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REVIEW ARTICLE

A systematic literature review and meta-analysis of randomized control trials on the influence of shared decision-making as intervention on patients' satisfaction among mental healthcare

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Abstract

Objective This study aimed to assess how the Shared decision-making (SDM) as intervention influences the patents' satisfaction.

Methodology The databases including PubMed, Scopus, CINAHL, and Cochrane library searched for relevant studies. PRISMA guidelines were followed for screening of literature as per the inclusion and exclusion criteria, then Cochrane Collaboration's Risk of Bias tool employed for methodological quality assessment. The final pooled effect analyzed with random effect model, standard mean difference along inverse variance to find association with between SDM and patients' satisfaction. The data analysis was carried out with RevMan v.7.2.0.

Results The findings revealed SDM positively associated with patient's satisfaction (SMD) = 0.33, CI: 0.02, 0.57, $p = 0.04$), with heterogeneity across trails ($chi^2 = 53.13$, $p < 0.01$, $I^2 = 83\%$). In sub-group analysis significant relation found with factor including duration exposing to intervention (> 3 months) (SMD) = 0.47, CI: 0.06, 0.88, $p = 0.03$), Electronic based intervention (SMD) = 0.50, CI: 0.02, 0.99, $p = 0.04$), studies utilized CSQ tool (SMD) = 0.19, CI: 0.02, 0.35, $p = 0.03$). Studies involved in narrative synthesis of outcome also shown similar outcomes to findings of meta-analysis.

Conclusion This study findings showed significantly positive relation among those exposed to SDM as intervention in comparison to usual care, other considerable factors also reported in this study.

Keywords Shared decision-making · Mental healthcare · Patients' satisfaction · Patients centered-care · Patients' involvement

Introduction

Measuring the patient's satisfaction with care provide insights about healthcare quality on the daily basis (Ferreira et al. 2023), previous studies stated satisfaction with care establishes positive relationship with healthcare system (Alhajri et al. 2023), then it shows reflexes on patient health outcomes (Richman and Schulman 2022). For strengthening patients' healthcare provider relation requires effective communication, trust, and respecting patients' autonomy in accordance with the modern ethical codes (Rosca et al. 2023). As per patient's personal characteristics includes disease condition, cultural ethics, experiences, family well-being in terms of financial status they preferably look forward for methods which are best suitable (Cassell 1998). In such case engaging the patients as a decision-makers during the clinical encounter is the ideal intent of patient-centered care, to make the patients an active participant in decision-making is important, few developed methods reported, among those Paternalistic approach (PA) one of the methods where patients make final choice of treatment under the healthcare providers supervision, in another method Informed Choice Approach (ICA) physicians' make decisions as representative of the patient (Sandman and Munthe 2010; Elwyn et al. 2001). The lack of priority to the patients' preferences and needs in these above-mentioned approaches, the concept of *"Shared decision-making*

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(SDM)" works as predominant methods with intention of prioritizing the patients' autonomy.

SDM is a collaborative process in which patients and healthcare professionals work together to make healthcare decisions based on the best available evidence and the patient's preferences. It involves exchanging information, discussing options, and making decisions collaboratively, to ensure that the decision aligns with the patient's goals and values (Rencz et al. 2019). There were two experts involved in making the decision, from one end the patients' themself act as lead according to their preferences, another expert healthcare professionals with knowledge on the available treatment options guide the patients in choosing the best options amongst along with maintaining the balance between consequences and benefits (Wrzal et al. 2022). Patients who participate in their treatment planning are more satisfied with their care, have more knowledge about conditions, tests, and treatment, have more realistic expectations about benefits and harms, are more likely to adhere to screening, diagnostic, and treatment plans, and have less decisional conflict and anxiety (Nørgaard et al. 2022).

In the context of chronic conditions such as diabetes, hypertension, cancer and surgical procedures including such as joint replacements or spinal surgeries SDM has been linked to improved adherence to treatment plans, better disease management, reduced anxiety, and higher satisfaction with the chosen treatment (Moleman et al. 2021; Légaré et al. 2008; Stiggelbout et al. 2015; Sepucha et al. 2013). In mental health settings, involving patients in treatment decisions through SDM has been linked to improved medication adherence, reduced hospital readmissions, and better overall mental health outcomes (Hamann et al. 2005). In fact, as per the study reports the psychiatric patients value the priority of their involvement in decision-making (Adams et al. 2007). Thamson et al. conducted a systematic literature review to find out the intervention characteristics among psychiatry and vitger et al. also reported the outcome associated with involving the patients in SDM intervention in comparison to usual care procedure. Both studies discussed about patients' satisfaction as secondary outcomes and vitger focused only on the digital intervention of SDM (Thomas et al. 2021; Vitger et al. 2021), along with this Stovell and colleagues mentioned that no significant improvement in building the relationship between patients and healthcare providers, but they observed empowerment of SDM (Stovell et al. 2016). So, measuring the patients' satisfaction with care gives an idea about the how patients perceived their care, they felt about the quality of care, and how much they satisfied with health improvement with the involvement of SDM and their relation with HCP. This study aimed systematically assess the patient's satisfaction with SDM process as compared with routine treatment procedure.

