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Review

A Systematic Review of Access to Rehabilitation for People with Disabilities in Low- and Middle-Income Countries

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Abstract: Rehabilitation seeks to optimize functioning of people with impairments and includes a range of specific health services—diagnosis, treatment, surgery, assistive devices, and therapy. Evidence on access to rehabilitation services for people with disabilities in low- and middle-income countries (LMICs) is limited. A systematic review was conducted to examine this in depth. In February 2017, six databases were searched for studies measuring access to rehabilitation among people with disabilities in LMICs. Eligible measures of access to rehabilitation included: use of assistive devices, use of specialist health services, and adherence to treatment. Two reviewers independently screened titles, abstracts, and full texts. Data was extracted by one reviewer and checked by a second. Of 13,048 screened studies, 77 were eligible for inclusion. These covered a broad geographic area. 17% of studies measured access to hearing-specific services; 22% vision-specific; 31% physical impairment-specific; and 44% measured access to mental impairment-specific services. A further 35% measured access to services for any disability. A diverse range of measures of disability and access were used across studies making comparability difficult. However, there was some evidence that access to rehabilitation is low among people with disabilities. No clear patterns were seen in access by equity measures such as age, locality, socioeconomic status, or country income group due to the limited number of studies measuring these indicators, and the range of measures used. Access to rehabilitation services was highly variable and poorly measured within the studies in the review, but generally shown to be low. Far better metrics are needed, including through clinical assessment, before we have a true appreciation of the population level need for and coverage of these services.

Keywords: access; health care; rehabilitation; people with disabilities; low- and middle-income country; universal health coverage

1. Introduction

The World Health Organization (WHO) estimates that over one billion people, or 15% of the global population, live with a disability, with 80% living in low- and middle-income countries (LMICs) [1]. Disability, defined by the International Classification of Functioning, Disability and Health (ICF), is an umbrella term for impairments, activity limitations, and participation restrictions [2]. People with disabilities experience an impairment (e.g., visual impairment) because of a health condition (e.g., glaucoma). Contextual factors, both at the individual (e.g., age, sex) and wider societal level (e.g., access to health services, attitudes towards disability), play a crucial role an individual's experience of the impairment.

People with disabilities often experience poorer levels of health than people without disabilities for various reasons [1]. By definition, people with disabilities have an underlying health condition

which causes greater health needs. For example, people with chronic health conditions such as arthritis have regular ongoing health needs relating to the health condition and associated impairment [1]. People with disabilities may also be at risk of developing secondary health conditions such as depression [3]. Furthermore, evidence from a range of settings, both high-income countries and LMIC, suggests that people with disabilities face a multitude of barriers to accessing healthcare services. Poverty and disability are linked in a cycle, whereby poverty can lead to disability, and disability to poverty [4]; poverty and poor health are known to be linked through various mechanisms including through poorer living conditions, lifestyle factors (e.g., diet, smoking), and access to health services.

People with disabilities have a need to access the same general health care services as people without disabilities such as care-seeking when ill, vaccinations, and HIV treatment. In addition to general health services, people with disabilities also may require specific health care services related to their impairment, which includes rehabilitation. Rehabilitation is a broad term that encompasses a set of interventions to address impairments—activity limitations, and participation restrictions, as well as personal and environmental factors that have an impact on functioning [1]. Rehabilitation seeks to optimize functioning of people experiencing disabilities. Therefore, it includes the range of specific health services people with disabilities may require, from diagnosis, treatment, surgery, assistive devices, and therapy.

Evidence on access to rehabilitation services is sparse; however, there is expected to be very limited capacity to meet demand for these services in LMIC. The WHO estimates that there are less than ten skilled rehabilitation practitioners per 1 million population in LMIC [5]. Furthermore, the WHO estimates that between 5 and 15% of people in need for assistive devices in LMIC have received them [6]. Even fewer are expected to have hearing aids, with less than 3% of hearing aid need being met [7]. However, as is recognized in the WHO's World Report on Disability, global data on unmet need for rehabilitation services is extremely sparse [1]. Unmet need for rehabilitation has a substantial impact on activity limitations, participation restrictions, and can result in poorer health and quality of life [1].

Rehabilitation has previously received little attention from governments, which has contributed to poor service availability and lack of co-ordination between services. Affordable and high-quality services should be available to all those in need. This is the main premise behind Universal Health Coverage (UHC), which is defined as, "ensuring all people have access to needed promotive, preventive, curative, rehabilitative, and palliative services they need, of sufficient quality to be effective, while ensuring that the use of these services does not expose the user to financial hardship" [8]. UHC is recognized as a key target in Goal 3 of the Sustainable Development Goals (SDGs) (Ensure healthy lives and promote well-being for all at all ages) [9], and so access to rehabilitation is essential in order to reach the SDG goals and targets. Access to rehabilitation for people with disabilities is also a human right, as stated in Article 26 of United Nations Convention for the Rights on People with Disabilities (UNCRPD) [10].

Recent global initiatives such as the Global Co-operative on Assistive Health Technology (GATE) strive for affordable and high-quality assistive technologies to be available for all those in need [11]. In February 2017, the WHO hosted a stakeholder meeting Rehabilitation 2030: A call to action, highlighting the issue of the substantial unmet need for rehabilitation around the world, and the lack of data on access to rehabilitation [5]. Considering the lack of data, we conducted a systematic review which aimed to summarize the current literature on access to rehabilitation for people with disabilities in LMIC, with a focus on health-related rehabilitation.

2. Materials and Methods

The systematic search was conducted in February 2017 for peer-reviewed articles that presented research findings on access to rehabilitation for people with disabilities in LMIC settings. The Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) statement was followed for conducting and reporting the review [1].

2.1. Eligibility Criteria

Studies were eligible if they met the following criteria: (1) quantitative research that included people with disabilities; (2) results reported access to rehabilitation for people with disabilities; and (3) research was undertaken in a LMIC as defined by the World Bank country classification 2017. No restrictions were placed on publication date, or language. Studies were excluded if the full text was not available after exhausting all possible sources. Duplicate reports from the same study were either combined if they reported different result or one was excluded if the results were the same.

2.2. Access to Rehabilitation Defined

For this review access was defined as use and coverage of services. Rehabilitation was defined in relation to the WHO definition as a “set of measures that assist individuals who experience or are likely to experience, disability to achieve and maintain optimal functioning in interaction with their environments” [1]. Using this definition, a broad range of interventions that may be required to maximize functioning were included: access to medical rehabilitation, access to therapy, coverage of assistive devices, and adherence to medication. Medical rehabilitation is defined as improving functioning through the diagnosis and treatment for health condition, reducing impairments and preventing or treating complications. Therapy is defined as restoring or compensating for loss of functioning, and preventing deterioration in functioning which may include physiotherapy, occupational therapy, and speech therapy. Assistive devices are defined as any equipment that is used to increase or maintain functional capabilities. We did not include studies measuring curative interventions, such as provision of spectacles, cataract surgery, hip replacement surgery, and similar treatments [12–14]. Whilst we recognize that rehabilitation extends beyond specialist health-related needs, this was beyond the scope of our review, which focused on health-related rehabilitation.

2.3. Types of Disability Measures

Studies defining disability using both the ICF definition (e.g., functioning, or activity limitations, and participation restrictions) and medical model definitions (i.e., specific impairments or disorders) were included.

2.4. Information Sources

Six databases (EMBASE, Global Health, CINAHL, Web of Science, MEDLINE, and PSYCINFO) were searched. The search strategy used key words for the following concepts: LMICs, people with disabilities, and access to health services. Terms were developed using MeSH or equivalent as well as from other reviews on similar topics. Boolean, truncation, and proximity operators were used to construct and combine searches for the key concepts as required for individual databases. An example of the search strategy is provided as Table S1. Systematic reviews identified through the search were reviewed for relevant included studies. If study protocols were identified, a search was made to determine whether the results of the study had been published. Furthermore, studies known to authors were included. No restrictions were made on language or time of publication.

2.5. Study Selection

All studies identified through the search process were exported to an EndNote database (version X7, Clarivate Analytics, Philadelphia, PA, USA) for removal of duplications and screening. Two reviewers (Tess Bright and Hannah Kuper) independently examined the titles, abstracts, and keywords of electronic records according to the eligibility criteria. Results were compared. The full texts were double screened (Tess Bright and Hannah Kuper) according to the eligibility criteria for final inclusion in the systematic review. Any disagreements in the selection of the full text for inclusion were resolved through discussion.

2.6. Data Collection Process

Data were extracted into a Microsoft Excel database developed for the purposes of this review. The first author (Tess Bright) extracted all data and this was independently examined by a second reviewer to ensure accuracy (Sarah Wallace). Data were extracted on the following study components:

- General study information, including author, year of publication
- Study design, sampling, and recruitment methods
- Study setting, and dates conducted
- Population characteristics including age, sex, and sample size
- Disability type/domain being studied, and means of assessing disability
- Results: main findings related to access to rehabilitation and any disaggregation by age, sex, urban-rural status, or other variables. We extracted data on the proportion covered by rehabilitation services in the population. Where unmet need was presented, we calculated the met need as one minus the unmet need.

We conducted a narrative synthesis due to the variation in included study designs, measurement of disability and outcomes which made meta-analysis impossible.

2.7. Risk of Bias in Individual Studies

Quality assessments of all eligible studies were carried out independently by two reviewers (Tess Bright and Sarah Wallace). We evaluated studies based on a set of criteria according to the SIGN50 guidelines [15]. Table 1 outlines the criteria used to evaluate studies.

Table 1. Quality assessment criteria and ratings.

| Assessment Criteria | |
|----------------------------|--|
| | <ul style="list-style-type: none"> • Study design, sampling method is appropriate to the study question • Adequate sample size (>100 participants), or sample size calculations undertaken • Response rate reported and acceptable (>70%) • Disability/impairment measure is clearly defined and reliable • Measure of access clearly defined and reliable • Potential confounders taken into account in analysis (if necessary) • Confidence intervals are presented |
| Overall Ratings | |
| ++ | Low risk of bias: All or almost of the above criteria were fulfilled, and those that were not fulfilled were thought unlikely to alter the conclusions of the study |
| + | Medium risk of bias: Some of the above criteria were fulfilled, and those not fulfilled were thought unlikely to alter the conclusions of the study |
| -- | High risk of bias: Few or no criteria were fulfilled, and the conclusions of the study were thought likely or very likely to alter with their inclusion |

3. Results

3.1. Study Selection

8886 unique records were identified through electronic searches. 8609 studies were excluded during title and abstract screen, resulting in 278 for the full text screen. Following full text review, 201 studies were excluded, and the full text could not be identified for 14 articles (Figure 1). Consequently, 77 studies were selected for inclusion and provided data for 106,462 people with disabilities across 64 countries.

