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Occupational Therapy for Reducing Disabilities in Persons with Disabilities in India: A Systematic Review

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Abstract

Background—The current evidence for occupational therapy practice, teaching, and research is replicated and implemented significantly from high-income countries in India. Therefore, a systematic review and an evaluation of existing evidence for occupational therapy (OT) to reduce disabilities including impairments, activity limitations, and participation restriction in persons with disabilities (PWD) in India are warranted.

Objectives—The objective of this review was to evaluate the effectiveness of OT interventions for reducing disabilities in PWD in India.

Study Design—Systematic review.

Methods—We searched the Cochrane CENTRAL, MEDLINE, Embase, CINAHL, PsycINFO, AMED, and Web of Science. A hand search was also carried out in selected Indian journals, OT-specific databases, and repositories, such as *Indian Journal of Occupational Therapy*, *Indian Journal of Physiotherapy and Occupational Therapy*, OT Seekers, World Federation of Occupational Therapy Bulletin, Asia Pacific Occupational Therapists Regional Group, and clinical trials registers. The search was restricted to published studies conducted in India during 2000–2021. We included randomized controlled trials (RCTs) of an occupational therapy intervention

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Conflicts of Interest
There are no conflicts of interest.

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delivered by OTs for PWD, where the effects of the intervention were evaluated using any relevant disability outcome measure. Studies without access to full text were excluded. Two review authors independently completed screening, and one author reviewed the full text of the screened studies. Another pair of authors extracted data from included studies for prespecified disability outcomes, and two authors assessed the risk of bias in the included studies.

Results—We identified seven RCTs of occupational therapy interventions for PWD in India with 305 participants in total. All seven studies were very different in terms of their objective, participants, comparison, and outcomes. Allocation concealment and blinding and risk of bias were high in five trials. All the trials reported impairment outcomes with a statistically significant difference between the experimental arm and the control arm in terms of their primary outcomes except one. Given the sample size and the risk of bias in each of the included trials, the effect size has to be understood and interpreted with utmost caution.

Conclusion—Overall, this review establishes the paucity of evidence for occupational therapy for PWD in India. Building the capacity for rigorous and relevant scientific research in occupational therapy would enable bridging the gaps in evidence for occupational therapy in India.

Keywords

Disabilities; Evidence; Occupational Therapy; Randomized Controlled Trial; Systematic Review

Introduction

Description of the Condition

Disability is a complex process describing the interaction between an individual with a health condition and the environment.[1] It is an umbrella term that includes impairment, activity limitation, and participation restriction experienced by individuals with a health condition within their environment.[2] The prevalence of disability globally is estimated to be about 15%, and in India, it is estimated as 2.2%. Nearly 26.8 million people are estimated to have a disability according to the Census of India in 2011.[3] These estimates are considered to be much higher at this new decade of the 21st century because of the demographic and epidemiological transitions since 2011 in India.[4] The magnitude of disability in India is an important public health problem, especially because there are no organized systems in place to meet the rehabilitation needs of people with disabilities.[5] Much of the rehabilitation services are unidisciplinary, driven by a medical doctor and physiotherapist at best if a team approach is offered.[6] Even these services are comprehensively available only in private hospitals or rehabilitation centers located in major cities and urban areas.[7] Given the situation, the demand and unmet need for reducing disabilities in India are increasing exponentially.[8]

Description of the Intervention

Rehabilitation is a team effort.[9] Occupational therapy interventions (OTIs) and occupational therapists (OTs) are an integral and crucial part of the rehabilitation processes.[10] This is especially true because the focus and goal of any OTIs are solely toward

functional independence of persons with disabilities (PWD) in activities of daily living (ADL) and in performing their individual, family, and social roles within an environment.[11] Strategies used by OTs include assessment, treatment, adaptive techniques, assistive technology, and environmental adaptations.[11]

How the Intervention Might Work?

The fundamental aspects of occupational therapy (OT) for PWDs will include the following.

Assessment—OTs assess PWDs to understand the problems experienced by PWDs. The assessment will include all the domains of the International Classification of Functioning, Disability, and Health (ICF) such as impairments, activity limitations, participation restriction, and the physical, social, and psychological environment of an individual experiencing a health condition.[12] They assess the impact of the health condition to independently initiate, sustain, and complete their ADL and fulfill their life roles. Any OT assessments are intended to be used to analyze how PWDs can perform their ADL. The results of the assessment are used to create a therapy plan.[10-12]

Teamwork—OTs work closely with the PWDs and their family. The core members of any rehabilitation team decide the goals to achieve and the therapeutic interventions relevant and appropriate to achieve the goals.[11]

