IRR = 2.32, 95% CI: 1.42, 3.78) were associated with a higher attendance of CAP sessions (Table 2, Model B).

For the individual social support scale items, we again did not find sufficient statistical evidence for the association of perceived accessibility of practical help from others, number of close confidants, or sense

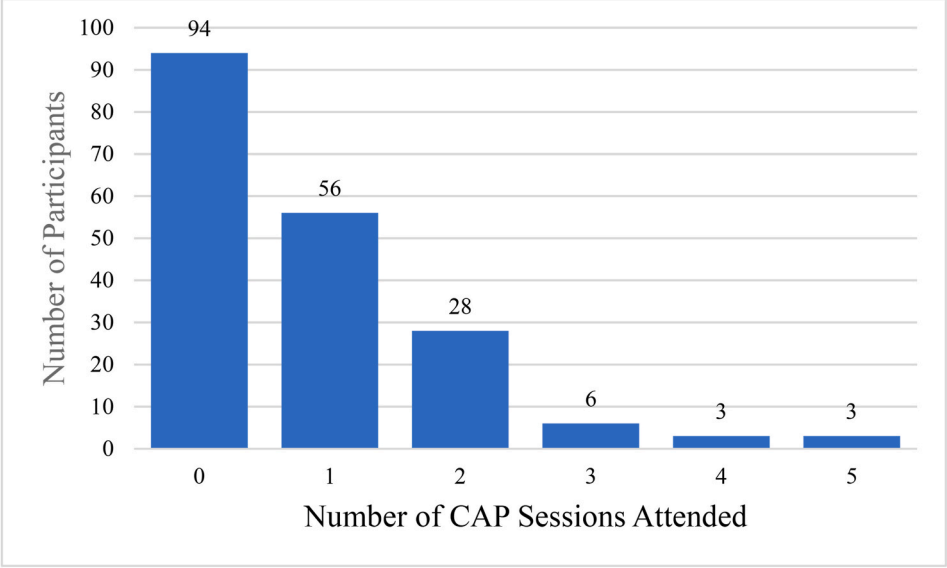

Fig. 3. Distribution of CAP Session Attendance in the AUD Cohort
$n = 3$ participants reported attending 5 sessions which is more than the maximum number of CAP sessions one could receive, however, if participants needed, they could continue receiving treatment/attending sessions.

of concern from other people with treatment attendance, controlling for socio-demographic and clinical characteristics (Table 3).

4. Discussion

This study provides evidence for the association between users' social support and their treatment session attendance within a task-shared psychological treatment. Higher baseline social support, especially a higher perceived accessibility of practical help from others and a higher quantity of close confidants, was associated with a higher number of HAP sessions attended by 3-month follow-up among those with depression. However, we found insufficient statistical evidence for such an association among those with AUD. In addition, we found that among those with depression, a lower disability score was associated higher treatment attendance. And among those with AUD, having a higher wealth index (i.e., a higher economic status or cumulative living standard) was associated with a higher number of treatment sessions attended. In both cohorts, psychotropic medication use was associated with a higher treatment session attendance. Below, we discuss the potential underlying mechanisms and suggest future directions with an aim to enhance the implementation of task-shared psychological treatments in India and other LMICs.