Methodology

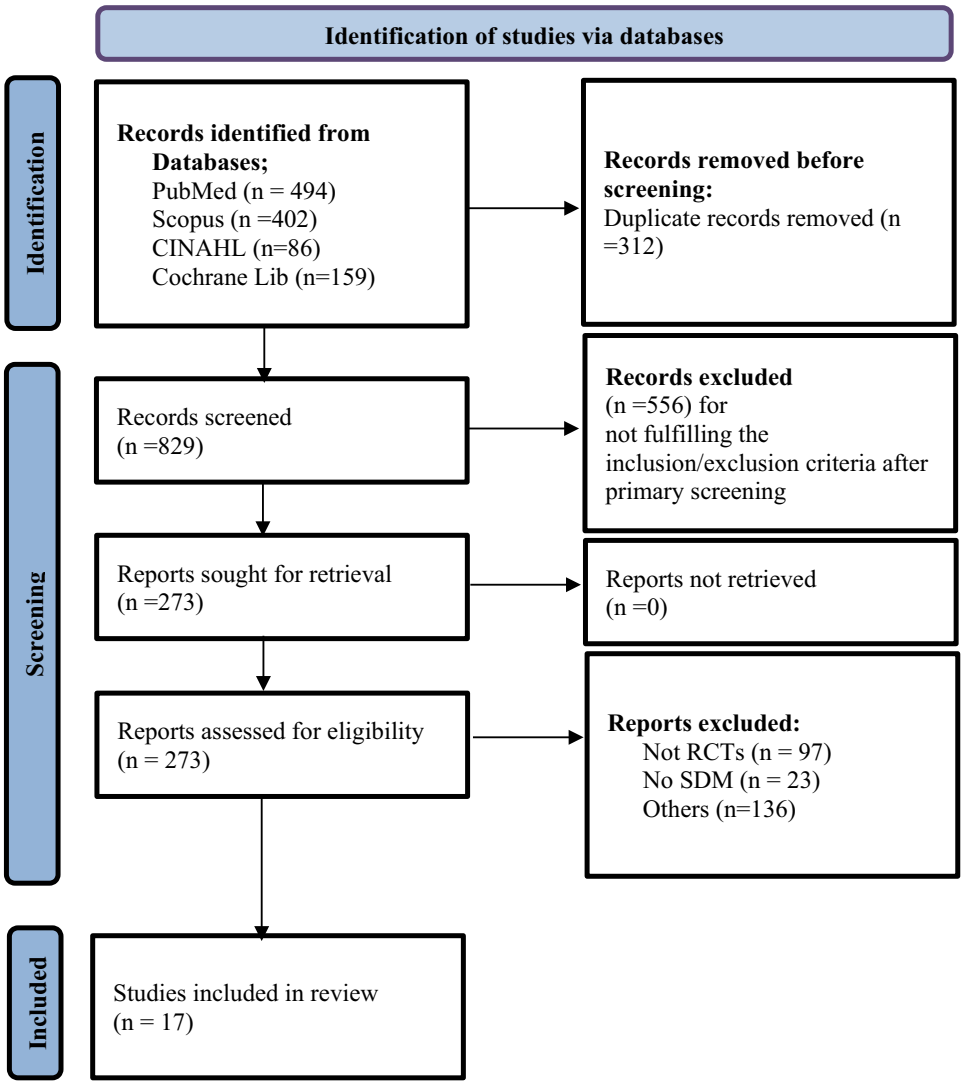
Literature extraction An extensive literature search was conducted to identify the studies relevant to the study objective through various databases including PubMed, Scopus, CINAHL, Cochrane library (Fig. 1). Based on the PICO, we identified the key terms related to study questions, then our team worked in collaboration with the institute librarian for development of search terms to retrieve studies from databases. Different MeSH terms were gathered based on PICO and prepared search strategies for data retrieval in PubMed, then the same keywords were rephrased to recover the literature from other databases. The search duration of the literature is limited to Sep 2023 for only English language, citation of the included studies also potentially searched for matching studies.

Inclusion/exclusion criteria Studies followed the below mentioned criteria included in the present study 1) Only RCTs 2) studies which introduced SDM as an intervention through any approach i.e.decision aids and online practice services etc. 3) patients with psychiatric disorder at least 50% within the study population 4) No restriction on patient related demographics 5) The intervention applied either on patients or healthcare providers 6) studies reported patients health outcomes satisfaction, either it is care planning or overall satisfaction. Studies other than RCTs, intervention tested on patients without any involvement of SDM, literature published in other languages than in English excluded from this systematic literature review and meta-analysis.

Selection of the studies PRISMA guidelines (Page et al. 2021), were followed for the screening of the literature, at first stage four individual authors screened titles and abstracts of the included studies after removing the duplicates from retrieved studies, then same others repeated the second stage of screening to find out the relevant studies to the study question by examining the full text of each article. By adopting the predetermined inclusion and exclusion criteria eligible studies incorporated in the final analysis.

Data-collection A pre-structured data grid was prepared by collaborative discussion with all study contributing authors, then individual studies were examined to collect the desired data, this work has been done by two authors combinedly. Information related to the intervention i.e.mode of intervention, duration of intervention, health outcomes evaluated in

Fig. 1 Prisma Flow Chart



response to intervention, and type of trial, other general information related to studies including author details, year of trail conduction, location of the study conduction, sample size, type of psychiatric disorder, and few patients related demographic information were gathered.

Data-analysis All the statistical analyses was conducted by the Review Manager v5.3.5, the pooled estimation of patient satisfaction between the SDM intervention and usual care measured with continuous outcome reported by individual studies with random effect model, standard mean difference along with inverse variance measurement. By considering heterogeneity random effect models were used for final pooled estimation with 95% CI, along with significance of $p\ 0.05$. Sub-group analysis also attempted to find out find out the outcomes at various level patients' groups. The sub-group analyses were conducted by considering the length of the intervention, by the region where the study was conducted, tools used for measuring the outcome, electronic based intervention vs others, and components in the intervention (i. e decision aid, decision-supporting tool, shared care planning).

Methodological quality assessment The Cochrane Collaboration's Risk of Bias tool was used for measurement of the methodological quality of the included studies. It contains six domains of measurement involving the sequence generation, allocation sequence concealment, blinding of participants and personnel, blinding of outcome assessment, incomplete outcome data, and selective outcome reporting with three option that high, low and, unknown. Three individual authors assessed the quality of each manuscript

the consensus was reached with discussing the individual reviewer's inputs.

Results

Study characteristics of involved rcts

Seventeen studies were involved in the final systematic literature review and meta-analysis and their characteristics were mentioned in Table 1, all these studies were published between the time period of 2006 to 2023, most of the studies published after 2015. The sample size in all the studies ranges from 14 as lower (Paudel et al. 2018) and 451 as higher (Priebe et al. 2007) among all RCTs. Out of seventeen studies five studies have dominant male participants (Woltmann et al. 2011; Moncrieff et al. 2016; Bauer et al. 2006; MacInnes et al. 2016; Pérez-Revuelta et al. 2023), others have larger number of female populations. Each study populations aged average around 40 years, most of the studies included the patients with schizophrenic related disorders. Few studies conducted in the European (Priebe et al. 2007; Van der krieke et al. 2013; Moncrieff et al. 2016; Hamann et al. 2011, 2020; Pérez-Revuelta et al. 2023), USA (Woltmann et al. 2011; Le Blancc et al. 2015; Paudel et al. 2018; Langer et al. 2022), and Asian region (Aljumah and Hassali 2015; Yamaguchi et al. 2017). All studies used usual care as comparator except one study (Bauer et al. 2006). Highest number of studies used CSQ tool alone (Priebe et al. 2007; Yamaguchi et al. 2017; Moncrieff et al. 2016; Ishii et al. 2017), the duration of exposure to the intervention ranging from 1 day to 12 months, almost mixed type of components was involved in the intervention. Almost all the studies involved mental healthcare providers and their peers for the implementation of SDM intervention.