Intervention plan—The OTs develop a specific intervention plan that will encompass all activities essential to achieve recovery and enable improvement in performance for a PWD who gets treated. The intervention plan will incorporate specific short-term and long-term goals, therapy approaches, and a framework that will be applied to achieve the set goals.[11] The entire OTI plan is based on the prioritized needs of the PWD, the clinical judgment of the therapists, and the best available evidence. OTIs are selected based on the appropriateness, needs, purpose, and resources available. The goals are developed to monitor progress and also to evaluate the effectiveness of the therapy to achieve the set goals.[11]

Occupations as a Therapeutic Medium and Goal

OTs use an individual's daily occupations, such as activities of everyday living that an individual performs as a means to achieve therapeutic improvement and the intended goal in their occupations of interest.[11]

Evaluation and Accountability

The effectiveness of the OTIs provided by the OTs to PWDs is evaluated periodically and the OTs are expected to assume accountability for achieving the outcomes, as per the national and global standards for practice.[11]

Why It Is Important to Conduct This Review?

In India, there are only three OTs per 10,000 population as opposed to doctors and nurses (26 per 10,000 population).[13] Even the number of doctors and nurses in India is considered to be substantially low to meet people with healthcare needs.[14] High-income countries have realized the importance of this science to empower PWDs. For example, in the

United Kingdom, the number of OTs has increased from 320/10,000 people in 2010 to 520/10,000 people in 2020.[15] These numbers when compared to India are extremely high.[13,15] In the second-most populous country in the world with an estimated 26.8 million PWD, which is close to the entire size of the population of certain countries in the world, the need for OTIs and services is expected to be substantial and unmet. In India, PWDs have poor access to OTs and OTIs which can help in reducing their disabilities and enhance functional independence.[16] Given these challenges, it is all the more crucial to understand the evidence-based and effectiveness of OTIs for PWDs in India. This would enable policymakers, practitioners, and researchers in the field of OT and rehabilitation, in general, to develop strategies to strengthen the existing health systems.[17] It would enhance safe and effective occupational therapy service provision to PWDs and prevent unethical, nonevidence-based practices that could harm PWDs.[18]

Objectives

The objective of this review was to evaluate the effectiveness of occupational therapy interventions for reducing disabilities in PWD in India.

Methods

We followed the Cochrane guidelines (handbook version 6.1) to conduct a systematic review of RCTs.[19]

Criteria for Considering Studies for This Review

Type of Studies—We sought all types of RCTs of PWDs receiving OTIs provided by OTs to reduce disabilities in India. We included published studies conducted in India during January 2000 to January 2021.

Type of Participants—We included RCTs that recruited persons with all kinds of disabilities, irrespective of their age, sex, and severity of the disability. We followed the ICF framework for characterizing disability. We excluded RCTs that did not recruit PWDs in at least one arm of the trial.

Types of Interventions—We included all trials of OTIs as defined by the American Occupational Therapists Association, “Occupational therapy interventions facilitate engagement in occupation to enable persons to achieve health, well-being, and participation in life. Occupational therapy intervention types include occupations and activities, interventions to support occupations, education and training, group interventions, and virtual interventions.”[20]

According to this definition, OTI will fall under any one or more of the following categories.

1. Treatment focused on reducing disabilities as defined by the ICF
2. The use of adaptive or compensatory techniques.
3. The use of assistive technology

4. Environmental adaptations in which the physical environment of the PWDs is modified.

We included RCTs where OTs delivered the OTIs. In an Indian context where there is no regulatory framework currently, it is possible to deliver OTIs by people other than OTs or OT assistants, who may or may not have the required skills to perform OTIs.

Types of Outcome Measures—The review was focused on outcomes that evaluated whether OTIs can reduce disabilities, including impairments, activity limitations, and participation restriction as a primary outcome. We included RCTs that evaluated the outcomes using any relevant outcome measure as there are not many standardized outcome measures to assess the Indian population. We included RCTs that reported any disability-related secondary outcomes.

Search Methods for Identification of Studies

We searched the Cochrane Central Register of controlled trials (The Cochrane Library, January 2021).

Electronic Searches—We searched the following electronic databases:

- Cochrane CENTRAL (2000 to January 2021)
- MEDLINE (2000 to January 2021)
- Embase (2000 to January 2021)
- CINAHL (2000 to January 2021)
- PsycINFO (2000 to January 2021)
- AMED (2000 to January 2021)
- Web of Science (2000 to January 2021)
- Open Grey (2000 to January 2021).

The authors developed a MEDLINE search strategy with appropriate MeSH terms and adopted the MEDLINE strategy to other databases [Appendix 1: Search strategy].

Searching Other Sources—The authors expected that the electronic search would not provide many studies as most of the Indian journals are not indexed in the databases above. Hence, a thorough hand search was also carried out in selected Indian journals such as *Indian Journal of Occupational Therapy* (IJOT) and *Indian Journal of Physiotherapy and Occupational Therapy* (IJPOT); databases and websites such as OT Seekers, World Federation of Occupational Therapy (WFOT) Bulletin, and Asia Pacific Occupational Therapists Regional Group (APOTRG); and clinical trial registers. The search was restricted to published studies conducted in India during January 2000 to January 2021.