4.1. Role of social support in enhancing treatment attendance for those with depression

One explanation for the association we report between social support and treatment attendance among those with depression is that higher levels of social support may supply users with informational (encouragement or "push") and/or instrumental support (transportation, child care, etc.) from social ties, especially close confidants, to seek mental health care and engage in psychological treatments. However, the role of contextual factors relevant to the study setting need to be considered in evaluating the plausibility of this mechanism. Particularly, given that explanatory models of mental illness impact treatment seeking and adherence (Okello and Neema, 2007), this mechanism seems more plausible among populations that attribute mental illness to biological causes and hold a higher perceived utility and efficacy of modern psychological treatments (Dinos et al., 2017). As an example, Pescosolido et al. (1998) reported that among poorer populations (which the authors argued likely held less positive perceptions of psychological treatments), higher social support led to a decrease in formal mental health services use. In India, especially in rural areas, depression is often conceptualized as "a social and economic rather than a mental health problem" (Kermode et al., 2010) and prevalent stigma against mental illnesses has also been reported to act as a barrier to mental health services utilization (Shidhaye et al., 2015; Ahmedani, 2011). In light of such contextual factors, it seems likely that PRIME's awareness creation efforts at the community-level may have helped activate the functional roles of the social ties to provide tangible support and encouragement needed to attend treatment sessions. However, this remains a speculative claim since a measure of perceptions of mental health care among users and their social ties was not available for the current study. Furthermore, accessing care from mental health professionals such as psychiatrists has been reported to be stigmatized in rural India (Kermode et al., 2009). The delivery of HAP by NSHWs might have also aided in combating the associative stigma attached to mental health professionals through agents that normalize their experiences (Rathod et al., 2017), and fostering the positive influence of social support on treatment session attendance.

4.2. Social support and treatment attendance among those with AUD

Within the AUD cohort, we found insufficient statistical evidence of the association between users' social support and number of CAP session attendance. An earlier community-level cross-sectional study within PRIME in India reported that a very small percentage of their sample communicated their problems with alcohol to spouses, family members, or friends (Rathod et al., 2015). Such unawareness among social ties may not have given an opportunity for directed support and encouragement for treatment attendance that may explain the null association we report. Moreover, previous studies point to the role of support and care (or sometimes even pressure and influence) received from family members which might play a more important role for providing motivational, emotional, and logistic support for treatment seeking and follow ups for AUD as compared to support received from outside of one's family (Sarkar et al., 2016, 2020, 2021; Perumbilly et al., 2019; Chadda and Deb, 2013).

In addition, lack of perceived need for treatment of AUD among users has been found to be an important predictor of treatment seeking and

Table 2
Depression and AUD cohorts: Multivariable association of social support at baseline with number of HAP/CAP sessions attended by 3-month follow-up.

VARIABLE	Depression Cohort (Model A)			AUD Cohort (Model B)		
	IRR[a,b]	95%CI	*p-value*[c]	IRR[a,b]	95%CI	*p-value*[c]
Total OSLO Score	**1.44**	**1.06, 1.93**	**0.017**	1.02	0.69, 1.49	0.92
Age	0.99	0.98, 1.01	0.6	1.02	0.99, 1.03	0.06
Sex						
Male	1.00	–	–			
Female	0.77	0.46, 1.29	0.33			
Education						
Non-formal/Less than Primary School	1.00	–	–	–	–	–
Primary School and Above	0.92	0.59, 1.43	0.72	1.05	0.67, 1.66	0.82
Uneducated/ illiterate	1.24	0.82, 1.87	0.3	0.69	0.4, 1.21	0.19
Employment Status						
Unemployed	1.00	–	–			
Employed	0.74	0.46, 1.19	0.22			
Religion						
Others	1.00	–	–			
Hindu	1.02	0.65, 1.62	0.92			
Marital Status						
No Partner	1.00	–	–	–	–	–
Has Partner	0.74	0.49, 1.09	0.13	1.13	0.29, 4.25	0.86
PHQ-9 Score	1.03	0.98, 1.08	0.26	1.01	0.98, 1.04	0.37
WHODAS Score	**0.96**	**0.93, 0.99**	**0.03**	0.97	0.94, 1.04	0.18
Asset Index						
Lowest Wealth	1.00	–	–	–	–	–
Middle Wealth	1.05	0.68, 1.61	0.82	1.46	0.89, 2.41	0.13
Highest Wealth	1.07	0.68, 1.67	0.76	**1.84**	**1.12, 3.02**	**0.02**
Total ISMI Score	1.02	0.99, 1.06	0.17	0.98	0.95, 1.02	0.43
Received Medication for Diagnosis						
No	1.00	–	–	–	–	–
Yes	**2.05**	**1.38, 3.05**	**0.0004**	**2.3**	**1.41, 3.77**	**0.0009**

[a] All reported IRRs are rescaled to reflect a 4-point change in OSLO social support score.
[b] Model A adjusted for baseline age, sex, education, employment, religion, marital status, PHQ-9 score, WHODAS score, asset index, ISMI score, and receiving psychotropic medication for diagnosis. Model B adjusted for the aforementioned covariates except for sex, employment, and religion.
[c] Using a 2-tailed test, with $p < 0.05$ considered significant.