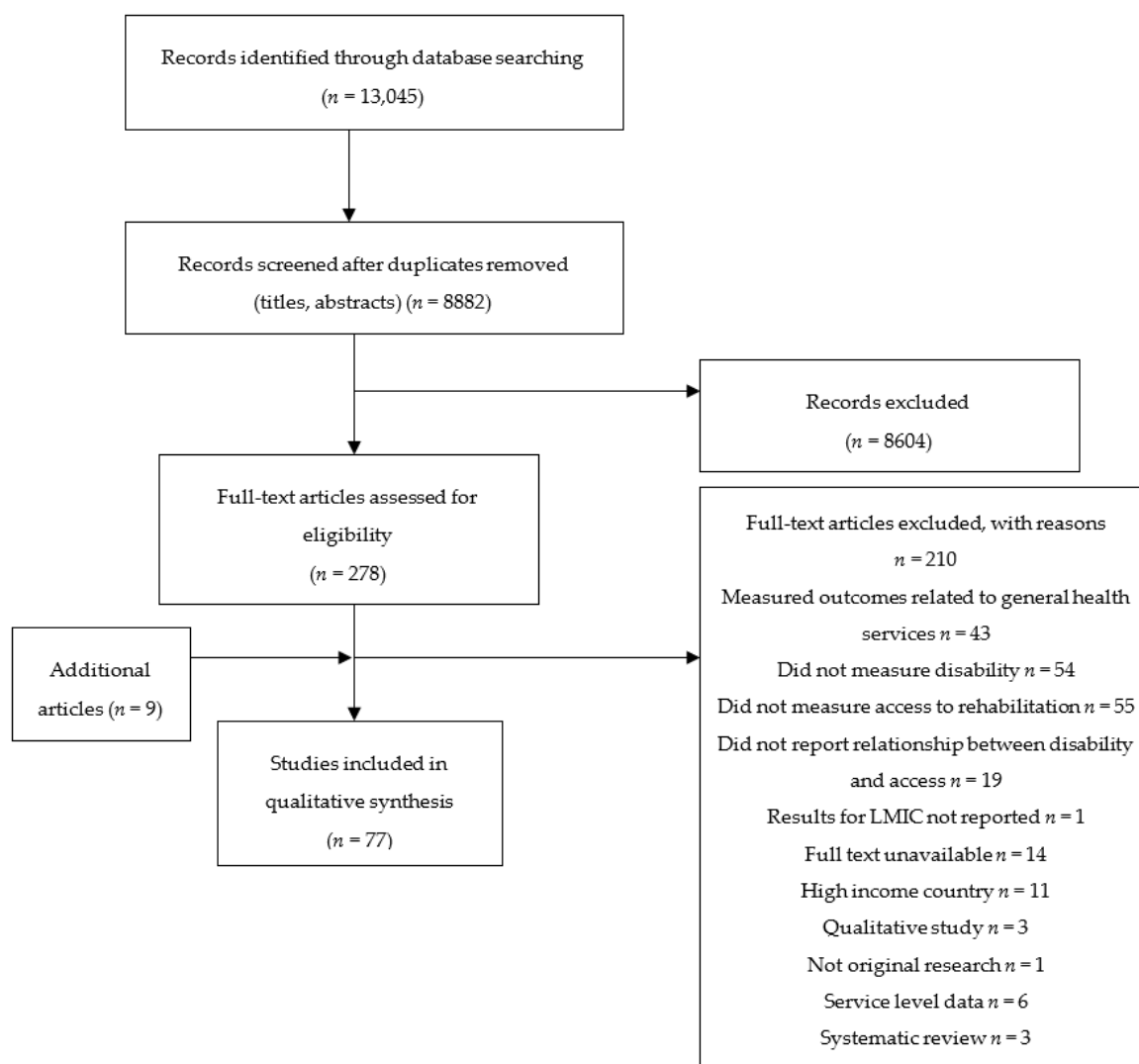


Figure 1. Flow chart of search results. (LMIC: Low- and Middle-Income Countries).

3.2. Study Characteristics

Table 2 summarizes the characteristics of the studies eligible for inclusion. By region, most studies were conducted in sub-Saharan Africa (31%), followed by South Asia (18%), Latin America (16%), East Asia (16%), Middle East (9%), and Europe (3%). A further 8% were conducted in multiple countries. In terms of location, 49% were conducted in both urban and rural areas, with 18% in urban only and 13% in rural only (location unclear for 19% of studies). Most studies (73%) were conducted at subnational (e.g., district(s), or provincial level), with the remaining 27% carrying out national surveys. Over half of studies were conducted in 2010 or later (53%). The vast majority of studies were cross-sectional surveys (82%) with the remaining studies using cohort (5%), case control (10%) or retrospective longitudinal (3%) study designs. In terms of country income group, 33% of studies were conducted in low income, 28% in low-middle income, 29% in upper-middle income and 8% in countries of varying income levels.

Table 2. Characteristics of included studies.

| Variable | Number | % |
|----------------------------------|--------|-----|
| Region | | |
| Latin America/Caribbean | 12 | 16% |
| East Asia/Pacific | 12 | 16% |
| Sub-Saharan Africa | 24 | 31% |
| Middle east | 7 | 9% |
| South Asia | 14 | 18% |
| Europe/Central Asia | 2 | 3% |
| Various | 6 | 8% |
| Country income group | | |
| Low | 26 | 33% |
| Low-middle | 22 | 28% |
| Upper-middle | 23 | 29% |
| Various | 6 | 8% |
| Location | | |
| Urban | 14 | 18% |
| Rural | 10 | 13% |
| Both | 38 | 49% |
| Unclear | 15 | 19% |
| Decade of publication | | |
| 1990–1999 | 11 | 14% |
| 2000–2009 | 25 | 32% |
| 2010–current | 41 | 53% |
| Age of participants | | |
| All ages | 29 | 38% |
| Adults only | 25 | 32% |
| Older adults | 7 | 9% |
| Children only | 11 | 14% |
| Unclear age/not presented | 5 | 6% |
| Study design | | |
| Cross-sectional | 63 | 82% |
| Retrospective longitudinal study | 2 | 3% |
| Case control study | 8 | 10% |
| Cohort | 4 | 5% |
| Disability domain | | |
| Hearing | 13 | 17% |
| Vision | 17 | 22% |
| Physical | 24 | 31% |
| Mental | 34 | 44% |
| Any disability | 27 | 35% |
| Multiple domains | 29 | 38% |

3.3. Participants

Most studies included people of all ages (38%). 32% included adults only, 9% included older adults (>40 years), and 14% included children only (<18 years). In 6% of studies the age group was unclear. Considering disability domain, a large proportion of studies measured access outcomes related to mental impairment (44%), which we defined according to the International Classification of Diseases 10 (ICD10) “mental and behavioral disorders” included mental illnesses, intellectual impairment, and developmental delay. Epilepsy, although a neurological condition according to ICD10 was also grouped under mental impairment for simplicity. The remainder considered services related

to hearing impairment (17%) visual impairment (22%), physical impairment (31%) or disability in general, across multiple domains (31%). The method of assessment of disability varied across studies, with 33 using self-reported measures (11 used the Washington Group short or extended set), 31 studies used clinical examination, four used a combination of reported and clinical measures, two used registry data, in two studies assessment methods were unclear, and the remaining three studies used alternative methods (e.g., community health worker report).

3.4. Outcome Types

Types of rehabilitation outcomes included:

- Medical rehabilitation: including received treatment/surgery, received diagnosis, access to, or ever received rehabilitation (any type), received therapy (physical, occupational, speech and language) (48 studies, 62%)
- Assistive devices: including hearing aids, mobility aids, low vision devices, or any assistive device (25 studies, 32%)
- Adherence: including adherence to treatment, treatment completion rate, and uptake of referral (25 studies, 32%)

In addition, data on barriers to accessing rehabilitation for people with disabilities were extracted as secondary outcomes in 23 studies (30%).

3.5. Description of Studies

Results of the 77 included studies are presented below by access to services specific to the following disability domains: hearing, mental health, physical, and visual. Where multiple domains were measured, and access outcomes were not disaggregated by domain, the results are presented in a separate section on rehabilitation for any disability.

3.5.1. Access to Rehabilitation for Hearing Impairment

In total, 13 studies measured access to hearing specific services in 12 LMIC countries, and four World Bank regions. The study populations used to assess access varied across studies, with the majority using population-based data; however, one sampled children from deaf schools, two from registries and one from a clinic. Most studies in this group (seven studies) were conducted among people of all ages. Five studies were conducted in children, and two among older adults. The method of assessment varied, with five using the Washington Group short or extended set, one using the WHO 'Ten Questions', three using a bespoke self-reported tool, two conducting clinical assessments, and the remaining two using other methods (registry, community health worker identification). The access results are thus not directly comparable. Results are outlined in Table 3. Overall, nine studies measured coverage of assistive devices, seven studies measured access to medical rehabilitation, and one measured adherence. Coverage of assistive devices ranged from 0–66% across studies. General rehabilitation coverage (i.e., access to hearing services) was between 3–62%. Finally, one study measured adherence/compliance with referral and estimated this to be 34%.

Across studies, no clear patterns of access were seen by country group, locality, or by age. Coverage of assistive devices tended to increase with country income group but was typically quite low. One national study by Malta et al. (2016) in Brazil measured association between locality (urban or rural) and access and found a higher proportion had assistive devices in urban areas compared to rural areas. In terms of the quality of the evidence across studies, most studies were judged to have low risk of bias (eight studies). Six studies were judged to have high or medium risk of bias due to small sample size (three studies), means of assessing disability unreliable (three studies), or poor response rate (two studies).