Characteristics of intervention

There were various names given to the intervention in most of the studies mentioned in Table 2. Most of the studies designed their interventions as decision supporting and coaching tools with face to face, paper based, smartphone apps or electronic, and interactive workshop formats for duration ranged from 1 day to 12 months. The highest number of patients involved were out-patients.

Results of methodological bias assessment

The risk for bias assessment was conducted by the Cochrane Collaboration's Risk of Bias tool. Each studies quality evaluation results presented in Table 3. It showing most of the included studies reported bias at the blinding of participants and personnel, and outcomes assessment.

Overall effect size for impact of shared decision-making intervention on patients' satisfaction

A total of Ten studies included in meta-analysis with population $N = 1215$. The results of pooled analysis with 95% CI were represented in Fig. 2, the random effect model revealed that the concept of SDM as intervention shown a significant effect on the overall patient's satisfaction regarding their care (SMD) = 0.33, CI: 0.02, 0.57, $p = 0.04$), with showing heterogeneity across the trails ($chi^2 = 53.13$, $p < 0.01$, $I^2 = 83\%$).

Sub group analysis

The sub-group analysis was carried out to find influencing factors for patients' satisfaction with intervention, for this the duration exposed to intervention, region of study conduction, dominant population across the studies, tools used for the measurement of outcome, type of intervention, and components of the intervention were considered. Patients those exposed to the intervention > 3 months illustrates significant effect of SDM on patients' satisfaction (SMD) = 0.47, CI: 0.06, 0.88, $p = 0.03$) in comparison to those with < 3 months of duration of exposure (SMD) = 0.19, CI: -0.36, 0.73, $p = 0.50$) with significant heterogeneity among both groups ($chi^2 = 29.99$, $p = 0.00$, $I^2 = 87\%$) in < 3 months group, ($chi^2 = 20.69$, $p = 0.00$, $I^2 = 81\%$) in > 3 months group (Fig. 3).

The subgroup analysis of the region (Fig. 4) where studies was conducted shown heterogeneity with random effect model among European countries ($chi^2 = 30.18$, $p = 0.00$, $I^2 = 83\%$), not in Asian countries ($chi^2 = 1.50$, $p = 0.00$, $I^2 = 0\%$). The pooled estimation of satisfaction was non-significant among European (SMD) = 0.20, CI: -0.19, 0.59, $p = 0.32$), Asian countries (SMD) = 0.13, CI: -0.09, 0.36, $p = 0.25$). Along with this male dominant population studies, female dominant studies also resulted with non-significant effect on patients' satisfaction with intervention (SMD) = 0.65, CI: -0.07, 1.37, $p = 0.07$), (SMD) = 0.03, CI: -0.25, 0.31, $p = 0.82$) (Fig. 5).

The sub group analysis of tools used for measurement (Fig. 6), those analyzed by using CSQ tool shown a significant impact on patients' satisfaction (SMD) = 0.19, CI: 0.02, 0.35, $p = 0.03$) with minimal heterogeneity across the trails ($chi^2 = 2.44$, $p = 0.00$, $I^2 = 0\%$). Studies which were electronic based (Fig. 7) have shown positive association of SDM intervention as with usual care procedure (SMD) = 0.50, CI: 0.02, 0.99, $p = 0.04$) with significant heterogeneity ($chi^2 = 42.16$, $p = 0.00$, $I^2 = 88\%$), where non-electronic based interventions

Table 1 General characteristics of involved studies

First author	Objective	Sample size	Proportion of Men population	Age (Mean, SD)	Population in intervention group	Type of disorder	Location of the study	Comparator	Tools used for measurement	Type of RCT's
Aljumah and Hassali 2015	A pharmacist-based intervention related shared decision-making on medication adherence and other outcomes	220	Both groups-45.4%	Not clear	110	Depression	Saudi Arabia	Usual pharmacy services	TSQM tool	A prospective randomised controlled stud
Woltmann et al. 2011	Electronic decision support systems (EDSSs) trial for feasibility of shared decision-making and its association on the outcomes	80	Intervention-62.5%, Control-70%	Intervention-47 (9), Control-46 (11)	40	Schizophrenia or schizoaffective disorder, bipolar disorder, Major depressive disorder, posttraumatic stress disorder, andOthers	USA	Usual treatment services	Case-manager satisfaction and client satisfaction questionnaire	A cluster randomized control trail
Priebe et al. 2007	To test a computer-based procedure (DIALOG) and its impact on quality of life and other health related outcomes	451	Intervention-31.7%, Conrol-44.3%	Intervention-43.8 (1.2), Control-43.8 (1)	243	Undifferentiated schizophrenia, Paranoid schizophrenia, Catatonic schizophrenia, Hebephrenic schizophrenia Hebephrenic schizophrenia, Schizoaffective manic, Schizoaffective depression (moderate and severe), Schizoaffective bipolar disorder, Delusional disorder	Spain	Usual treatment services	CSQ tool	A cluster randomised controlled trial

Table 1 (continued)

First author	Objective	Sample size	Proportion of Men population	Age (Mean, SD)	Population in intervention group	Type of disorder	Location of the study	Comparator	Tools used for measurement	Type of RCT's
Yamaguchi et al. 2017	Effect of intervention (shared decision-making) through common ground approach on patient clinical and recovery related outcomes	53	Not clear	Not clear	26	Schizophrenia (70%) another psychotic disorder patients	Japan	Usual treatment services	CSQ tool	A pilot randomized controlled trial
Le Blancc et al. 2015	To study the effect of DMC on decision quality and other outcomes	297	Intervention-27.8%, Control-38.1%	Intervention-43.2(15.6), Control-43.9(15.1)	158	Depression	USA	Usual treatment services	Point Likert scale (satisfied / extremely satisfied)	A cluster randomized trial
Van der krieke et al. 2013	A web-based intervention to provide and evaluate shared decision-making along associated outcomes	73	Intervention-67.5%, Control-47.5%	Intervention-37(12.35), Control-40(13.47)	44	Schizophreniform disorder, schizoaffective disorder, schizophrenia, or psychotic disorder	Netherlands	Usual treatment services	COMRADE scale	An open-label, 2-group, parallel, randomized controlled trial
Moncrieff et al. 2016	To study the efficacy of Medication Review Tool to involve patients in decision-making	50	Intervention-74%, Control-69%	Intervention-45(10), Control-39(11)	31	Psychosis, schizophrenia, schizoaffective disorder, delusional disorder or a mood disorder with psychotic symptoms	London	Usual treatment services	CSQ tool	A pilot cluster randomised trial
Bauer et al. 2006	To study the effect of collaborative decision in bipolar disorder and its impact on health oucomes	306	Both groups-91%	Both groups-46.6 (10.1)	Not clear	Bipolar disorder, depression	NA	Usual treatment services	Not clear	Not clear