Table 3
Multivariable association of each social support scale item at baseline with number of HAP/CAP sessions attended by 3-month follow-up.

VARIABLE	Depression Cohort		AUD Cohort	
	IRR[a,b]	95%CI	IRR[a,b]	95%CI
Individual OSLO Social Support Scale Items				
Accessibility of practical help	**1.20**	**1.02, 1.42**	0.89	0.72, 1.09
Sense of concern from other people	1.06	0.89, 1.27	1.17	0.91, 1.49
Quantity of close confidants	**1.23**	**1.07, 1.54**	1.02	0.82, 1.26

[a] All reported IRRs reflect a 1-point change in individual OSLO social support item scores.
[b] Model for depression cohort adjusted for baseline age, sex, education, employment, religion, marital status, PHQ-9 score, WHODAS score, asset index, ISMI score, and receiving psychotropic medication for diagnosis. Model for AUD cohort adjusted for the aforementioned covariates except for sex, employment, and religion.

utilization (Edlund et al., 2009). PRIME's community-level survey reported that only a small proportion of those with AUD sought treatment, suggesting the lower perceived need for treatment of AUD in the community (Rathod et al., 2015). Hence, despite community-level awareness efforts and even with higher levels of social support, it could potentially be that CAP attendance was driven by users' perception of need, or a lack thereof given personal shame, and possible attribution of alcohol-related problems to factors such as family disturbance, financial problems, or peer pressure (Pal et al., 2003; Nadkarni et al., 2013). Furthermore, alcohol use and abuse may impact users' social interaction and lead to loss of social support which might further explain the null association (Saxena et al., 2003), however, a majority of participants in our sample reported having moderate to high level of social support.

4.3. The role of other sociodemographic and clinical characteristics

In our analyses, we also included several sociodemographic and clinical covariates that have been previously reported to be associated with mental health treatment attendance. However, in our sample, only some were found to be significantly associated with treatment session attendance: level of disability and functional impairment in the depression cohort, and psychotropic medication use across both cohorts. First, the WHODAS scale measures levels of disability and functional impairment across six domains: cognition (understanding and communicating), mobility (moving and getting around), self-care (hygiene, dressing, eating, and staying alone), interacting with others, life activities (domestic responsibilities, leisure, work, and school), and participation in society (Ustun et al., 2010). A higher level of disability in our sample may have acted as barrier to comprehending importance of treatment, traveling to the CHC for treatment sessions, or for making time to attend treatment sessions amidst the challenge to complete other daily responsibilities, ultimately impacting treatment attendance. Such a mechanism also seems plausible among those with AUD, however, we did not find sufficient statistical evidence for the same. Future studies would need to further understand the pathways through which disability and functional impairment impacts treatment attendance among those with depression and AUD to inform strategies to enhance implementation of task-shared psychological treatments.

Second, the strong association we found between psychotropic medication use and higher treatment session attendance across depression and AUD cohorts deviates from evidence reported in the literature so far. Psychotropic medication use has been associated with higher likelihood of treatment session non-attendance in primary healthcare services in Australia (Munasinghe et al., 2020). Such evidence has also been recorded in United Kingdom owing to the side-effects of medications and the resultant lack of energy and motivation to attend treatment sessions (Dilgul et al., 2018). The reason for such inconsistency remain unclear however, the aforementioned evidence originate from HICs and

differences in populations, settings, and other adjusted factors may explain the variation. Furthermore, psychotropic medication use has been seen as an indicator of treatment adherence and attendance; users taking medications may be more motivated to attend treatment sessions. Alternatively, it may also be that medication use alleviated depression and AUD symptoms that hindered users from attending treatment sessions (Kruse et al., 2002; Amodio, 2013).