Data Collection and Analysis

Selection of Studies—The search results were downloaded with all titles and abstracts from electronic databases in Microsoft Excel software. Two review authors (MC and SK)

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ran the search in electronic search, and three review authors (SM, TM, and LS) searched other resources. Two review authors (TM and MC) screened the titles and abstracts. Any irrelevant reports and duplicates during the initial screening were removed by the reviewers. Full text of the records identified for inclusion in the screening was retrieved, and one review author (SK) completed the full-text screening. The results of the full-text screening were reviewed by three review authors (TM, SM, and LS) for eligibility assessment and final inclusion. Any disagreement was resolved by one review author at all the stages of the review (SK).

Data Extraction and Management—Two review authors (SM and LS) extracted data from the studies included in the review, and a third author (SK) reviewed the data extraction of all the included studies. A data extraction form was developed specifically for the review based on the Cochrane guidelines. All relevant details such as characteristics of included studies, data related to the conduct and the methods, as well as reporting of the RCTs within the included studies were extracted by the reviewers.

Assessment of Risk of Bias in Included Studies—We assessed the risk of bias in the included studies using the Cochrane "Risk of Bias" tool using RevMan version 5.4 Copenhagen: The Nordic Cochrane Centre, The Cochrane Collaboration. 2020[19] We assessed the methods used in each study to identify the strategies used to control any potential sources of bias. The assessment was specifically focused on selection bias (sequence generation and allocation concealment); performance bias (blinding of participants, personnel, and assessors); detection bias (outcome assessment); attrition bias (incomplete outcome data); reporting bias (selective outcome reporting); and other sources of bias. Given that the intervention is complex and heterogeneous, the participants and outcomes are very diverse. The review authors did not specifically plan for assessing treatment effects, handling missing data, and assessing heterogeneity, sensitivity, and subgroup analysis.

Data Synthesis—Given the scope of the review question and the expected heterogeneity in the included studies, we did not combine the data and conduct the meta-analysis of outcomes. Instead, we performed a narrative synthesis.

Results

We identified seven RCTs of OTIs for PWDs in India. The characteristics of the included studies are provided in Table 1.

Results of the Search

We screened 3309 references of which 3228 were from database searches and 81 were from other searches. After removing duplicates, the total references for screening were 2668. The first-level screening by title and abstract yielded 85 studies. All the 85 studies went through second-level full-text screening. We excluded 78 studies because they did not fulfill the eligibility criteria for the study concerning the participants, intervention, outcomes assessment, and study design. Therefore, we included seven studies for the review. The details of the search are provided in a PRISMA flowchart as shown in Figure 1.

Description of the Studies

All seven studies were very different in terms of their objective, participants, comparison, and outcomes [Table 1]. Two studies conducted by Arya included stroke survivors and the trial was conducted in a rehabilitation setting in Delhi.[21,22] One more trial was also conducted in New Delhi with children having cerebral palsy.[23] Two trials took place in Mumbai; one with Dequervain's tenosynovitis participants and one with preterm infants.[24,25] One trial was conducted in Gujarat with hand-injured participants and one in Chhattisgarh with participants who had mental and behavioral disorders following drug and substance abuse.[26,27] Two trials had participants who were children aged 3–8 years and 28–32 weeks.[23,25] All other trials had adult participants. The studies duration ranged from 3 months in Arora *et al.*, 2018 to 12 months in Arya *et al.*, 2020 and Arya *et al.*, 2015.[21,25]

OTIs evaluated in the trials were also very different from each other. All the trial interventions were a mix of OTIs with specialized techniques such as mirror therapy, constraint-induced movement therapy, oromotor stimulation, myofascial taping, biofeedback, computer game, and interlimb coupling. All the trials had varying duration and session plans for delivering the interventions. The duration of interventions also ranged from 30 min session for 6 days/week for 2 weeks to 40 sessions of 1.30 h duration for 8 weeks.[21,26]

Risk of Bias in Included Studies

The assessment of the risk of bias in the included studies in terms of the overall risk of bias across all included studies is summarized in Figure 2. The judgments about each risk of bias item for each included study are summarized in Figure 3.