Table 3. Access to hearing impairment specific services (D = disability).

| Study Author, Year | Country (Study Location) | World Bank Region | Country Income Group | Locality (Urban or Rural) | Study Type | Participant Source | N (%D) | Age | Means of Assessing Disability | Outcome | Proportion Covered by Type of Rehabilitation (%) | | | Risk of Bias |
|----------------------------------|------------------------------------|-------------------|----------------------|---------------------------|-----------------------|--------------------|--|--------------|--|--|--|-------------------|------------------------|---|
| | | | | | | | | | | | Medical Rehabilitation | Assistive Devices | Adherence to Treatment | |
| Allain et al. (1997) [16] | Zimbabwe (Bindura, Marondera) | SSA | Low income | Both | Cross-sectional study | Population | 278 (NS); 55 (20%) with hearing impairment | Older adults | Self-report (bespoke tool, but unclear method) and observation by nurses | Wearing hearing aids when needed | - | 0 | - | Medium: adequate sample size, but small number with hearing loss, and unclear how hearing loss assessed |
| Bernabe-Ortiz et al. (2016) [17] | Peru (Morropon) | SSA | Upper-middle income | Semi-urban | Case control study | Population | 322 (50%) | All ages | Washington Group short set | Coverage of hearing aids (proportion of those who use hearing aids among those reported in need) | - | 9 | - | Medium: low response rate |
| Danquah et al. (2015) [18] | Haiti (Port-au-Prince) | LA | Low income | Urban | Case control study | Population | 356 (50%) | All ages | Washington Group short set | Met need for medical rehabilitation | 3 | 3 | - | Low |
| Devendra et al. (2013) [19] | Malawi (Lilongwe) | SSA | Low income | Unclear | Case control study | Clinic | 592 (50%) | Children | WHO ten questions | Proportion of children who attended ear clinic of those in need | 14 | - | - | Low |
| Kuper et al. (2016) [20] | Tanzania (Mbeya, Tanga, Lindi) | SSA | Low income | Both | Case control study | Population | 807 (39%) | All ages | Washington Group short set | Coverage of hearing aids (proportion of those who use hearing aids among those reported in need) | - | 0 | - | Low |
| Maart et al. (2013) [21] | South Africa (Cape Town) | SSA | Upper-middle income | Urban | Cross-sectional study | Population | 151 (100%) | All ages | Washington Group short set | % needing hearing therapy that received | 42 | - | - | Low |
| Mactaggart et al. (2015) [22] | Cameroon (Fundong Health District) | SSA | Low-middle income | Unclear | Case control study | Population | 845 (60%) | All ages | Washington Group extended set and clinical assessment | Coverage of hearing aids | - | 24 | - | Low |
| | India (Mahabunagar) | SA | Low-middle income | 703 (61%) | | | - | | | | 6 | - | | |
| Malta et al. (2016) [23] | Brazil (National) | LA | Upper-middle income | Both | Cross-sectional study | Population | 204,000 (NS) | All ages | Self-report (bespoke tool) | Attendance at rehabilitation services for those in need | 8 (9 urban, 4 rural) | - | - | Low |

Table 3. Cont.

| | | | | | | | | | | | | | | |
|-------------------------------|--------------------------------|-----|---------------------|---------|--------------------------|--------------|-------------|--------------|--|--|----|----|----|--|
| Nesbitt et al. (2012) [24] | Bangladesh (Natore, Sirajgani) | SA | Low income | Both | Prospective cohort study | Population | 1308 (100%) | Children | Clinical assessment | Uptake/compliance with referral for assistive device, therapy, further investigation, medicine, or surgery | - | - | 34 | Low |
| Omondi et al. (2007) [25] | Kenya (Kisumu) | SSA | Low income | Both | Cross-sectional study | Deaf schools | 33 (100%) | Children | Clinical assessment | Visit for hearing assessment (diagnosis); hearing aid use (assistive device) | 27 | 0 | - | High: small sample size |
| Padmamohan et al. (2009) [26] | India (Kerala) | SA | Low-middle income | Rural | Cross-sectional study | Population | 98 (100%) | Children | Households of children with disabilities were identified with community health workers | Use of rehabilitation treatment | 16 | - | - | Medium: small sample size; unclear measure of disability |
| Ribas et al. (2015) [27] | Brazil (Curitiba) | LA | Upper-middle income | Rural | Cross-sectional study | Clinic | 578 (32%) | Older adults | Self-report (bespoke tool) | Had hearing test (diagnosis); wore hearing aids (assistive device) | 28 | 16 | - | Low: unreliable measure of disability |
| Tan et al. (2015) [28] | Malaysia (Penang) | EAP | Upper-middle income | Unclear | Cross-sectional study | Registry | 305 (100%) | Children | Registry | Coverage of hearing aids (assistive devices); proportion accessing hearing services) | 62 | 66 | - | High: poor response rate, and unreliable measure of disability |

SSA: sub-Saharan Africa, LA: Latin America, SA: South Asia, EAP: East Asia & Pacific.

3.5.2. Access to Rehabilitation for Mental Impairment

In total, 34 studies measured access to specialist health services for people with mental impairments in 17 countries across six World Bank regions. Three studies were multi-country studies, for which it was possible to disaggregate results by country. For several countries, multiple studies were identified—three in China, three in Lebanon, four in Mexico, five in India, four in South Africa and four in Brazil. Considering age, the majority were conducted among adults (19 studies), among people of all ages, four among children, and one among older adults. Most studies sampled participants from the population (28 studies); the remaining sampled from schools (one study), clinic (three studies), or a variety of sources (two studies).

This category encompasses a broad range of conditions, from depression to intellectual impairment. Our search identified nine studies focusing on depression (or major depressive disorder), four studies on schizophrenia, three on epilepsy, five studies on psychiatric disorders, 14 measured general mental disorders with quite varied measures of assessment, two studies measured unspecified mental health conditions and the remaining two studies focused on intellectual impairment. In terms of method of assessment, a wide range of tools were used: five used a clinical diagnosis/examination, eight used the WHO composite international diagnostic interview, five used other validated questionnaires or tools (e.g., DSM-IV), two used the Washington Group short set, two used other validated self-reported tools, eight used bespoke self-reported tools (three of these combining with a clinical screen), one used household report, and one used global burden of disease data (see Table 4 for details).

In terms of outcomes, 28 measured access to medical rehabilitation, and five measured adherence to treatment. Access to medical rehabilitation for depression, which included treatment coverage and use of mental health services, most ranged from 0% for males in Mexico (subnational) to 54% in Brazil (national). El Sayed et al. (2015) found 65% of people with depression were in treatment across various LMIC using nationally representative data from the World Health Surveys. For schizophrenia, treatment coverage ranged from 50–71% in India (both subnational studies). Two multi-country studies were conducted, the first by Lora et al. (2012) found coverage of 11% (low income countries) to 31% (low-middle income countries) using the WHO Assessment Instrument for Mental Health Systems and the second by El Sayed et al. (2015) found coverage of 67% World Health Survey data. Coverage of epilepsy treatments ranged from 0% for older adults in Zimbabwe (subnational), to 52% among people of all ages in The Gambia (subnational). For children with intellectual disabilities coverage was higher: 73% in Ethiopia (subnational) and 87% in India (subnational) (two studies only). For other less specific conditions, coverage of medical rehabilitation ranged from 1% in China (national) (use of services, all ages) to 68% for adults in South Africa (subnational) (percent needing rehabilitation who received, all ages).

The broad range of conditions, source of participants, outcomes, and age groups mean that estimates within this group cannot be directly compared. However, it was clear that access for all outcomes was quite low across studies, except for children with intellectual impairments. There was considerable variation, even within studies conducted in the same country.

Across studies, no clear pattern was seen by country income level, locality or by age. One study by Lora et al. (2012) found lower treatment coverage in low income countries (11%) compared to low-middle income countries (31%). Considering other equity indicators, Li et al. (2013) and El Sayed et al. (2015) found higher coverage for insured people. Hailemariam et al. (2012) Andersson et al. (2013), Chikovani et al. (2015), Andrade et al. (2002) found no significant difference in access by employment, or income, while Ma et al. (2012) and Raban et al. (2010) found that poorer people were less likely to continue treatment. Demyttenaere et al. (2004) found an increase in coverage with severity of impairment in Colombia, Iraq, Lebanon, Mexico, Nigeria, and Ukraine, but not in other countries.

In terms of the quality of the evidence, the vast majority of studies included in this group were judged to have low risk of bias (30 studies). Three studies had high or medium risk of bias due to small sample size (three studies), unclear or low response rate (four studies), or unreliable means of assessing disability (five studies).

Table 4. Results for studies measuring mental impairments (D = disability).

| Study Author, Year | Country (Study Location) | World Bank Region | Country Income | Locality (Urban/Rural) | Study Type | Participant Source | N (%D) | Age Group | Specific Condition | Method of Assessment | Outcome | Proportion Covered by Rehabilitation Type % | | Risk of Bias |
|---|---|-------------------|----------------|------------------------|--|---|--------------|-----------|------------------------------|--|--|---|------------------------|---------------------------------------|
| | | | | | | | | | | | | Medical Rehabilitation | Adherence to Treatment | |
| Studies measuring mental health and psychiatric disorders | | | | | | | | | | | | | | |
| Abas et al. (1997) [29] | Zimbabwe (Harare) | SSA | Low income | Urban | Cross-sectional study | Population | 51 (100%) | Adults | Depression and anxiety | Screening questionnaire and clinical examination | Receipt of antidepressant or anxiolytic | 0 (antidepressant) 10 (anxiolytic) | - | Medium: small sample size |
| Alekhya et al. (2015) [30] | India (Andhra Pradesh) | SA | Low-middle | Both | Cross-sectional study | Clinic | 103 (100%) | Adults | Depression | Clinical diagnosis | Proportion with good adherence | - | 30 | Medium: unclear measure of disability |
| Andersson et al. (2013) [31] | South Africa (Eastern Cape) | SSA | Upper-middle | Both | Cross-sectional study | Population | 977 (31%) | Adults | Depression | DSM-IV schedule (mini international neuropsychiatric review) | Proportion of those emotionally troubled who sought care | 43 | - | Low |
| Hailemariam et al. (2012) [32] | Ethiopia (9 regions) | SSA | Low income | Both | Cross-sectional survey | Population | 449 (100%) | Adults | Depression | World Mental Health Survey version of the Composite International Diagnostic Interview | Visiting health facilities for depressive episodes | 23 | - | Low |
| Snyder et al. (1999) [33] | Mexico (Jalisco) | LA | Upper-middle | Rural | Cross-sectional study | Population | 945 (6.2%) | Adults | Depression | WHO World Mental Health Composite International Diagnostic Interview | Treatment received | Male 0; Female 13.0 | - | Low |
| Karam et al. (1994) [34] | Lebanon (Bejjeh, Kornet Shehwan, Ashrafieh, Ain Remmaneh) | ME | Upper-middle | Unclear | Cross-sectional study | Population | 213 (100%) | Adults | Major depressive disorder | Diagnostic Interview Schedule (DIS) by psychologists | Consulted doctor; consulted other professional; treatment received | 23; 6; 30 | - | Medium: risk of recall bias |
| Fujii et al. (2012) [35] | Brazil (National) | LA | Upper-middle | Both | Cross-sectional, web-based survey | Population (identified through the web) | 9789 (10%) | Adults | Major depressive disorder | Self-report (bespoke tool) followed by validated questionnaire | Currently taking prescription medication | 54 | - | High: risk of selection bias |
| El Sayed et al. (2015) [36] | 48 LMICs (various National level surveys) | Various | Various | Both | Cross-sectional study (World Health Surveys) | Population | 197,914 (NS) | Adults | Depression and schizophrenia | Self-report (bespoke tool) | Proportion in treatment: depression, schizophrenia | 65; 67 | - | Low |