Table 1 (continued)

First author	Objective	Sample size	Proportion of Men population	Age (Mean, SD)	Population in intervention group	Type of disorder	Location of the study	Comparator	Tools used for measurement	Type of RCT's
Elbogen et al. 2007	To study the effects of implementing psychiatric advance directives to promote self-determination of treatment among people with mental illness	125	Both groups-41%	Both groups-44.8 (10.1)	Not clear	Schizophrenia, schizo-affective disorder, psychotic disorder, major mood disorder with psychotic features	North Carolina	Usual treatment services	Not clear	Not clear
Hamann et al. 2011	The Shared decision-making training for inpatients with schizophrenia	61	Both groups-38%	Both groups-40.7 (11.7)	32	Schizophrenia, schizoaffective disorder	Germany	Usual treatment services	ZUF8 Questionnaire	A pilot randomized clinical trial
Paudel et al. 2018	To evaluate a low tech SDM program in a non-academic community mental health centre and associated outcomes on decisional certainty and satisfaction with care	14	NA	NA	Not clear	Severe and persistent mental illness	USA	NA	four questions consisted questionnaire	Not clear
Ishii et al. 2017	To study the feasibility and efficacy of shared decision making for first-admission schizophrenia	22	Intervention-27.7%, Control-49.2%	Intervention-41.6(13.6), Control-37.4(9.8)	9	Schizophrenia, schizotypal, and delusional disorders	Japan	Usual treatment services	CSQ tool	A Randomized, parallel-group, two-arm, open-label, single-centric design
Ed Brooke-Childs et al. 2019	To test the effectiveness of a smartphone app with young people to support shared decision making	64	Not clear	Not clear	28	Unclear – Children and young people from 8 Child mental health services	UK	Usual treatment services	Not clear	A cluster randomized controlled trial

Table 1 (continued)

First author	Objective	Sample size	Proportion of Men population	Age (Mean, SD)	Population in intervention group	Type of disorder	Location of the study	Comparator	Tools used for measurement	Type of RCT's
MacInnes et al. 2016	To establish the feasibility of the trial design that involved shared decision-making	112	Intervention-85%, Control-85%	Intervention-36(10), Control-34(11)	55	Schizophrenia and Schizoaffective disorders and other mental health disorders	UK	Usual treatment services	FSS Scale	A pilot cluster randomised controlled trial
Pérez-Revuelta et al. 2023	To study the efficacy of SDM with booster sessions to increase adherence to antipsychotic treatment in patients with schizophrenia	102	Intevention-78%, Control-68.63%	Intervention-40.22 (10.78), Control-44.23 (11.07)	51	Schizophrenia spectrum disorder, schizoaffective disorder, Schizophrenia, Mental health disorders	Spain	Usual treatment services	COMRADE scale	A Single blind randomized controlled clinical trial
Langer et al. 2022	To evaluate shared decision-making (SDM) to plan youth psychotherapy	40	Intervention-40%, Control-50%	Intervention-11.3 (2.54), Control-10.6 (2.56)	20	Major depressive disorder, dysthymic disorder, generalized anxiety disorder, separation anxiety disorder, social phobia, or specific phobia	USA	Usual treatment services	SWD scale	A multi-centre, matched-pair cluster randomised controlled trial
Hamann et al. 2020	To evaluate the effects of SDM-PLUS on decision-making patterns on acute psychiatric wards between psychiatrists and patients with schizophrenia	257	Intervention-48%, Control-53%	Intervention-42.1 (12.9), Control-41.4 (13.6)	27	Schizophrenia or schizoaffective disease	Germany	Usual treatment services	ZUF8 Questionnaire	A Cluster randomised controlled trial

Table 2 Characteristics of intervention and study results

Name of the intervention	Components	Format	Duration	Type of interventionist	Clinical setting	Type of outcome (mean, SD) (IG, CG)	
SDM pharmacist intervention	Decision support tool	Unclear	3 months	Pharmacist	Out-patients	83.20 (11.42)	82.54 (13.41)
EDSS	Shared care planning	Electronic based and face to face	3 months	Mental health provider	Out-patients	04.00 (00.50)	03.30(00.50)
DIALOG	Shared care planning	Electronic based and Face to face	12 months	Mental health provider	Out-patients	25.99 (04.22)	25.15 (04.30)
SHARE	Decision support tool	Electronic	6 months	Mental health provider	Out-patients	26.04 (04.40)	24.30 (04.76)
DMC	Decision aid	Paper	1 day	Primary care clinician	Primary care	NA	NA
WEGWEIS	Decision support tool	Electronic	6 weeks	Mental health provider	Out-patients	NA	NA
Medication Review Tool	Decision support tool	Web-based and paper	1 day	Mental health provider	Out-patients	27.00 (05.00)	28.00 (05.00)
BDP	Decision coaching tool	Face to face	3 years	Mental health provider	NA	NA	NA
F-PAD	Decision coaching tool	Face to face and paper	1 day	Research assistant	Out patients	NA	NA
SDM Training	Decision coaching tool	Face to face	5 days	Mental health provider	In patients	25.50 (04.10)	26.70 (03.20)
BSDMM	Decision coaching	Face-to-face	12 weeks	Mental health provider and peers	NA	NA	NA
SDM model program	Shared care planning	Face to face	6 months	Independent supervisor	Out patients	23.70(03.90)	22.10 (03.70)
Smart phone app	Decision support tool	Smartphone based service (Power up)	3 Months	Mental health provider	NA	02.65 (00.49)	02.62(12.00)
DIALOG	Decision coaching tool	Face to face and electronic	12 months	Mental health provider and peers	Out patients	03.30 (00.30)	03.03 (00.10)
SDM model program	Decision aid	Face to face	12 months	Mental health provider and peers	NA	104.08 (80.00)	93.45 (20.30)
SDM model program	Decision support tool	Face to face	Not clear	Mental Health provider	NA	NA	NA
SDM-PLUS	Decision support tool	Interactive workshops	12 months	Mental Health provider	In patients	NA	NA

had non-relevant findings (SMD) = 0.04, CI: -0.35, 0.43, $p = 0.84$). The sub group analysis of the various components of the intervention (Fig. 8) including shared care planning (SMD) = 0.66, CI: -0.18, 1.51, $p = 0.13$), decision supporting tool (SMD) = 0.08, CI: -0.09, 0.26, $p = 0.36$), decision coaching tool (SMD) = 0.45, CI: -1.05, 1.95, $p = 0.55$) shown no significant association with satisfaction with care.