Allocation-Sequence Generation

We judged all seven trials included in the review based on the method of sequence generation and found it to have a low risk of bias.[21-27]

Allocation Concealment

Three trials reported methods to ensure concealment of allocation, and we judged these as having a low risk of bias for this item.[21,23,25] We regarded the methods used in the other four trials as inadequate to ensure allocation concealment and judged them to have a high risk of bias.[22,24,26,27]

Blinding

Two trials reported methods clearly to ensure blinding of participants and personnel.[21,22] The methods used to ensure blinding of participants and personnel in the other four trials was inadequate. Therefore, we judged them to have a high risk of bias. The outcomes are likely to be influenced by the knowledge of the intervention arm to which the trial participants belong to these trials.[23,24,26,27] Methods of the trial were not explicit about blinding. Hence, it was rated as unclear risk of bias.[25] Blinding of outcome assessors were adequate and hence we judged them to have a low risk of bias in four trials.[21-23,25] The methods used in the other three trials were considered inadequate to ensure blinding of

outcome assessors. Therefore, review authors judged the blinding component of those trials to have a high risk of bias.[24,26,27]

Incomplete Outcome Data

We judged all the included trials to have a low risk of bias concerning incomplete outcome data because all trials reported dropout rates.[21-27] Details including the reasons for participants dropped out were also described adequately in all the trials.

Selective Reporting

Selective reporting was not identified in any of the included trials, and therefore, the trials included scored a low risk of bias. All the trials reported what was proposed to be evaluated.

Other Potential Sources of Bias

We did not identify any other significant potential sources of bias in five of the included trials.[22-24,26,27] The methods of the two trials were not clear because one trial recruited only male patients while another trial was a feasibility trial but explaining the effects of the intervention as the outcome.[22,27] These two issues may impact the generalizability of the trial findings and hence were rated unclear.

Effects of the Intervention

All the included trials reported a measure of the primary outcome. All the primary disability outcomes in the included trials were related to impairments as shown in Table 2. Only one trial mentioned functional assessment as a primary outcome but reported the impairment-related outcome as the primary outcome.[26] All the trials reported a statistically significant difference between the experimental arm and the control arm in terms of their primary outcomes except the trial by Ganjiwale *et al*. The outcome measures used in all the included trials were very different, and hence, the review authors did not combine the effects of the intervention and conduct a meta-analysis. However, given the sample size and the risk of bias in each of the included trials, the effect size has to be understood with utmost caution.

Discussion

About 26.8 million people were reported to be living with disability in India in 2011.[3] These numbers would have certainly increased in the past 10 years too. Subsequently, the demands and need for comprehensive rehabilitation services including occupational therapy are expected to increase.[16] This review provides a clearer picture of the evidence for occupational therapy for PWDs in India. In the past 20 years, we found only seven RCTs of OTIs for just 305 persons with different types of disabilities in the second-most populous country in the world, which is considered the global hub for clinical trials. None of the RCTs primarily had an objective to look at functional independence in ADL and performance of the individual, family, and social roles that form the core aspects of occupational therapy. None of the seven trials included in the review provided an unadulterated occupational therapy intervention that systematically developed and validated for PWDs in India. Included trials also did not use a nationally standardized occupational therapy or disability outcome measure. Finding from the review suggests that the focus

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of the existing occupational therapy research is primarily on managing impairments with specialized rehabilitation techniques combined with occupational therapy. It confirms the paucity of evidence for occupation-focused occupational therapy for PWDs in India. The available evidence, although shows statistically significant differences for amalgamated OTIs, needs to be methodologically understood with utmost caution. This is not because of the methodological flaws in the studies. The RCTs included in the review were conducted and reported following global standards [Supplementary Material 1: CONSORT checklist of the included trials].[28] However, the contextual application of occupation-focused occupational therapy in India lacks detail.

Registration of clinical trials in the Clinical Trial Registry of India (CTRI) is mandated in India. Except for one trial,[23] none of the trials included in this review were registered in CTRI. Registration with CTRI ensures scientific credibility, transparency, and research integrity. Similarly, it is very important to publish any RCT protocol before commencing the study to fully describe the proposed methods to ensure ethical and safety standards. None of the trials in this review had published a trial protocol.

RCT is a rigorous scientific research method to establish the evidence of effectiveness for any health intervention. Occupational therapy researchers must understand that randomizing participants to each of the treatment arms alone is not sufficient to qualify for a good-quality RCT. All three components (randomization, control, and conduct of the trial) are equally important in an RCT. The included trials reported everything about their trial [Supplementary Material 1: CONSORT checklist]. However, the actual conduct and the process were not transparently described. For example, how the allocation was concealed despite explaining to the participants that they may or may not get the special experimental intervention during the informed consent process. Patients will be interested to know what they receive as an intervention. If they are aware about it, they might disclose this during a casual conversation with other patients, and this might contaminate the outcome assessment and the study results.

Similarly, controlling for other factors that might influence treatment effectiveness in complex rehabilitation interventions is challenging.[29] It is very difficult to identify the exact component that influenced the treatment effectiveness in the included trials. There are too many variables such as intervention providers' experience, expertise, patient motivation, caregiver support, and personal and physical environmental barriers that need to be controlled in all the trial participants. All of these influence the accuracy of measurement effects. Although the included trials reported their results with statistical significance, none described how their trial intervention was the only reason for their observed effectiveness.