Table 4. Cont.

| | | | | | | | | | | | | | | |
|---------------------------------|--|---------|--------------|---------|------------------------|------------|-------------|----------|------------------------------|---|---|--|---|--|
| Raban et al. (2010) [37] | India (Assam, Karnataka, Maharashtra, Rajasthan, Uttar Pradesh, West Bengal) | SA | Low-middle | Both | Cross-sectional study | Population | 9994 (NS) | Adults | Depression and schizophrenia | Self-report (validated tool) | Treatment coverage: depression; schizophrenia | 12; 50 | - | Medium: means of assessing disability not reliable |
| Padmavathi et al. (1998) [38] | India (Madras) | SA | Low income | Urban | Cross-sectional study | Population | 261 (100%) | All ages | Schizophrenia | Family report using screening tool, and detailed examination by a psychiatrist | Ever received treatment | 71 | - | Low |
| Lora et al. (2012) [39] | 50 LMICs (National) | Various | Various | Unclear | Cross-sectional survey | Various | Unclear | Adults | Schizophrenia | Global burden of disease data for prevalence of schizophrenia, and number of people who received care (facility level data) | Treatment coverage (psychiatrist, mental health professionals) | 11 (Low income); 31 (Low-middle income) | - | Low |
| Demyttenaere et al. (2004) [40] | China (National) | EAP | Low-middle | Urban | Cross-sectional study | Population | 1628 (21%) | Adults | Mental disorders | WHO composite international diagnostic interview (WMH, CIDI) | Sought treatment for condition in the past 12 months: mild; moderate; serious | Beijing: mild 2; serious: 12 Shanghai: serious: 0.5 | - | Low |
| | Nigeria (National) | SSA | Low income | Urban | | | 1682 (14%) | | | | | 10 | - | Low |
| | Ukraine (National) | EU | Low-middle | Both | | | 1720 (56%) | | | | | Mild 7 Moderate 17 Serious 19 | - | Low |
| | Lebanon (National) | ME | Upper-middle | Both | | | 1029 (47%) | | | | | Mild 4.5 Moderate 10 Serious 15 | - | Low |
| | Colombia (National) | LA | Low-middle | Urban | | | 2442 (33%) | | | | | Mild 8 Moderate 12 Serious 24 | - | Low |
| | Mexico (National) | LA | Upper-middle | Urban | | | 2362 (30%) | | | | | Mild 10 Moderate 19 Serious 20 | - | Low |
| Andrade et al. (2002) [41] | Brazil (Sao Paulo) | LA | Upper-middle | Urban | Case control study | Population | 1464 (27%) | Adults | Mental disorders | WHO World Mental Health Composite International Diagnostic Interview | Received specialty medical care: any disorder; mood; anxiety; substance use | 13; 23; 20; 10 | - | Low |
| Caraveo et al. (1999) [42] | Mexico (Mexico City) | LA | Upper-middle | Urban | Cross-sectional study | Population | 1937 (8.3%) | Adults | Mental health condition | WHO World Mental Health Composite International Diagnostic Interview | Care seeking for mental health condition | Total proportion seeking help < 50% | - | Medium: response rate lower than 70% |

Table 4. Cont.

| | | | | | | | | | | | | | | |
|------------------------------|---|---------|--------------|---------|-----------------------|--------------------------------------|--------------------|----------|---|--|--|----------|----|---|
| Loeb et al. (2004) [43] | Malawi (National) | SSA | Low income | Both | Cross-sectional study | Population | 1574 (100%) | All ages | Mental/emotional difficulties | Self-report (bespoke tool) | Ever received rehabilitation (medical) | 22 | - | Low |
| Eide et al. (2006) [44] | Zambia (National) | SSA | Low income | Both | Cross-sectional study | Population | 2865 (100%) | All ages | Difficulties remembering, concentrating | Washington Group short set | Ever received rehabilitation (medical) | 30 | - | Low |
| Alhasnawi et al. (2009) [45] | Iraq (National) | ME | Low-middle | Both | Cross-sectional study | Population | 4332 (14.5%) | Adults | Mental disorders | Questionnaire based on ICD10 and DSM-IV | Any health care treatment (mild; moderate; serious) | 3; 4; 17 | - | Low |
| Li et al. (2013) [46] | China (National) | EAP | Upper-middle | Both | Cross-sectional study | Population | 2.6 million (0.6%) | All ages | Mental disorders | Self-report (bespoke tool) followed by clinical examination and WHO DAS | Use of services: rehabilitation; medication | 1; 40 | - | Low |
| Maart et al. (2013) [21] | South Africa (Cape Town) | SSA | Upper-middle | Urban | Cross-sectional study | Population | 151 (100%) | All ages | Difficulties remembering | Washington Group short set | Proportion needing treatment who received | 68 | - | Low |
| Malta et al. (2016) [23] | Brazil (National) | LA | Upper-middle | Both | Cross-sectional study | Population | 20,400 (6%) | All ages | Mental impairment (unspecified) | Self-report (bespoke tool) | Attendance at rehabilitation services | 30 | - | Low |
| Chikovani et al. (2015) [47] | Georgia (conflict affected areas) | EU | Upper-middle | Unclear | Cross-sectional study | Population (conflict affected areas) | 3600 (30%) | Adults | Mental impairment | Self-report (bespoke) and validated clinical tools | Self-reported problem and sought care | 39 | - | Low |
| Trump et al. (2006) [48] | South Africa (National) | SSA | Upper-middle | Both | Cross-sectional study | Support group members, leaders | 331 (100%) | All ages | Mental disorders | Self-report (bespoke tool) | Compliance (self-report) | - | 32 | High: low response rate, means of assessing disability unreliable |
| Ormel et al. (2008) [49] | 6 LMICs (regional: Colombia, Mexico, China; national: Lebanon, South Africa, Ukraine) | Various | Various | Both | Cross-sectional study | Population | 73,441 (NS) | Adults | Mental disorders | Self-report (Chronic disorders checklist) | Treatment prevalence by type of impairment: mental disorders (visiting a professional) | 8 | - | Low |
| Seedat et al. (2009) [50] | South Africa (National) | SSA | Low-middle | Both | Cross-sectional study | Population | 4317 (NS) | Adults | Mental disorders | World Health Organization (WHO) Composite International Diagnostic Interview | Sought treatment for condition in the past 12 months | 25 | - | Low |

Table 4. Cont.

| | | | | | | | | | | | | | | |
|--|---|-----|--------------|-----------|-----------------------|-----------------------|--------------|----------|---|---|---|----------------------|----|--|
| Ma et al. (2012) [51] | China (Guangdong) | EAP | Upper-middle | Urban | Cohort study | Population, hospitals | 1386 (100%) | Adults | Psychiatric disorders | Clinical diagnosis | Adherence to medication | - | 95 | Low |
| Caraveo et al. (1997) [52] | Mexico (Mexico City) | LA | Upper-middle | Urban | Cross-sectional study | Population | 2857 (28.7%) | All ages | Psychiatric disorders | WHO World Mental Health Composite International Diagnostic Interview | Care seeking for mental health condition | 14 | - | Medium: response rate lower than 70% |
| Paula et al. (2014) [53] | Brazil (North, Northeast, Central, Southeast) | LA | Upper-middle | Both | Cross-sectional study | Schools | 1721 (12%) | Children | Psychiatric disorders | Validated tool (KSADS-PL) based on caregiver report | Mental health service use in past 12 months: affective; anxiety; disruptive; eating; psychotic disorder; co-morbidity | 20; 17; 20; 9; 0; 30 | - | Low |
| Chadda et al. (2000) [54] | India (Delhi) | SA | Low income | Not clear | Retrospective study | Clinic | 80 (100%) | All ages | Psychiatric morbidity (schizophrenia, bipolar, unspecified psychosis) | Clinical diagnosis | Compliance with treatment regimen | - | 97 | High: small sample size |
| Llosa et al. (2014) [55] | Lebanon (Burj el-Barajneh refugee camp) | ME | Upper-middle | Urban | Cross-sectional study | Population | 194 (45%) | Adults | Psychiatric disorders | WHO UNHCR Assessment Schedule of Serious Symptoms in Humanitarian Settings (WASSS), followed by clinical exam | Treatment coverage (received psychological or psychiatric care) | 6 | - | Medium: Low response rate |
| Results of studies measuring intellectual impairment | | | | | | | | | | | | | | |
| Padmamohan et al. (2009) [26] | India (Kerala) | SA | Low-middle | Rural | Cross-sectional study | Population | 98 (100%) | Children | Intellectual impairment | Households of children with disabilities were identified by community health workers | Treatment received | 87 | - | Medium: small sample size; unclear measure of disability |
| Dejene et al. (2016) [56] | Ethiopia (Addis Ababa) | SSA | Low income | Urban | Cross-sectional study | Clinic | 102 (100%) | Children | Intellectual disability, autism spectrum disorder | Clinical diagnosis | Met need for treatment by health professional | 73 * | - | Low |

Table 4. *Cont.*

| Results of studies measuring epilepsy | | | | | | | | | | | | | | |
|---------------------------------------|---|-----|------------|-------|--|------------|-------------|--------------|----------|---|--|----|----|---------------------------------------|
| Allain et al. (1997) [16] | Zimbabwe (Uzumba Maramba Pfungwe, Bindura, Marondera) | SSA | Low income | Both | Cross-sectional study | Population | 278 (NS) | Older adults | Epilepsy | Self-report (bespoke tool, method unclear), nurse observation | Receipt of anti-epileptic medication | 0 | - | Medium: unclear measure of disability |
| Coleman et al. (2002) [57] | Gambia (Farafenni) | SSA | Low income | Rural | Cross-sectional study | Population | 69 (100%) | All ages | Epilepsy | Screening questionnaire followed by psychologist review | Ever sought biomedical treatment for epilepsy (medication) | 52 | - | Low |
| Nesbitt et al. (2012) [24] | Bangladesh (Natore, Sirajgani) | SA | Low income | Both | Key informant method; prospective cohort study | Population | 1308 (100%) | Children | Epilepsy | Clinical diagnosis | Took up referral | - | 34 | Low |

* Met need calculated as 100-unmet need (27.5% unmet need for treatment by health professional). SSA: sub-Saharan Africa, LA: Latin America, SA: South Asia, EAP: East Asia & Pacific, ME: Middle East; EU: Europe.