Narrative synthesis of results

About seven of the seventeen research studies were included in the narrative synthesis due to data that was not appropriate for performing a meta-analysis. Most of the trials yielded beneficial findings for the intervention, suggesting that those individuals exposed to it experienced more feeling satisfied. In a study conducted by participants with psychosis at a Dutch mental institution who had access to web-based information and decision aids reported higher levels of satisfaction with communication ($\bar{x} = 38.25$ (± 1.06) and confidence in decision-making ($\bar{x} = 38.78$ (± 1.17) compared to those in the control group (Van der krieke et al. 2013). Patients were 1.64 times more satisfied (satisfied to highly satisfied) with their care, according to the final findings of another trial that used depression medication choice (DMC) as an intervention to promote decision-making (Yamaguchi et al. 2017). Most older patients and their parents were the focus of earlier SDM interventional studies, but Langer were the first to develop a shared care plan implementation protocol for youth psychiatric patients, and they also found that young patients were more satisfied with the decisions made during clinical encounters (Langer et al.

Table 3 Results of methodological bias assessment

Study name	D1	D2	D3	D4	D5	D6	D7	D8
Aljumah and Hassali 2015	Low	Low	High	Low	Low	Low	Low	Unclear
Woltmann et al. 2011	Unclear	Unclear	Unclear	High	High	Not applicable	High	High
Priebe et al. 2007	Low	Low	High	High	High	High	Low	High
Yamaguchi et al. 2017	Low	Low	Low	High	High	High	Low	High
Le Blancc et al. 2015	Low	Low	Low	High	High	Unclear	High	Low
Van der krieke et al. 2013	Low	Low	High	High	High	Unclear	High	Low
Moncrieff et al. 2016	Low	Low	Unclear	High	High	High	Low	High
Bauer et al. 2006	High	High	High	High	Low	Low	Low	Low
Elbogen et al. 2007	High	Unclear	Low	High	High	High	Low	Low
Hamann et al. 2011	Low	Low	Unclear	Low	High	Low	Low	Unclear
Paudel et al. 2018	High	Low	Unclear	High	High	High	Low	Low
Ishii et al. 2017	Low	Low	Low	High	Unclear	High	Low	Low
Ed Brooke-Childs et al. 2019	Low	Unclear	Low	High	High	Low	High	High
MacInnes et al. 2016	Low	Low	High	High	High	Low	High	Low
Pérez-Revuelta et al. 2023	Low	Low	Low	Low	Unclear	Unclear	Low	High
Langer et al. 2022	Low	Low	Unclear	High	High	Unclear	Low	High
Hamann et al. 2020	Low	Low	Low	High	High	High	Low	Low

D1- Random sequence generation
D2- Allocation concealment
D3- Selective reporting
D4-Blinding of participants and personnel
D5-Blinding of the outcome (subjective outcome)
D6-Blinding of the outcome (objective outcome)
D7-Attribution bias
D8- Other source of bias

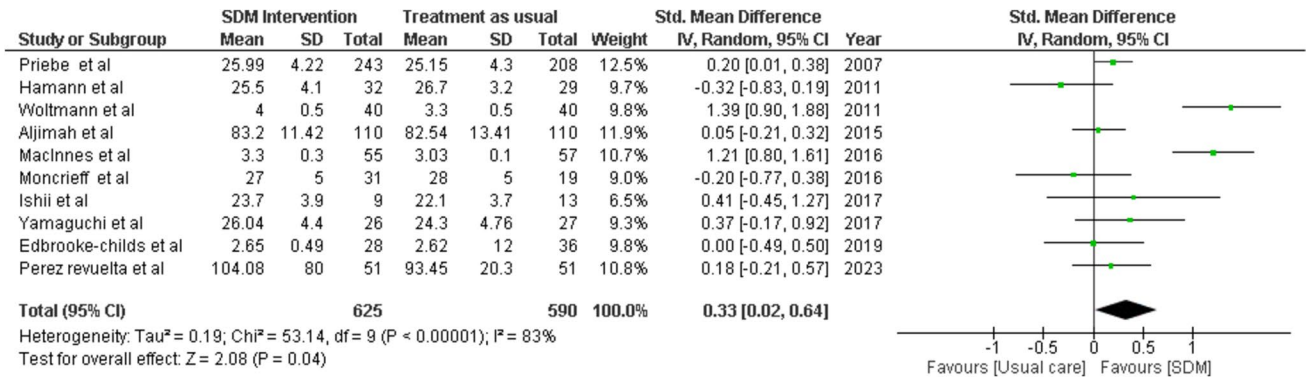


Fig. 2 Forest plot for overall patients' satisfaction with SDM intervention

2022). Additionally, Hamman's SDM-PLUS (patients' training) tool demonstrated a 3.05-fold increase in experience with higher-quality care (Hamann et al. 2020). The same authors conducted a different investigation in 2011 and found a different result. The interventions are likewise supported by the remaining studies (Hamann et al. 2011).