All the trials included in the review calculated the sample size for their trial, but they did not explain this sufficiently impacting the generalizability of the trial results. It is very difficult to generalize any trial results to a wider population, especially if the trial is conducted in one hospital setting with a typical set of patients who come to their rehabilitation facility.[29,30] For example, trials run in a private tertiary hospital rehabilitation facility will be different from trials run in a government rehabilitation facility. This urges occupational therapy researchers to recruit participants from a representative population rather than randomizing

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only those who come to their rehabilitation facility. This could enhance the generalizability of the findings.

In addition, one must also remember that the selection of outcome measure and the desired effect size expected in participants with specific severity of a disability are critical components of sample size calculation.[29,30] For example, accepting a large effect size (person with a severe disability will become a person with a very minimal disability) in a trial evaluated by even a self-reported outcome measure will provide a smaller sample while calculating. None of the trials described this relationship from a clinical significance perspective, except for one trial where the effect size was not statistically different.[26] Occupational therapy researchers must give due consideration to clinical significance also and report this aspect in their trials.

Overall, this review establishes the paucity of evidence for occupational therapy for PWDs in India. RCTs of interventions are at the top of the evidence pyramid in terms of quality. It is highly challenging to conduct RCTs of complex interventions such as OTIs, especially in a context like India with several sociocultural diversities.

Limitation

One of the biggest limitations was that there is not any indexed database in India that publishes OT research. We identified very limited studies from global electronic search in this topic. Indian databases such as Med Ind and the National Informatic Centre were nonfunctional. Hence, it was difficult to obtain comprehensive literature from global databases. Second, the Indian journals publishing occupational therapy research were not indexed in national library of medicine and access to the issues in their journal database was also restricted. Hence, we were only able to identify literature that was published and available. Nevertheless, the search was comprehensive and has considered all the options to obtain all the literature on this topic in India.

Implications

This review certainly has specific research, practice, and academic implications. There is very limited interventions research in OT in India. Researchers must conduct large RCT evaluating unaltered OT interventions following rigors standards. The review also highlights the heavy importance that OTs give to impairments as opposed to disability. OT practice must move beyond boundaries of impairments and specialized techniques and focus on disability. Academically, this review implies the need for building the capacity for scientifically rigors and well-conceptualized research in OT in India.

Conclusion

Policymakers, program planners, clinical practitioners, academicians, and researchers in occupational therapy must equip themselves with research competencies and skills. Building the capacity for rigorous and relevant scientific research in occupational therapy would enable bridging the gaps in evidence for occupational therapy in India.

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Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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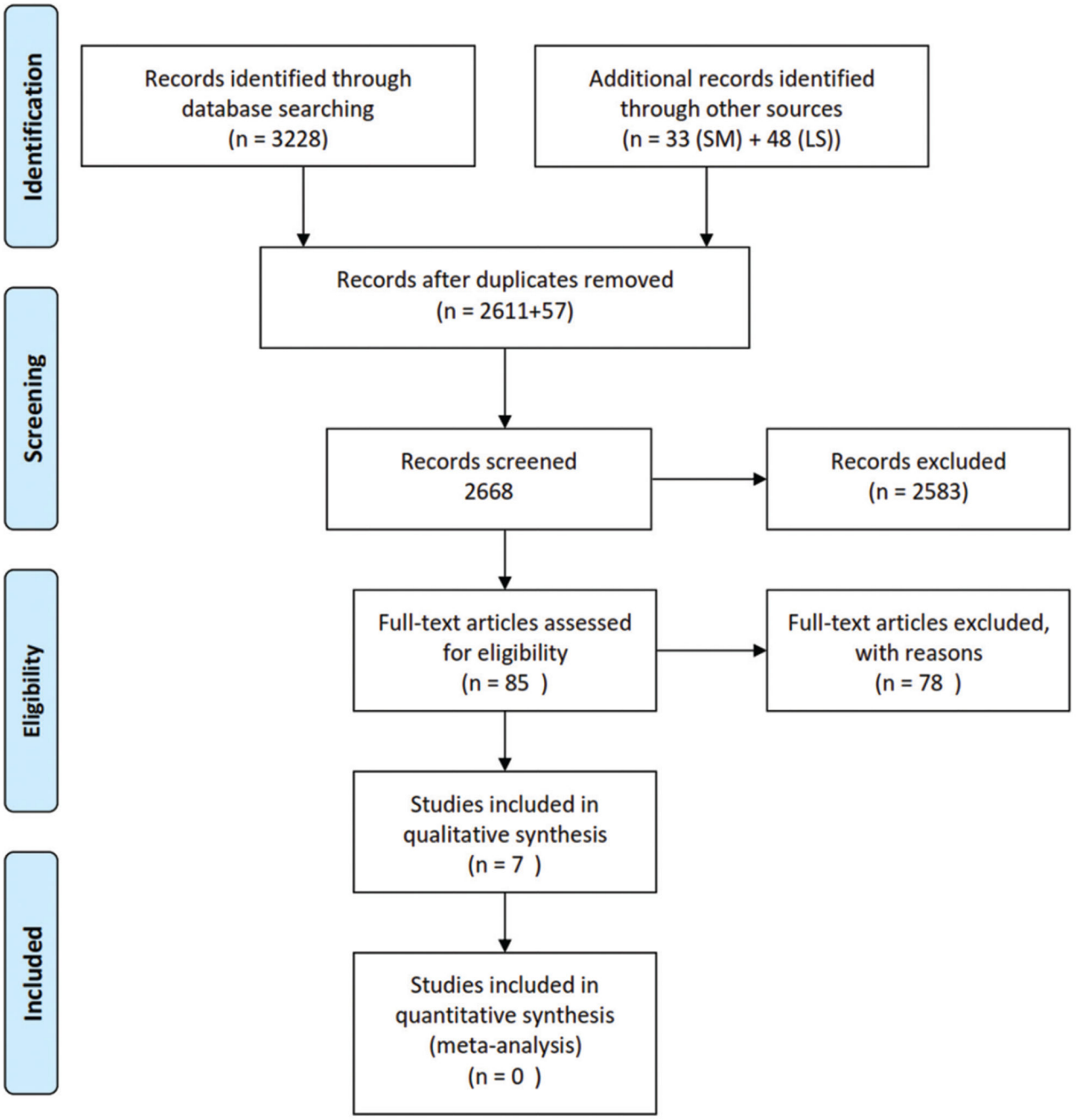