3.5.3. Access to Rehabilitation for Physical Impairment

Table 5 provides the results of 24 studies measuring access to rehabilitation for physical impairment. Studies were conducted across 17 countries and five World Bank regions. Types of physical impairments were varied, including rheumatoid or other arthritis (five studies), cerebral palsy (two studies), leprosy (two studies), difficulties walking (six studies), amputation (one study), musculoskeletal impairment (three studies), and unspecified physical impairment (eight studies). In terms of method of assessment, four used the Washington Group short or extended set questions (self-reported difficulties walking), eight used other self-reported tools, one used a chronic disorders checklist, five used a clinical diagnosis, four selected participants from a registry, one used community health worker report, and one study the method was unclear. Five studies were conducted among adults, 11 among people of all ages, six among children and in two studies the age group was not presented. Outcomes included access to physical therapy, assistive devices, medical rehabilitation, and adherence. The vast majority of studies were conducted on population-based samples; however, six sampled from clinic/hospital, and two from registries.

Access results for arthritis varied, with the highest coverage seen in Jordan (subnational) (76%) and lowest in India (subnational) (4%). Adherence to leprosy treatment was also quite high (71–75% in Nepal and Chad, both subnational studies); however, this may reflect the fact that these were both clinic-based studies. Results were more varied for less specific physical impairments such as “difficulties walking”, musculoskeletal impairment, and physical impairment—with coverage of assistive devices ranging between 5–57% in Tanzania (subnational) and 41–93% in Cameroon (subnational) (depending on the type of assistive device). Coverage of medical rehabilitation in Brazil was 18%, while in South Africa this was 66%.

Coverage did not tend to increase with country income group or show a clear pattern by age or locality across studies. El Sayed et al. (2015) found higher coverage among those covered with insurance in a multi-country study [36].

Ten studies were judged to have low risk of bias. A further 14 studies were judged to have medium (ten studies) or high risk of bias (four studies) due to unclear or unreliable measure of disability or access (eight studies) or small sample size (four studies), or low response rate (three studies).

Table 5. Results for physical impairment.

| Study Author, Year | Country (Study Location) | World Bank Region | Country Income | Locality (Urban/Rural) | Age Group | Study Type | Participant Source | N (%D) | Specific Condition | Method of Assessment | Outcome | Proportion Covered by Type of Rehabilitation % | | | Risk of Bias |
|----------------------------------|--|-------------------|-------------------|------------------------|---------------|-----------------------|------------------------------------|---------------|-----------------------------------|--|---|--|------------------|-----------|--|
| | | | | | | | | | | | | Medical Rehabilitation | Assistive Device | Adherence | |
| Bernabe-Ortiz et al. (2016) [17] | Peru (Moroppan) | LA | Upper-middle | Semi-urban | All ages | Case control study | Population | 798, 308 (5%) | Difficulties walking (WG) | Washington Group short set | Coverage: Walking stick; wheelchair, crutches, standing frame | - | 26; 33; 26; 10 | - | Medium: low response rate |
| Bigelow et al. (2004) [58] | Haiti (Port-de-Paix, Cap-Haitien, Fort Libertre, Port-au-Prince, Jacmel, Les Cayes, Jeremie) | LA | Low income | Both | All ages | Cross-sectional study | Registry, hospitals, organizations | 164 (100%) | Amputation | Registry, hospitals, word of mouth | Had a prosthetic limb in the past, or currently had | - | 25 | - | High: small sample size |
| Devendra et al. (2013) [19] | Malawi (Lilongwe) | SSA | Low income | Unclear | Children | Case control study | Clinic | 592 (50%) | Physical impairment (unspecified) | WHO ten questions | Proportion of children who attended physiotherapy | 42 | | | Low |
| Doocy et al. (2016) [59] | Jordan (National) | ME | Upper-middle | Both | Not presented | Cross-sectional study | Population | 9580 (14%) | Arthritis | Self-report (bespoke tool) | Care sought for chronic condition | 76 | - | - | Medium: unreliable measure of disability |
| El Sayed et al. (2015) [36] | 48 LMIC (National) | Various | Various | Both | Adults | Cross-sectional study | Population | 197,914 (NS) | Arthritis | Self-report (bespoke tool) | Proportion in treatment | 77 | - | - | Low |
| Eide et al. (2006) [44] | Zambia (National) | SSA | Low income | Both | All ages | Cross-sectional study | Population | 2865 (100%) | Difficulties walking (WG) | Self-report (bespoke tool) | Ever received assistive devices; Ever received rehabilitation (medical) | 25 | 50 | - | Low |
| Gadallah et al. (2015) [60] | Egypt (Cairo) | ME | Low-middle income | Urban | Adults | Cross-sectional study | Clinic | 140 (100%) | Arthritis (rheumatoid) | Patients registered with rheumatology clinic | Medication adherence test | - | - | 0 | High: unclear measure of disability; clinic-based sample; recall bias likely |
| Kumar et al. (2004) [61] | Nepal (Dhanusa) | SA | Low income | Unclear | Adults | Cross-sectional study | Clinic | 273 (42%) | Leprosy | Clinical examination (WHO guidelines) | Treatment completion | - | - | 71 | Medium: unclear how patients selected, clinic-based sample |
| Kuper et al. (2016) [20] | Tanzania (Mbeya, Tanga, Lindi) | SSA | Low income | Both | All ages | Case control study | Population | 254 (50%) | Difficulties walking (WG) | Washington Group short set + albinism | Coverage of: Wheelchair; crutches; walking stick; standing frame | - | 5; 50; 53; 57 | - | Low |

Table 5. Cont.

| | | | | | | | | | | | | | | | |
|-------------------------------|--|---------|-------------------|---------|---------------|-----------------------|------------|--------------|-----------------------------------|-------------------------------------|---|------------------------------|----------------|----|--|
| Loeb et al. (2004) [43] | Malawi (National) | SSA | Low income | Both | All ages | Cross-sectional study | Population | 1574 (100%) | Difficulties walking (WG) | Self-report (bespoke tool) | Ever received assistive devices; Ever received rehabilitation (medical) | 31 | 25 | - | Low |
| Malta et al. (2016) [23] | Brazil (National) | LA | Upper-middle | Both | All ages | Cross-sectional study | Population | 204,000 (NS) | Physical impairment (unspecified) | Self-report (bespoke tool) | Attendance at rehabilitation services | 18 | - | - | Low |
| Maart et al. (2013) [21] | South Africa (Cape Town) | SSA | Upper-middle | Urban | All ages | Cross-sectional study | Population | 151 (100%) | Difficulties walking (WG) | Washington Group short set | Medical rehabilitation coverage | 66 | - | - | Low |
| Mactaggart et al. (2015) [22] | India (Mahabnagar) | SA | Low-middle income | Unclear | All ages | Case control study | Population | 845 (60%) | Difficulties walking (WG) | Washington Group extended set | Coverage of: Wheelchair; crutches; walking stick; standing frame | - | 26; 43; 87; 58 | - | Low |
| | Cameroon (Fundong Health District) | SSA | Low-middle income | | | | | 703 (61%) | | | | | 41; 32; 93; 33 | | |
| McConachie et al. (2000) [62] | Bangladesh (location unclear) | SA | Low income | Both | Children | Cohort study | Clinic | 47 (100%) | Cerebral Palsy | Clinical diagnosis | Attendance at 8–9 distance training package sessions | - | - | 29 | Medium: small sample size |
| Nesbitt et al. (2012) [24] | Bangladesh (Natore, Sirajgani) | SA | Low income | Both | Children | Cross-sectional study | Population | 1308 (100%) | Physical impairment (unspecified) | Clinical assessment | Took up referral | - | - | 50 | Low |
| Ormel et al. (2008) [49] | Various (National) | Various | Various | Both | Not presented | Cross-sectional study | Population | 73,441 (NS) | Musculoskeletal impairment (MSI) | Chronic disorders checklist | Treatment prevalence | 52 | - | - | Low |
| Padmamohan et al. (2009) [26] | India (Kerala) | SA | Low-middle income | Rural | Children | Cross-sectional study | Population | 98 (100%) | Physical impairment (unspecified) | Community health workers assessment | Treatment received | 47 | - | - | Medium: small sample size; unclear measure of disability |
| Raban et al. (2010) [37] | India (Assam, Karnataka, Maharashtra, Rajasthan, Uttar Pradesh, West Bengal) | SA | Low-middle income | Both | Adults | Retrospective study | Population | 9994 (NS) | Arthritis | Self-report (validated) | Treatment coverage | 58 | - | - | Medium: unreliable measure of disability |
| Saleh et al. (2015) [63] | Jordan (Amman) | ME | Upper-middle | Both | Children | Cross-sectional study | Clinic | 116 (100%) | Cerebral palsy | Clinical diagnosis | Proportion who received treatment for a range of problems | Range: 24–100% (median: 50%) | - | - | High: unclear response rate; small sample size; selection bias |
| Schafer et al. (1998) [64] | Chad (Guera prefecture) | SSA | Low income | Unclear | All ages | Cross-sectional study | Clinic | 351 (48%) | Leprosy | Clinical diagnosis | Footwear coverage; treatment completion rate | - | 45 | 73 | High: unclear measure of access; potential for selection bias |

Table 5. Cont.

| | | | | | | | | | | | | | | | |
|---------------------------------|---|-----|-------------------|---------|----------|-----------------------|----------------------|---------------|-----------------------------------|----------------------------|--|------|----|---|--|
| Suman et al. (2015) [65] | India (West Bengal) | SA | Low-middle income | Both | All ages | Cross-sectional study | Population | 43,999 (1.3%) | Arthritis | Self-report (bespoke tool) | Care sought from: qualified provider (private), qualified (public) | 4; 3 | - | - | Medium: unreliable measure of disability |
| Tan et al. (2015) [28] | Malaysia (Penang) | EAP | Upper-middle | Unclear | Children | Cross-sectional study | Registry | 305 (100%) | Physical impairment (unspecified) | Registry | Met need for: Mobility aid (e.g., wheelchair); Physiotherapy | 59 | 44 | - | Medium: low response rate |
| Wanaratwicht et al. (2008) [66] | Thailand (Phrae, Sukhothai, Chiang Rai) | EAP | Low-middle income | Unclear | Adults | Cross-sectional study | Population | 406 (100%) | Physical impairment (unspecified) | Unclear | Proportion who have access to equipment; proportion who have access to physical rehabilitation | 67 | 55 | - | Medium: measure of disability unclear |
| Zongjie et al. (2007) [67] | China (Xincheng, Xuanwu, Beijing) | EAP | Low-middle income | Unclear | All ages | Cross-sectional study | Population, registry | 460 (100%) | Various conditions | Registry | Received rehabilitation in the past 3 months | 27 | - | - | Medium: unclear means of assessing access and disability |

SSA: sub-Saharan Africa, LA: Latin America, SA: South Asia, EAP: East Asia & Pacific, ME: Middle East; EU: Europe.