4.4. Strengths and limitations

Our study is the first, to our knowledge, to examine the role of social support in users' treatment engagement in a task-sharing based mental health intervention globally and the longitudinal design is an additional strength eliminating the potential bias due to reverse causation. However, the limited generalizability of the findings must be considered while interpreting them. Future research would need to examine the extent to which our findings apply to task-shared psychological treatment in other parts of India, especially in urban settings, for other mental illnesses, and in other LMICs. In addition, there may be limited generalizability of our findings among women with AUD given that the AUD cohort was almost all men. Lastly, the analytical approach used in this study does not take into account the correlation among treatment sessions, for example, the effect of a treatment session on the likelihood of attending the consecutive session.

4.5. Implications and future directions

With an aim to enhance the implementation of task-shared psychological treatment in India and other LMICs, our findings offer evidence linking users' perceived social support to treatment session attendance that should be informative to global mental health researchers and implementation scientists. Our findings can also help identify user groups with depression at a risk of lower treatment session attendance within a task-shared psychological treatment model. Particularly, our results highlight that social support (and potentially social networks) are not outright barriers to psychological treatment seeking within mental health task-sharing in India, in contrast to findings from previous studies (Okello and Neema, 2007) and future research would need to further explore the underlying mechanisms to better understand the role social and familial support may play in facilitating treatment attendance. The scope may also be expanded to understand the impact of social networks such as by using the Network Episode Model (Pescosolido et al., 2010) within mental health task-sharing. Future studies could also focus on understanding the underlying role of community-level efforts to raise awareness and address mental health stigma, as well as reliance on community-level workers (as compared to mental health professionals) in attenuating stigma that might lead social and familial networks to discourage treatment seeking and attendance. In addition, more research is also needed to understand how users' perceived social support may impact other aspects of treatment engagement such as medication adherence, practicing skills learned in sessions, etc. Finally, in the light of a sharp decline in the number of treatment sessions attended by participants in both depression and AUD cohorts, and the potential threats to treatment attendance discussed in section 2.1.2, there remains a need to continuously monitor and evaluate acceptability of task-shared psychological treatments in the real world context and its various potential predictors, including social support.

5. Conclusion

Within task-shared psychological treatment in LMICs, low treatment attendance appears as a major challenge. While research has provided evidence for the impact of users' sociodemographic and clinical characteristics on treatment attendance, factors from within the social determinants of health framework needs to be researched to provide further insights into drivers of low attendance in task-shared psychological treatment. Among a sample of users with depression, our findings show that higher level of perceived social support was associated with a higher number of treatment sessions attended. However, such association was not found among those with AUD. Our findings have implications for enhancing user engagement in task-shared psychological treatments, although further research is needed to understand the underlying mechanisms and the interaction of social support with different diagnoses. Finally, our findings also hold implication for drawing attention towards the important role of social determinants within implementation science to effectively bridge the mental health treatment gap through task-sharing.

CRediT authorship contribution statement

Saloni Dev: Conceptualization, Methodology, Formal analysis, Data curation, Writing – original draft, Writing – review & editing, Visualization. **John Griffith:** Methodology, Writing – review & editing, Supervision. **Vikram Patel:** Writing – review & editing. **Alisa Lincoln:** Writing – review & editing, Supervision.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

We would like to express our deep gratitude for Dr. Rahul Shidhaye for his invaluable support in helping us obtain access to the PRIME India's cohort study data.

This work is an output of the PRogramme for Improving Mental Health CarE (PRIME). This work was supported by the UK Department for International Development [201446]. The views expressed do not necessarily reflect the UK Government's official policies.

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