Figure 1. PRISMA Flowchart of the Search Process

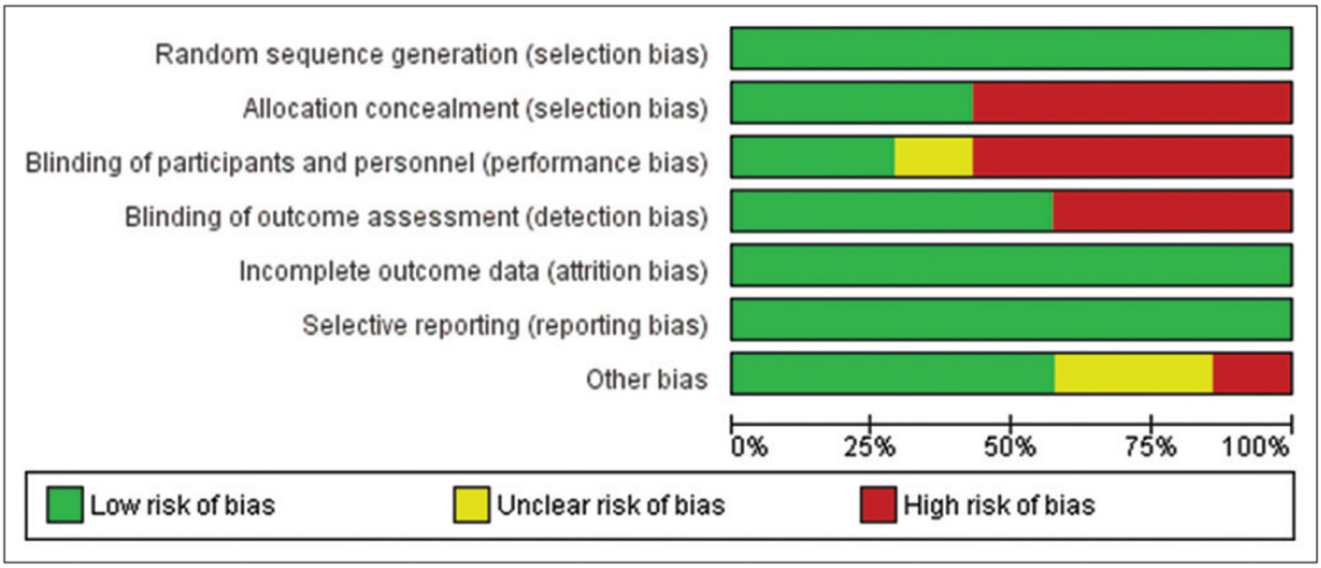

Figure 2. Risk of Bias Graph: Review Authors' Judgments about Each Risk of Bias Item Presented as Percentages across All Included Studies