3.5.4. Access to Rehabilitation for Vision Impairment

In total, 17 studies measured access to rehabilitation for people with visual impairment across 13 countries in four World Bank regions. Table 6 outlines the results of these studies. The method of assessment varied across studies with seven using self-reported tools (of these four used Washington Group), seven using clinical examination, and three using other methods (registry, community leaders).

Thirteen studies measured medical rehabilitation, five studies measured access to assistive devices, and one study measured uptake of referral. Medical rehabilitation for people with visual impairment included consultation with specialist provider, and surgery uptake. All but two studies used a population-based sample. Access to medical rehabilitation was varied, from 5% among people of all ages in Brazil (national) to 82% among people of all ages in Nigeria (subnational). Similarly, results for assistive device coverage were highly variable, but typically low.

Across studies, a clear pattern was not observed by country income group, age, or urban-rural status. Higher coverage was identified for people with higher levels of education in several studies; Kovai et al. (2007), Lee et al. (2013), Palyagi et al. (2008), but not all (Fletcher et al., 1999).

Considering the quality of studies in this category, 12 were judged as having low risk of bias. The remaining five studies had high or medium risk of bias due to low or unclear response rate (four studies), unclear measure of disability (two studies), or unclear measure of access (one study).

3.5.5. Access to Rehabilitation for Any Disability

Table 8 provides the results of 28 studies measuring access to rehabilitation for any disability (i.e., those studies that did not disaggregate by impairment type, or reported overall coverage results). These studies were conducted in 23 countries in six regions: the majority in sub-Saharan Africa (12 studies). Outcomes included access to assistive devices (18 studies), general rehabilitation (22 studies), and adherence (one study). Most studies sampled participants from the population, with one each using clinic or registry as a sampling frame. 21 studies measured disability using self-reported tools, including 12 using the Washington Group questions, two using the Rapid Assessment of Disability tool, and the remainder used bespoke tools. Four studies used a clinical examination. Two studies used registries to identify participants.

Coverage of general rehabilitation varied across studies. Coverage was particularly low in India (subnational) and Bangladesh (subnational) at 5% and 7% respectively. In contrast studies in the Philippines, South Africa, Malaysia, and Brazil (all subnational studies) found higher coverage at 70%, 71%, 76%, and 80%. Substantial variation was also found for access to assistive devices, but generally coverage was low.

There did not appear to be a trend in coverage by country income group. The vast majority of these studies were conducted in both urban and rural areas and did not disaggregate results, thus examining patterns by locality was not possible. Furthermore, most studies were conducted among people of all ages, with no disaggregation of results by age group. Within studies, four studies examined coverage outcomes by indicators of equity. Three studies found lower coverage among females (Hosain et al. (1998), Eide et al. (2006), Eide et al. (2009)), but no consistent patterns by age, socioeconomic status or location were revealed.

Considering the strength of evidence for access to any specialist services, eight studies were judged to have high or medium risk of bias, while the remaining were assessed as having low risk. The main risks were—unclear or unreliable measure of disability (five studies), or low or unclear response rate (five studies).

Table 6. Results of vision specific services.

| Study Author, Year | Country | World Bank Region | Country Income Group | Locality | Age | Type of Study | Participant Source | N (D%) | Method of Assessment | Outcome | Proportion Covered by Type of Rehabilitation % | | | Risk of Bias |
|-------------------------------|------------------------------------|-------------------|----------------------|------------|--------------|-----------------------|--------------------|--------------|--|---|--|------------------|-----------|--|
| | | | | | | | | | | | Medical Rehabilitation | Assistive Device | Adherence | |
| Ahmad et al. (2015) [68] | Pakistan (Karachi) | SA | Low-middle income | Unclear | Older adults | Cross-sectional study | Population | 638 (24%) | Visual acuity assessment; self-reported eye/vision problem | Ever sought treatment (blind; moderate visual impairment; severe visual impairment) | 63; 50; 40 | - | - | Low |
| Bernabe-Ortiz et al. (2016) | Peru (Morropon) | LA | Upper-middle | Semi-urban | All ages | Cross-sectional study | Population | 798,308 (5%) | Washington Group short set | Coverage: Magnifying glasses | - | 33 | - | Medium: low response rate |
| Brian et al. (2012) [69] | Fiji (National) | EAP | Upper-middle | Both | Older adults | Cross-sectional study | Population | 1381 (93%) | Visual acuity assessment and self-report | Consulted a provider (blind; low vision) | 62; 53 | - | - | Low |
| Devendra et al. (2013) [19] | Malawi (Lilongwe) | SSA | Low income | Unclear | Children | Case control study | Clinic | 592 (50%) | WHO ten questions | Proportion of children who attended eye clinic of those in need | 57 | - | - | Low |
| Fletcher et al. (1999) [70] | India (Maduari) | SA | Low income | Rural | Adults | Cross-sectional study | Population | 1039 (34%) | Visual acuity assessment | Attendance at camps for people identified as having need | 7 | - | - | Low |
| Kovai et al. (2007) [71] | India (Andhra Pradesh) | SA | Low-middle income | Rural | Adults | Cross-sectional study | Population | 5573 (22%) | Visual acuity assessment | Sought treatment | 31 | - | - | Low |
| Kuper et al. (2016) [20] | Tanzania (Mbeya, Tanga, Lindi) | SSA | Low income | Both | All ages | Case control study | Population | 254 (50%) | Washington Group short set | Coverage of: White cane; guide | - | 18; 50 | - | Low |
| Lee et al. (2013) [72] | Timor Leste (12 districts) | EAP | Low-middle income | Both | Older adults | Cross-sectional study | Population | 2014 (93%) | Visual acuity assessment | Consulted care provider about vision problem: low vision/blindness; self-reported problem | 25;26 | - | - | Low |
| Maart et al. (2013) [21] | South Africa (Cape Town) | SSA | Upper-middle | Urban | All ages | Cross-sectional study | Population | 151 (100%) | Washington Group short set | Proportion needing medical rehabilitation that received | 57 | - | - | Low |
| Mactaggart et al. (2015) [22] | Cameroon (Fundong Health District) | SSA | Low-middle income | Unclear | All ages | Case control study | Population | 703 (61%) | Washington Group extended set | Coverage of: Magnifying glasses; white cane | - | 15; 33 | - | Low |
| | India (Mahabnagar) | SA | Low-middle income | | | | 845 (60%) | - | | | 46; 0 | - | Low | |
| Mahande et al. (2007) [73] | Tanzania (Hai) | SSA | Low income | Rural | Older adults | Cohort study | Population | 163 (56%) | Visual acuity assessment | Trichiasis surgery uptake (visual impairment; blind) | 47; 41 | - | - | Medium: small sample size, response rate unclear |

Table 6. Cont.

| | | | | | | | | | | | | | | |
|----------------------------|--|-----|-------------------|---------|--------------|---|------------|--------------|-------------------------------------|---|----|----|----|--|
| Malta et al. (2016) [23] | Brazil (National) | LA | Upper-middle | Both | All ages | Cross-sectional study | Population | 204,000 (NS) | Self-report (bespoke tool) | Attendance at rehabilitation services | 5 | - | - | Low |
| Nesbitt et al. (2012) [24] | Bangladesh (Natore, Sirajgani) | SA | Low income | Both | Children | Key informant method initially; then prospective cohort study | Population | 1308 (100%) | Clinical examination | Took up referral | - | - | 31 | Low |
| Palagyi et al. (2008) [74] | Timor Leste (Dili, Bobonaro) | EAP | Low-middle income | Both | Older adults | Cross-sectional study | Population | 1414 (23%) | Visual acuity assessment | Sought treatment from Western Style health services | 29 | - | - | Low |
| Raban et al. (2010) [37] | India (Assam, Karnataka, Maharashtra, Rajasthan, Uttar Pradesh, West Bengal) | SA | Low-middle income | Both | Adults | Retrospective study | Population | 9994 (NS) | Self-report (validated) | Treatment coverage | 21 | - | - | Medium: unreliable measure of disability |
| Tan et al. (2015) [28] | Malaysia (Penang) | EAP | Upper-middle | Unclear | Children | Cross-sectional study | Registry | 305 (100%) | Registry | Met need for: Vision aids; Vision related services | 52 | 47 | - | Medium: low response rate; unclear means of assessing disability |
| Udeh et al. (2014) [75] | Nigeria (Enugu state) | SSA | Low income | Unclear | All ages | Cross-sectional study | Population | 153 (100%) | Recruited through community leaders | Previous eye check; Used low vision device | 82 | 0 | - | High: unclear response rate; unclear measure of access |

SSA: sub-Saharan Africa, LA: Latin America, SA: South Asia, EAP: East Asia & Pacific, ME: Middle East; EU: Europe.