Discussion

Patients' satisfaction is one of the outcomes that gives how the patients feel regarding their experiences during stay in hospital, that also provide an outline picture of how the quality care was providing in the hospitals. SDM is one of the concepts that engages the patients in care procedure,

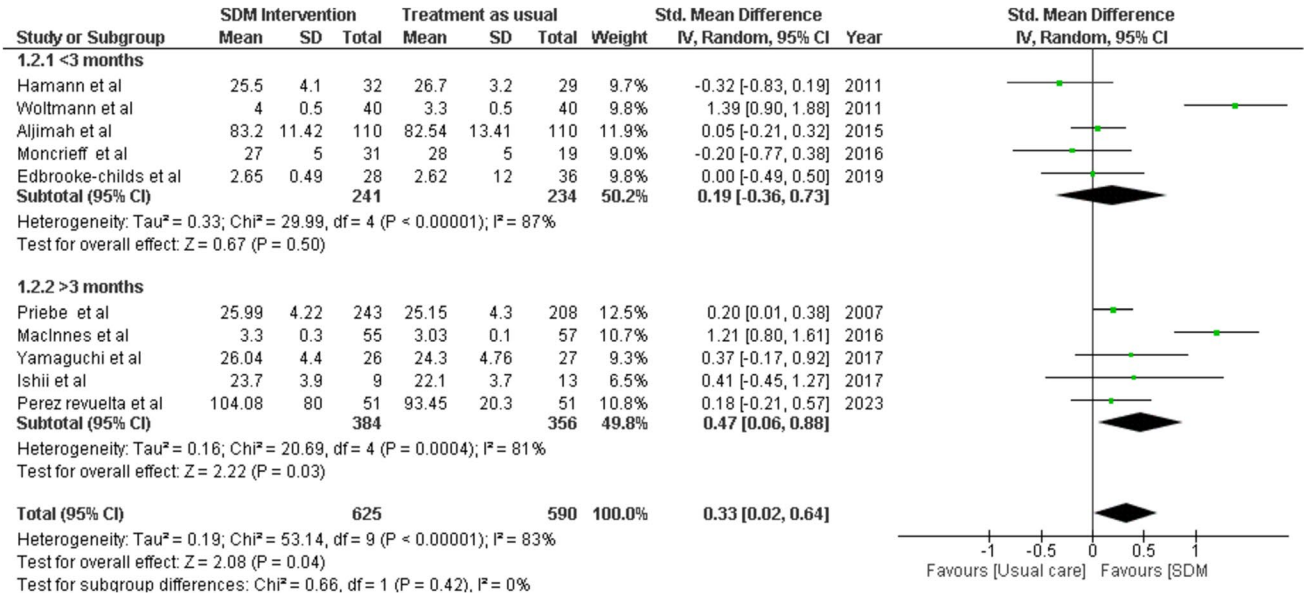


Fig. 3 Forest plot for patients' satisfaction by duration of intervention

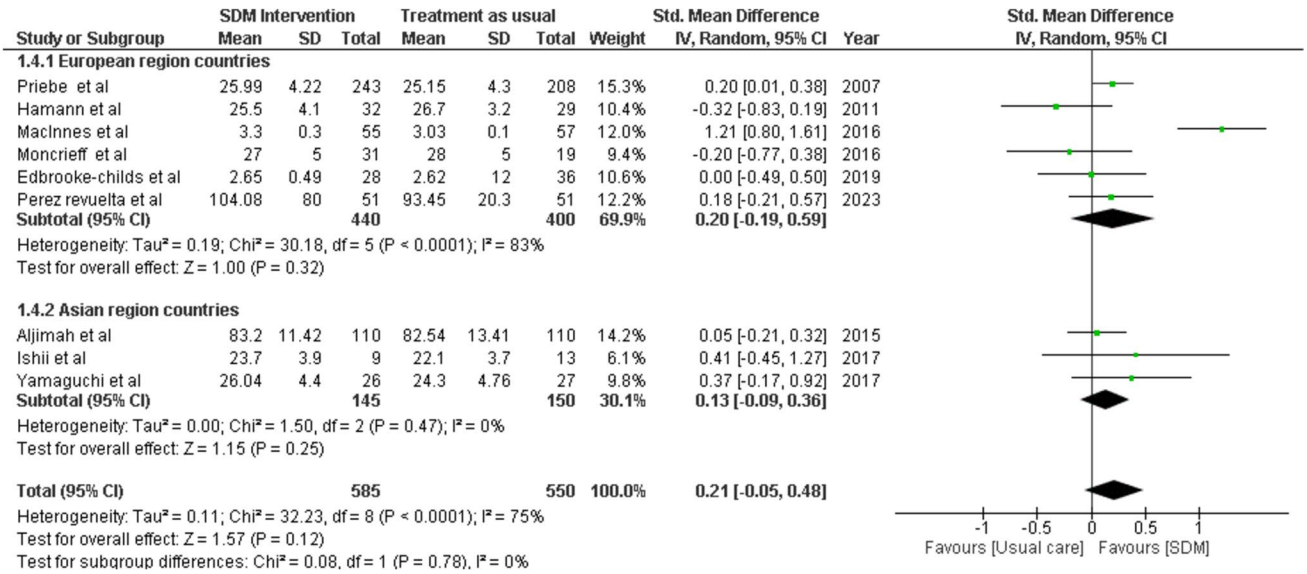


Fig. 4 Forest plot for patients' satisfaction based on region of study conduction

will automatically leads to betterment of patients' satisfaction. So, this study aimed to evaluate influence of SDM as an intervention on patients care satisfaction.

This is the first study evaluated the SDM intervention influenced patients care related fulfilment. The overall pooler effect size revealed SDM influences the patient's satisfaction in a positive way, these findings were in the same line with other previous studies and meta-analysis where they tested only digital interventions (Suh and Lee 2010; Hölzel et al. 2013; Vitger et al. 2021), few studies have reported mixed results on the impact of SDM on patients' satisfaction (Zisman-Ilani et al. 2017; Aoki et al. 2022) [23, 24]. At sub group analysis patients who exposed to the intervention > 3 months found as significant influencing factor in this study where other studies found no significant association (Vitger et al. 2021) [18] but in comparison those study findings were have less have heterogeneity.