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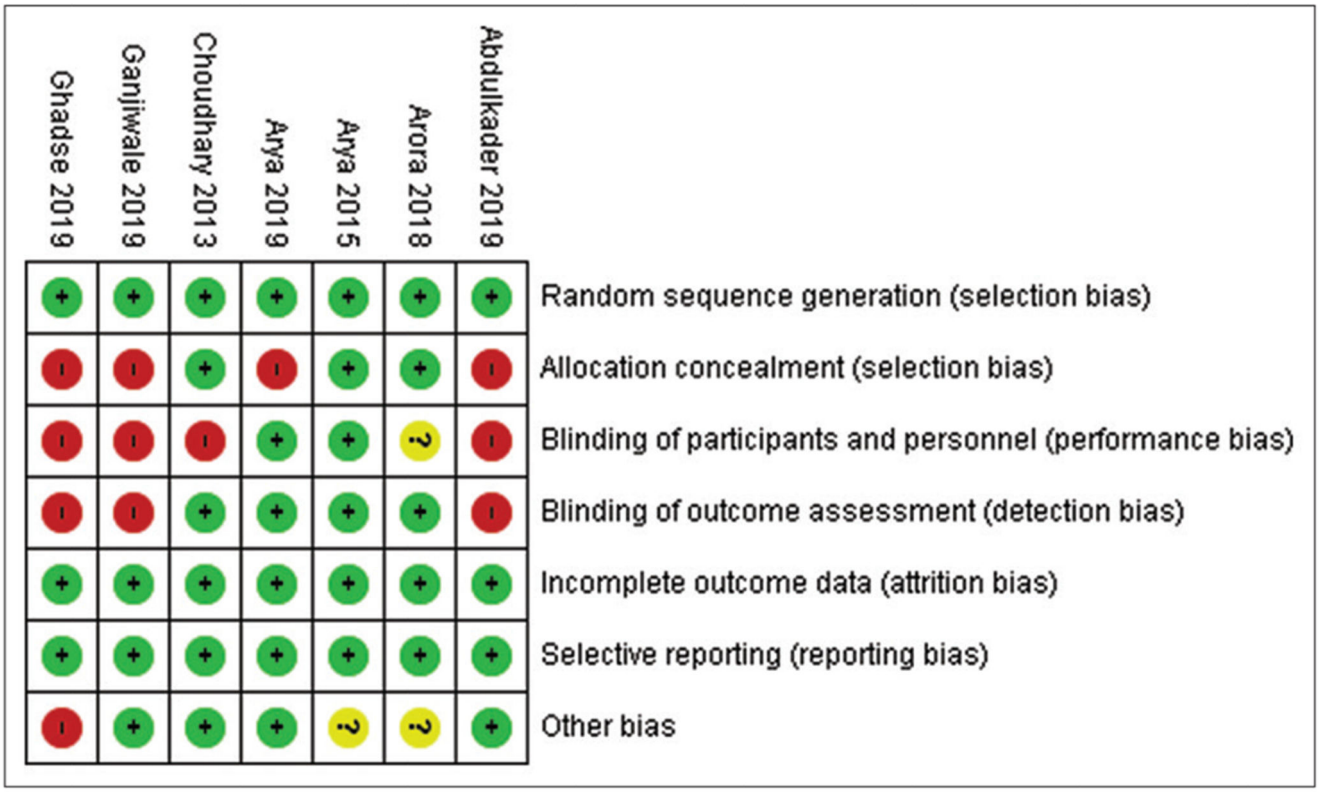

Figure 3. Risk of Bias Summary: Review Authors' Judgments about Each Risk of Bias Item

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Table 1

Characteristics of the Included Studies

Author (year)	Duration	Place of study/state	Participants diagnosis	Sample (*n*) (int/ctrl)	Age	OT intervention	Comparison	Outcomes measured
Arya (2015)	February 2013-January 2014	PDUIPH, New Delhi	Stroke with hemiparesis	33 (17/16)	<60 years	Task-based mirror therapy with conventional OT	Conventional OT	Brunnstorm recovery stage (therapist rated objective measure), Fugl-Meyer assessment (therapist rated objective measure)
Choudhary (2013)	April 2008-September 2009	Tertiary care hospital, New Delhi	Children with hemiplegic cerebral palsy	31 (16/15)	3-8 years	Modified constraint induced movement therapy	Conventional therapy	Quality of upper extremity skills test (therapist rated objective measure), nine-hole peg test (therapist rated objective measure)
Arora (2018)	March 2014-May 2014	Tertiary care hospital, Mumbai	Preterm infants	30 (16/14)	28-32 weeks	Premature infant oromotor intervention	Sham	Neonatal oromotor Assessment scale (therapist rated subjective measure), time to reach full independent wati spoon feed (therapist rated objective measure), weight gain (objective measure), number of days of hospital stay (objective measure)
Abdulkader (2019)	Not reported	Medical college hospital, Mumbai	Dequervain's tenosynovitis	36 (19/17)	20 and 40 years	Myofascial taping with conventional OT	Myofascial release with conventional OT	Visual analog scale (patient-rated subjective measure) Patient-specific functional scale (patient-rated subjective measure)
Ghadse (2019)	Not reported	Ciimhans, Chhattisgarh	Mental and behavioral disorders through drug/substance use	60 (30/30)	18-55 years	Biofeedback	Conventional therapy	Depression-anxiety-stress scale (patient-rated subjective measure)
Ganjiwale (2019)	Not reported	Gujarat	Hand injury due to fracture, crush injury, or tendon injury	65 (33/32)	18-40 years	Computer gaming with modified joystick with conventional therapy	Conventional therapy	Grip strength (therapist-rated objective measure), functional independence measure (therapist-rated objective measure)
Arya (2020)	December 2015-November 2016	Rehabilitation Institute, New Delhi	Unilateral stroke	50 (26/24)	40 and 70 years	Interlimb coupling	Conventional therapy	Fugl-Meyer assessment (therapist-rated objective measure), Rivermead visual gait assessment (therapist-rated subjective measure), functional