Table 7. Access to any rehabilitation.

| Study Author, Year | Country | World Bank Region | Country Income Group | Locality | Age | Type of Study | Participant Source | Sample Size | Means of Assessing Disability | Outcome | Proportion Covered by Type of Rehabilitation (%) | | | Risk of Bias |
|----------------------------------|---|-------------------|----------------------|------------|---------------|--|--------------------|--------------------|-----------------------------------|--|--|------------------|-----------|--|
| | | | | | | | | | | | General Rehab | Assistive Device | Adherence | |
| Bernabe-Ortiz et al. (2016) [17] | Peru (National) | LA | Upper-middle | Urban | All ages | Cross-sectional study | Population | 798,608 (5%) | Washington Group short set | Any access to a range of rehabilitation services | 11 | | | Low |
| Bernabe-Ortiz et al. (2016) [76] | Peru (Morropon) | LA | Upper-middle | Semi-urban | All ages | Cross-sectional study (with nested case control) | Population | 3684 (8%) | Washington Group short set | Proportion using rehabilitation now among those in need | 5 | | | Medium: low response rate |
| Borker et al. (2012) [77] | India (Goa) | SA | Low-middle income | Rural | Not presented | Cross-sectional study | Population | 936 families (18%) | Bespoke tool/clinical examination | Use of rehabilitation care | 24 | | | High: unclear measure of disability, no response rate reported |
| Danquah et al. (2015) [18] | Haiti (Port-au-Prince) | LA | Low income | Urban | All ages | Case control study | Population | 376 (50%) | Washington Group short set | Met need for specialist health care; medical rehabilitation; specialist advice | 32; 49; 23 | 18 | | Low |
| Devendra et al. (2013) [19] | Malawi (Lilongwe) | SSA | Low income | Unclear | Children | Case control study | Clinic | 592 (50%) | WHO ten questions | Access to: rehabilitation services, assistive devices | 33 | 5 | | Low |
| Eide et al. (2003) [78] | Zimbabwe (National) | SSA | Low income | Both | All ages | Cross-sectional study | Population | 1972 (100%) | Self-report (bespoke tool) | Received rehabilitation; assistive devices | 55 | 36 | | Low |
| Loeb et al. (2004) [43] | Malawi (National) | SSA | Low income | Both | All ages | Cross-sectional study | Population | 1574 (100%) | Self-report (bespoke tool) | Received rehabilitation; assistive devices | 24 | 18 | | Low |
| Eide et al. (2003) [79] | Namibia (National) | SSA | Low-middle | Both | All ages | Cross-sectional study | Population | 2528 (100%) | Self-report (bespoke tool) | Received rehabilitation; assistive devices | 26 | 17 | | Low |
| Eide et al. (2006) [44] | Zambia (National) | SSA | Low income | Both | All ages | Cross-sectional study | Population | 2865 (100%) | Washington Group short set | Received rehabilitation; assistive devices | 37 | 18 | | Low |
| Eide et al. (2009) [80] | Mozambique (National) | SSA | Low income | Both | All ages | Cross-sectional study | Population | 666 (100%) | Washington Group short set | Received rehabilitation; assistive devices | 38 | 18 | | Low |
| Eide et al. (2011) [81] | Swaziland (National) | SSA | Low-middle | Both | All ages | Cross-sectional study | Population | 866 (100%) | Washington Group short set | Received rehabilitation; assistive devices | 31 | 32 | | Low |
| Eide et al. (2016) [82] | Nepal (National) | SA | Low income | Both | All ages | Cross-sectional study | Population | 2123 (100%) | Washington Group short set | Received rehabilitation; assistive devices | 22 | 22 | | Low |
| Eide et al. (2016) [83] | Botswana (National) | SSA | Upper-middle | Both | All ages | Cross-sectional study | Population | 2123 (100%) | Washington Group short set | Received rehabilitation; assistive devices | 33 | 34 | | Low |
| Hamdan et al. (2009) [84] | Palestine (Tulkarm, Qalqilia) | ME | Low-middle | Rural | All ages | Cross-sectional study | Population | 806 (100%) | Clinical examination | Use of equipment | | 19 | | Low |
| Hosain et al. (1998) [85] | Bangladesh (Maniramore Thana, Jessore district) | SA | Low income | Rural | All ages | Cross-sectional study | Population | 1906 (8%) | Head of household report | Sought treatment from qualified provider | 34 | | | Medium: unreliable measure of disability |
| Kisioglu et al. (2003) [86] | Turkey (Isparta) | EU | Low-middle | Both | All ages | Cross-sectional study | Population | 3500 (5%) | Self-report (bespoke tool) | Receipt of rehabilitation | 5 | | | High: unreliable measure of disability; unclear response rate |

Table 8. Access to any rehabilitation.

| | | | | | | | | | | | | | | |
|-------------------------------|---|-----|-------------------|---------|---------------|--------------------------|------------|---------------|--|--|-------|----|---|-----|
| Kuper et al. (2015) [87] | Kenya (Turkana) | SSA | Low income | Unclear | Children | Case control study | Population | 807 (39%) | Washington Group short set | Receipt of rehabilitation | 15 | | Low | |
| Kuper et al. (2016) [20] | Tanzania (Mbeya, Tanga, Lindi) | SSA | Low income | Both | All ages | Case control study | Population | 254 (50%) | Washington Group short set | Coverage of rehabilitation services; specialist health services; assistive devices | 20; 5 | 33 | Low | |
| Maart et al. (2013) [21] | South Africa (Cape Town) | SSA | Upper-middle | Urban | All ages | Cross-sectional study | Population | 151 (100%) | Washington Group short set | Medical rehabilitation; assistive device | 71 | 66 | Low | |
| Mactaggart et al. (2015) [22] | India (Mahabnagar) | SA | Low-middle income | Unclear | All ages | Case control study | Population | 703 (61%) | Washington Group extended set | Met need for medical rehabilitation; assistive devices | 61 | 48 | Low | |
| | Cameroon (Fundong Health District) | SSA | Low-middle income | | | | | 845 (60%) | | | 76 | 44 | | |
| Marella et al. (2014) [88] | Fiji (not specified) | EAP | Upper-middle | Both | Adults | Case control study | Population | 101 (50%) | Rapid Assessment of Disability | Access to rehabilitation; access to assistive devices | 45 | 35 | Low | |
| | Bangladesh (Bogra) | SA | Low income | | | | | 195 (50%) | | | 7 | 12 | | |
| Marella et al. (2016) [89] | Philippines (Quezon, Liago City) | EAP | Low-middle income | Both | Adults | Case control study | Population | 204,000 (6%) | Rapid Assessment of Disability | Access to rehabilitation; Access to assistive devices | 70 | 46 | Low | |
| Nesbitt et al. (2012) [24] | Bangladesh (Natore, Sirajgani) | SA | Low income | Both | Adults | Prospective cohort study | Population | 1308 (100%) | Clinical examination | Uptake of referral | | 48 | Low | |
| Nualnetr et al. (2012) [90] | Thailand (Non Bon, Kosum Phisai, Maha Sarakham) | EAP | Low-middle income | Rural | Not specified | Cross-sectional study | Registry | 99 (99; 100%) | Not specified | Assistive device received and appropriate | | 33 | - | Low |
| Padmamohan et al. (2009) [26] | India (Kerala) | SA | Low-middle income | Rural | Children | Cross-sectional study | Population | 98 (100%) | Community health workers assessment | Use of rehabilitation treatment | 48 | | Medium: small sample size, method of disability assessment unreliable | |
| Pongprapai et al. (1996) [91] | Thailand (Nongjik) | EAP | Low-middle | Unclear | Children | Cross-sectional study | Population | 53 (100%) | Bespoke questionnaire and clinical examination | Sought treatment for child's condition | 62 | | Medium: unclear measure of disability; unclear response rate | |
| Souza et al. (2012) [92] | Brazil (Bahia) | LA | Upper-middle | Urban | All ages | Cross-sectional study | Population | 235 (100%) | Self-report (bespoke tool) | Ever received treatment | 80 | | Medium: unclear measure of disability | |
| Tan et al. (2015) [28] | Malaysia (Penang) | EAP | Upper-middle | Unclear | Children | Cross-sectional study | Registry | 305 (100%) | Registry | Met need for services (specialist doctor; therapy; assistive device) | 76 | | Medium: low response rate | |

SSA: sub-Saharan Africa, LA: Latin America, SA: South Asia, EAP: East Asia & Pacific, ME: Middle East; EU: Europe.

3.5.6. Barriers

Of the 77 included studies, 22 evaluated barriers to accessing rehabilitation as secondary outcomes. Commonly reported barriers included logistical factors (distance to service, lack or cost of transport), affordability (of services, treatment, lack of insurance), and knowledge and attitudinal factors (including perceived need, fear, and lack of awareness about the service) (Table 9). Many of these barriers identified are not unique to disability. However, particular barriers were disability-related, including discrimination from the health provider, provider lacking skills, and communication barriers, or potentially enhanced among people with disabilities (e.g., lack of affordability).

Table 9. Barriers to accessing rehabilitation reported across studies.

| Barrier | Reference |
|---|--|
| Geographic accessibility | |
| Distance to service | [19,21,26,28,31,47,69,71,72,74,93] |
| Transport problems | [18,19,21,28,31,69,72,74,77,84,89,94] |
| Nobody to accompany | [28,69,71,72,74,77,93] |
| Affordability | |
| Unable to afford services | [18–22,26,27,31,47,58,62,67,71,72,74,77,84,89] |
| Unable to afford treatment | [19,47,60,70,75,93] |
| No insurance | [47] |
| Acceptability | |
| Do not know where to go for treatment | [27,28,31,47,48,69,71,72,74,93] |
| Have not heard about service | [75] |
| Thought nothing could be done | [31,48,69–72,74] |
| Lack of perceived need | [20,31,47,48,69–72,74,95] |
| Family do not perceive need | [71] |
| Fear of seeking care | [31,69–72,74] |
| No time/other priorities | [28,47,69–72,74,84,93] |
| Other medical problems | [60,71] |
| Shame | [31,95] |
| Lack of trust in healthcare providers keeping confidentiality | [31] |
| Availability | |
| Waiting time at the clinic | [31,74,77] |
| Not availability of drugs, services | [21,28,60,75,84,93] |
| Quality | |
| Discrimination/poor treatment from health provider | [19,21,28,31,47,69] |
| Poor relationship with provider | [70,71,95] |
| Provider refused care | [28,84] |
| Communication barrier | [21] |
| Provider lacks skills | [28,67] |

4. Discussion

4.1. Review of Findings

This systematic review summarises the available evidence on access to rehabilitation services for hearing (13 studies), visual (17 studies), physical (24 studies) mental (34 studies), and any disability-related service (27 studies). The review captured studies a wide range of World Bank geographic regions, and over 60 countries.

Access results were varied across studies. Access to hearing specific services ranged from 0 to 66%. For visual impairment this was 0 to 82%, physical 0 to 93%, mental 0 to 97% and any disability-related services was 5 to 80%. Despite the variation, overall, access was low; however, there were some outlier studies showing high coverage. The review highlighted that outcomes used to

measure access to rehabilitation, as well as measures of impairment/disability, are varied making comparisons and generalizability difficult. Coverage of services where disability is measured using self-reported tools such as the Washington Group short set of functioning, assumes that people who report difficulties are in need of rehabilitation. This may not be the most accurate measure of coverage (e.g., people blind from cataract may require surgery, not low vision aids) and further work is required to develop standard methods of measurement. Most studies used population-based, cross-sectional data, where the population in need in a particular region were identified (i.e., a prevalence study) and asked about access to services. However, we included studies where participants were sampled from clinics, or registries. These studies are very likely to overestimate coverage given these individuals have already been in touch with some type of service.