Studies conducted in various regions did not show any correlation with how the patients satisfied with care, three studies included under the category of Asian region studies

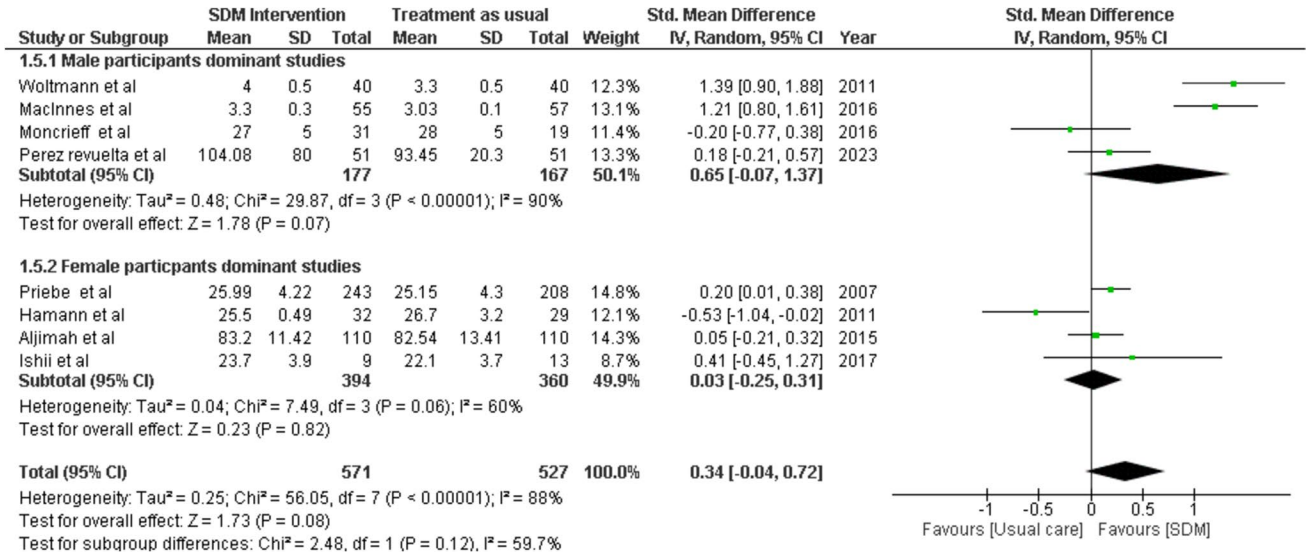


Fig. 5 Forest plot for patients' satisfaction based on dominant participants

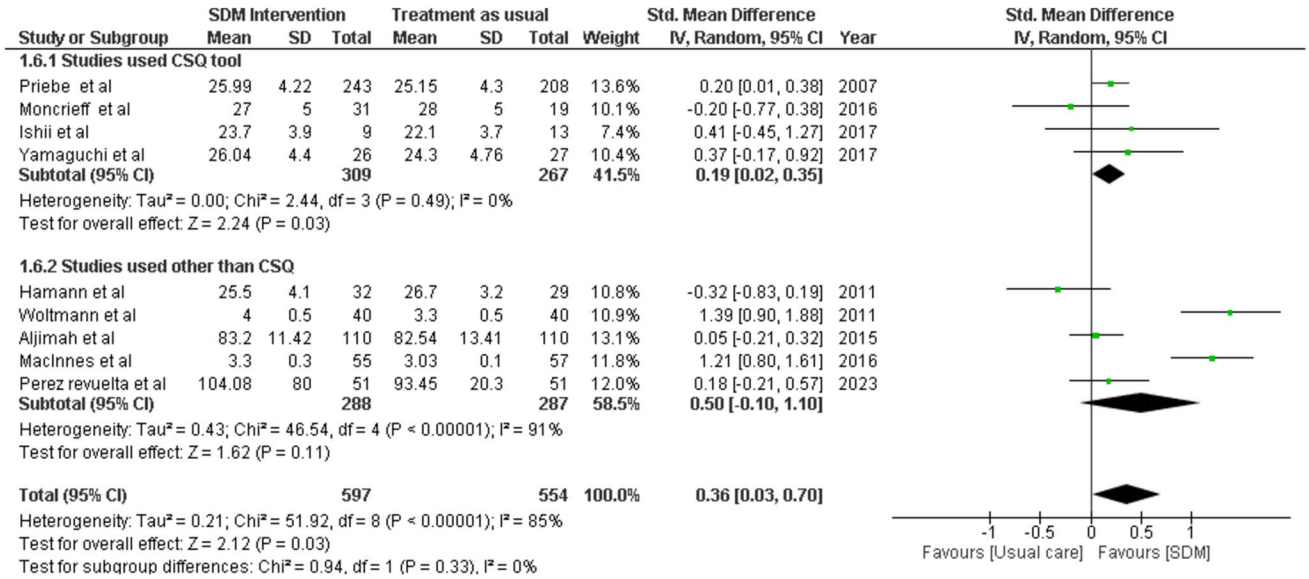


Fig. 6 Forest plot for patients' satisfaction based on tools used for measurement of outcome

among them Aljumah et al. was conducted at Saudi Arabia, individually this study reported an insignificant influence (SMD) = 0.19, 95% CI: 0.02, 0.35 of SDM intervention, but an observational study in 2020 found that Saudi Arabian patients were shown better experience of patients' involvement in clinical setting (Alrawiai et al. 2020), other involved studies also showing the same results. Six studies were involved from European region under this meta-analysis among them individually two studies Priebe et al. (SMD) = 0.20, 95% CI: 0.01, 0.38 and MacInnes et al. (SMD) = 0.21, 95% CI: 0.80, 1.61 were revealed significant influence of patients' satisfaction, rest of the included studies found with non-significant results. This was may be due to the less differentiation among scores between intervention group and control group. The studies used CSQ tool showed significant outcome on final pooled analysis than other tools, so in further studies using the CSQ tool may give better results about the outcome.

A total of eight studies came for eligibility for meta-analysis, both male and female dominant individual studies reported a non-significant finding under this study, out of eight studies four studies have male dominant participants but only two studies shown a significant result with those involved in SDM. In female a single study was found