Author (year)	Duration	Place of study/state	Participants diagnosis	Sample (*n*) (int/ ctrl)	Age	OT intervention	Comparison	Outcomes measured
								ambulation category (therapist-rated objective measure), modified ranking scale (therapist-rated objective measure)

Int: Intervention, Ctrl: Control, OT: Occupational therapy

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Table 2
Details of the Intervention and Its Effects

Studies author (year)	Intervention	Duration	Session Details	Sample(*n*) (int/ ctrl)	Primary outcome	Effect size
Arya (2015)	Task-based mirror therapy with conventional OT	12 months	40 session of 1.5 h for 8 weeks	33 (17/16)	FMA and BRS	Mean scores of FMA-WH (P<0.001) and FMA-UE (P<0.001) at postassessment in comparison to the control group 12% increase in the number of subjects at BRS stage 5 (out of synergy movement) in the experimental group as compared to a 0% rise at the same stage in the control group
Choudhary (2013)	Modified constraint-induced movement therapy	6 months	10 sessions 2 h/ session for 10 days for 4 weeks	31 (16/15)	QUEST Nine-hole peg test	QUEST scores (10.7±5.2 vs. 1.4±1.7, P<0.001) Time (s) to complete nine-hole pegboard test compared with control group (60 [0-130] vs. 5 [−12-30], P<0.001)
Arora (2018)	Premature Infant oromotor intervention	3 months	7 days	30 (16/14)	NOMAS	Mean (SD), NOMAS over 7 days from baseline was significantly higher in the study group infants as compared to control group (9.25 [1.73] vs. 4.79 [1.52], P=0.001)
Abdulkader (2019)	Myofascial taping with conventional OT	Not reported	5 weeks	36 (19/17)	VAS PFMS	MFT group showed significant improvement in pain, compared to MFR group at the end of 5th week and significant improvement in PSFS score over MFR group at the end of 3rd week and 5th week
Ghadse (2019)	Biofeedback	Not reported	30 min session for 30 days	60 (30/30)	Depression Anxiety-Stress Scale	Significant difference in the stress (t=3.841, P<0.01, 95% CI: 3.06-9.73), anxiety (t=3.849, P<0.01, 95% CI: 2.06-6.53), and depression (t=2.03, P<0.05, 95% CI: 0.03-0.67) among patients of substance abuse disorders in the biofeedback group as compared to control group
Ganjiwale (2019)	Computer gaming with modified joystick with conventional therapy	Not reported	30 min 6 days a week for 2 weeks	65 (33/32)	Grip strength, FIM	Comparison between the two treatment arms revealed that there was no statistical difference between the improvements documented in the two groups and the improvements were not statistically significant (P>0.05)
Arya (2020)	Interlimb Coupling	12 months	3 h/week for 8 weeks	50 (26/24)	FMA, RVGA, functional ambulation category, mRS	Postintervention, the experimental group exhibited highly significant difference for FMA (mean difference=7.12, 95% CI=5.71-8.53, P<0.001), RVGA reduction (mean difference=-6.32, 95% CI=7.51-5.13, P<0.001), and median FAC enhancement (P<0.001) in comparison to the controls. the median mRS level of experimental group did not change significantly (P=0.056) when compared with the controls

OT: Occupational therapy, FMA: Fugl-Meyer assessment, FMA-UE: FMA-upper extremity, FMA-WH: FMA-wrist hand, BRS: Brunnstrom recovery stage, QUEST: Quality evaluation scoring tool, NOMAS: Neonatal Oromotor Assessment Scale, CI: Confidence interval, SD: Standard deviation, VAS: Visual analog scale, PFMS: Parent Fever Management Scale, MFT: Myofascial taping, MFR: Myofascial release, PSFS: Patient-specific functional scale, FIM: Functional Independence measure, FAC:Functional ambulation category, RVGA: Rivermead visual gait assessment, mRS: Modified ranking scale