In terms of barriers to accessing rehabilitation, common themes across 22 studies in a diverse range of settings included lack of affordability of services, equipment, or medication as reasons for not accessing care. In addition, logistical or geographical factors such as distance to the service, transportation problems, and a lack of a chaperone. Several service-related barriers including discrimination from provider, communication barriers, and lack of provider skill were also common. These barriers may be specific to or greater for people with disabilities than those without disabilities. Further research is needed to examine particular barriers to access that people with disabilities face in greater depth.

The quality of included studies was generally high. There was limited evidence to support an association of coverage with country income group, age, urban-rural location, or other variables such as socioeconomic status. Included studies did not routinely disaggregate results by these variables—with less than a third of studies measuring variables related to equity of coverage.

4.2. Consistency with Previous Reviews

To our knowledge, this is the first systematic review that has attempted to summarize the available evidence on access to health-related rehabilitation for people with disabilities in LMIC. Thus, there are few similar examples from the literature to which the results can be compared.

Several previous reviews have focused on coverage of mental health services, evidence on assistive device coverage, and rehabilitation workforce literature. In a recent scoping review by Matter et al. (2017), authors identified a lack of publications on assistive devices from LMIC, in particular with respect to data on hearing, communication or cognition [96]. Similarly, a previous review by De Silva et al. (2014) on coverage of mental health programs highlighted that there was limited evidence on the topic [97]. They noted coverage estimations varied across studies, making comparisons difficult and called for coverage estimates to be stratified by age, gender, socioeconomic status to understand equity of coverage. These conclusions align with the findings of our review.

Jesus et al. (2017) conducted a review of rehabilitation workforce literature [98]. They found that substantial shortages of rehabilitation workers are documented in low income countries, particularly in sub-Saharan Africa and Latin America—with only six physicians specialized in rehabilitation in sub-Saharan Africa. Few programs exist for obtaining a qualification in rehabilitation, with several studies reporting alternative health worker cadres which could mitigate this; however, there is limited evidence on effectiveness. Although these findings have a health systems perspective on access to health services, they help to explain the reported low coverage of rehabilitation services in many studies in our review. Bruckner et al. (2010) also found that out of 58 LMIC involved in the WHO Assessment Instrument for Mental Health Systems surveys, that the vast majority did not meet expected health workforce targets for delivery of mental health services [99].

Several national surveys have been conducted in high-income countries such as the United Kingdom, the United States, and Korea. In the United States, a nationwide survey of people with cerebral palsy, multiple sclerosis, and spinal cord injury found that nearly one third of those who indicated a need did not receive assistive equipment every time it was needed. Over half of people had an unmet need for rehabilitative services [100]. In Korea, a 2009 nationally representative study

(Korean National Health and Nutrition Examination Survey—KHANES) found that less than 10% of people with depressive mood had used mental health services [101]. In the United Kingdom, analysis of the European Health Interview Survey found that people with severe disability had higher odds of facing unmet need for health care, with the largest gap for mental health care [102]. Although these studies show high unmet need for services also exists in high-income contexts, access to rehabilitation is likely to be much poorer in LMIC.

The WHO have commonly cited statistics on coverage of assistive devices. For instance, it is estimated that hearing aid production meets less than 10% of the global need and less than 3% of people who need hearing aids in LMIC actually receive them. Furthermore, previous WHO estimates suggests that in many LMIC, 5–15% of people with disabilities have access to assistive devices [6]. Our review found wide variation in coverage of hearing aids and assistive devices but does agree that coverage is generally low. Again, the range of measurements of both disability and access limit comparability across studies.

4.3. Implications for Practice

This review has shown that in general, access to rehabilitation services is low in many LMIC. However, evidence is lacking from many countries of the world. To enable full implementation of the UNCRPD, member states must ensure that rehabilitation services are accessible to people with disabilities. Despite the UNCRPD providing a clear legal and regulatory framework, this review alongside key publications from the WHO, suggests that people with disabilities are not receiving a range of specific health services required to improve functioning. Evidence suggests that per capita income is linked to the level of implementation of the UNCRPD—underlining the major challenge for LMIC [103]. As outlined in the call to action in Rehabilitation 2030 there is an urgent need to address the unmet need for these services [5]. Although we have specifically focused on people with disabilities, rehabilitation has a broader scope, with some people needing rehabilitation temporarily at certain points in life (e.g., after a sports injury). Thus, addressing rehabilitation needs for people with disabilities has a wider benefit. Increasing life expectancy means the needs for rehabilitation will also increase, reinforcing the need to address this gap.

Rehabilitation should be integrated in to health systems at all levels to maximize access and achieve UHC. *Rehabilitation in Health Systems* guidance from the WHO provides recommendations for member states to strengthen and expand the availability of quality rehabilitation [104]. These, and other initiatives, include supply-side interventions, which attempt to address the dearth of services available to provide rehabilitation in LMIC. For instance, the GATE program of the WHO aims to improve access to affordable devices globally through various mechanisms [11]. Community-based models of health care delivery have been attempted for specific health services including: mental health, eye care, and ear and hearing care. These task shifting approaches are endorsed by the WHO as a mechanism to overcome skills shortages and reach underserved populations [105]. Telemedicine is a growing area for provision of rehabilitation and may help overcome the geographical barriers commonly reported in the literature. As an example, in the field of hearing impairment, telemedicine has been used for screening, diagnosis, and hearing aid fittings [106]. Furthermore, mobile technology has huge potential for improving access to rehabilitation. For example, in Kenya smartphone-based assistive technologies have been tested for students with visual impairment with positive impact on access to education, and participation in everyday life [107]. Sureshkumar et al. (2015) have tested a smartphone-based educational intervention for people with physical impairments following stroke in India [108].

Furthermore, demand-side interventions such as financial incentives and health promotion/education may help to improve uptake of available services. This includes strategies such as ensuring health insurance covers rehabilitation services, which will help to avoid catastrophic health expenditure. Two systematic reviews conducted by Bright et al. found that delivery of services at or close to home, text-message reminders, and vouchers may be beneficial for improving access to services for children in LMIC, but more evidence is needed on “what works” to improve access for people with disabilities [109,110].

4.4. Implications for Research

Use Common Definitions of Disability and Coverage

To monitor progress towards the SDGs with respect to disability, and for program-planning purposes, key indicators of access to and coverage of rehabilitation should be developed, with a uniform method of measurement to allow comparability. This includes using clear definitions of what is meant by rehabilitation (e.g., medical rehabilitation, assistive technology, and therapy) and how coverage or access are measured. Access to health-related rehabilitation in this review was usually measured in terms of “coverage”, that is the proportion of people needing a service who reported receiving it. However, this may overestimate coverage as the service may be inadequate and/or the full course of treatment may not be completed. Better measures of “access” are therefore needed. Furthermore, common definitions of disability should be adopted. Ideally, this should focus on clinical measurement of impairment, as these will also provide further information about the rehabilitation needs [111]. For instance, self-reported hearing difficulties does not give adequate information about service needs, which may range from basic wax removal to more complex surgeries or hearing aid fitting. Clinical assessment would provide the information needed to plan rehabilitation and specialist services. In addition, equity of service coverage should be assessed as part of any data collection to monitor access to rehabilitation. Sociodemographic information such as age, gender, socioeconomic status, locality, should be collected which can then allow data disaggregation. Monitoring the effectiveness and quality of rehabilitation care received is crucial for informing service delivery improvements, and ensuring functioning is maximized for people with disabilities.

4.5. Limitations and Strengths

This review has several limitations that need to be taken in to account. We focused on literature from peer-reviewed sources, and it is possible that some relevant data is available in grey literature sources, not captured in our search. Although we placed no restrictions on language, the electronic searches were conducted on six databases in the English language, and thus some literature may have been missed. Although our review encompassed a broad range of countries, and all the World Bank regions except for North America (high income), a third of studies came from sub-Saharan Africa. Our results may be slightly biased towards the conditions in these countries. However, the range of countries in sub-Saharan Africa included were limited to 15 of the 48 countries—suggesting that despite the largest proportion of data coming from this region, further research is required. Data was lacking from many parts of the world, with only 16% of included studies from Latin American countries, therefore included studies may not be representative of the level of access to rehabilitation in many LMICs. Studies may have been conducted in countries where stronger rehabilitation services exist, which may exaggerate the results found. The vast majority of studies were conducted at district level (73%), rather than national level, so making inferences about the situation of rehabilitation access in a whole country is limited. In the analysis we compared results by country income level (low, low-middle, and upper-middle). Ideally, a comparison between the results of studies by region (e.g., LMICs in Africa) would have been made, however the range of measurement types used limits comparability. Our review did not have a focus on the availability of services, which is an important dimension of access and may help to explain poor coverage of rehabilitation [112]. The scope of our review was on health-related rehabilitation and does not focus on broader needs such as education or work-related rehabilitation. We also did not include access to sign language education, rather than medical interventions for hearing impairment. Thus, we have not captured access to rehabilitation in its broadest sense as defined in Rehabilitation 2030. This warrants further attention. We did not assess the costs of accessing rehabilitation services, even though financial constraints were a major reason for not seeking care. Finally, we did not place any restrictions on publication date in our review, which means we have captured available literature to date; however, some studies may be outdated, and not reflective of the current level of access in the country studied.

There are also several strengths. This review was large, and adopted a systematic approach, following Cochrane guidelines. We used a comprehensive list of search terms to capture the literature available on this topic. It captured a broad range of disability types, and across a diverse range of countries and published in different languages.

5. Conclusions

This systematic review on access to rehabilitation for people with disabilities found wide variation in reported coverage across studies. In general, coverage appeared to be low for medical rehabilitation, assistive devices, therapy, and adherence. However, the review has identified a need to develop standard indicators for measuring coverage of rehabilitation to allow comparability. There is also a need to use comparable measures of disability. Common measures will contribute towards a greater understanding of the met and unmet needs for rehabilitation for people with disabilities and allow planning of appropriate services.

Supplementary Materials: The following are available online at <http://www.mdpi.com/1660-4601/15/10/2165/s1>, Table S1: EMBASE search strategy.

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