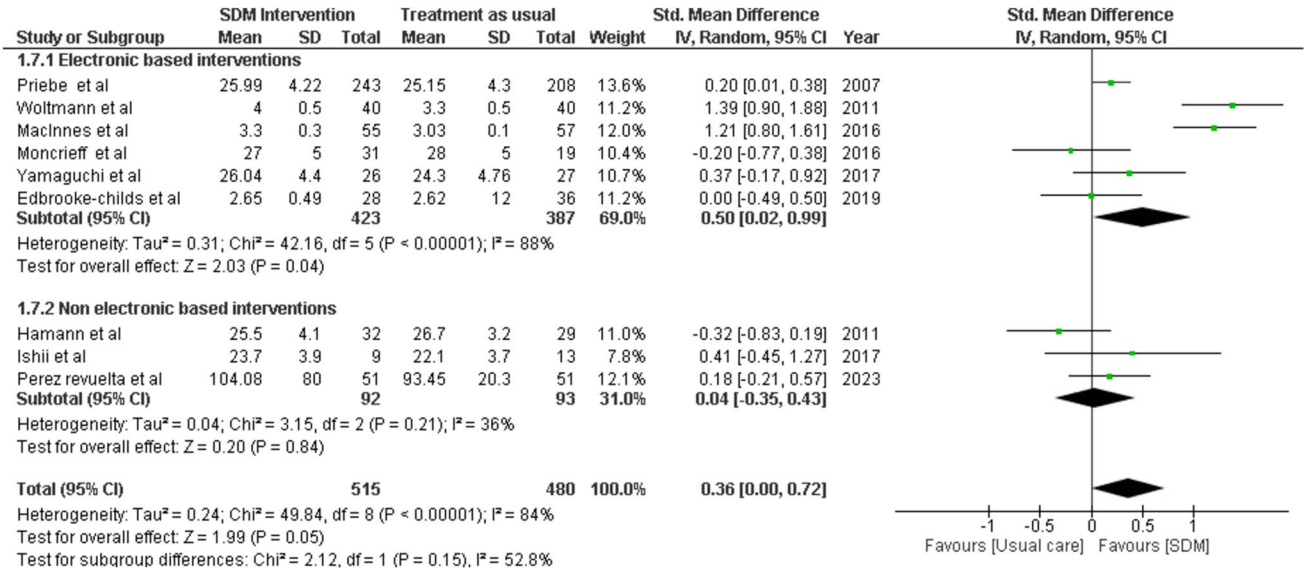


Fig. 7 Forest plot for patients' satisfaction based on type of intervention (Electronic vs non-electronic)

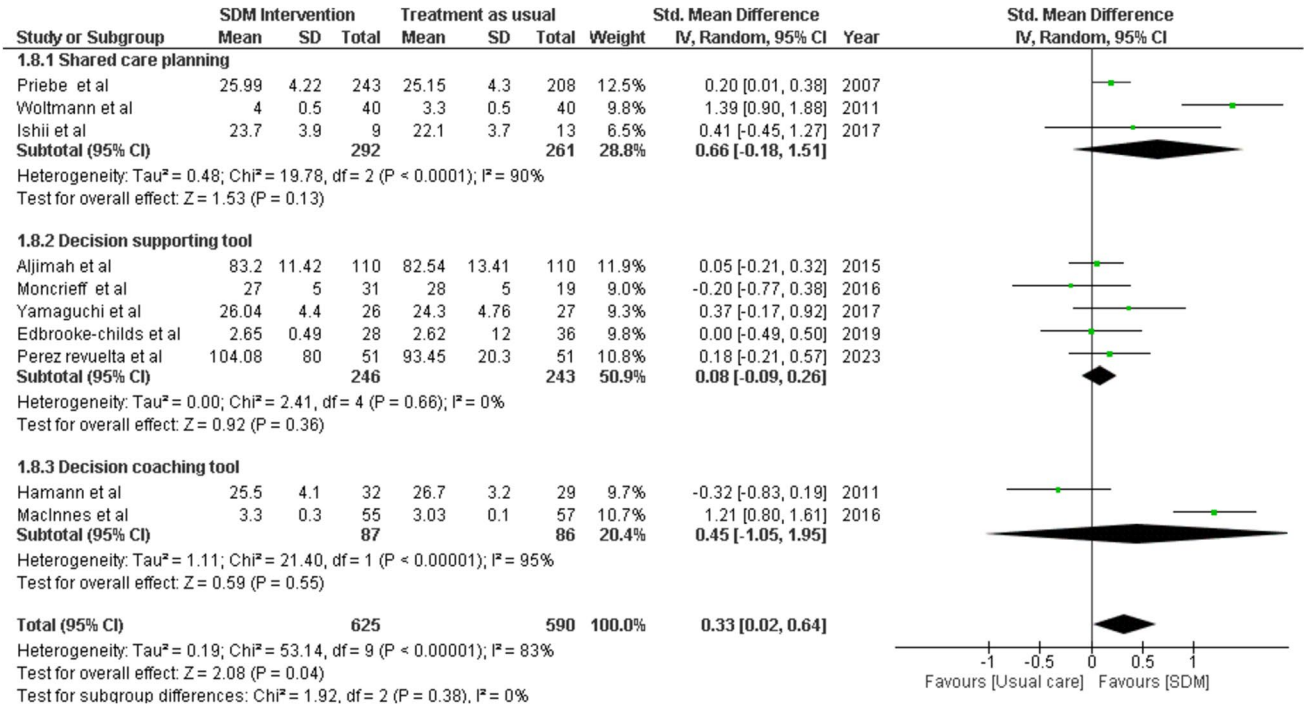


Fig. 8 Forest plot for patients' satisfaction based on type of intervention

with better results words patients' satisfaction. The overall findings reveal gender does not play any important role to influence outcome. Electronic based interventions significantly influenced the patients' level of satisfaction with the treatment and decisions they made in the clinical settings in contrast to other study findings (Vitger et al. 2021) [18]. Participants with based on the type of intervention including shared care planning, decision supporting tool, and decision coaching tool shown a non-significant result, among them mixed results were obtained at individual study level with decision coaching tool at individual study level.

Limitations

The lack of factors impacting the final effect size prevented us from performing sensitivity analysis, and publication bias was not taken into consideration because there were fewer papers examining more than one outcome. There are too many different components in the intervention for us to conduct a subgroup analysis based just on the components.

Conclusion

This study results found the SDM as an intervention have a positive associated effect on the patient's satisfaction among mental healthcare, and few important influencing factors were also reported in the subgroup analysis.

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Authorship contribution **Pavan Kumar Narapaka:** Conceptualization, Data Retrieval, Screening & Data extraction, Roles/Writing- original draft and Writing—review & editing. **Sunitha Kaduburu:** Data Retrieval, Screening & Data extraction. **Ramadevi Obulapuram:** Screening & Data extraction, Roles/Writing- original draft and Writing—review & editing. **Manisha Singh:** Data Retrieval, Writing—review & editing. **Krishna Murti:** Data Retrieval, Roles/Writing—original draft, Writing—review & editing.

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Data availability The dataset is available with the corresponding author and first author.

Declarations

Ethics approval As this is a systematic review and meta-analysis, ethical approval was not required.

Consent for publication All the authors evaluated and agreed with the final content.

Conflict of interest None.

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