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Bouncing Back and Valuing the Self: A Narrative Review of Resilience and Self-Esteem among Young Adults with Locomotor Disability

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ABSTRACT:

Background: Young adults with locomotor disability face the usual tasks of early adulthood, such as completing education, finding work and forming relationships, together with physical barriers, stigma and restricted participation. Resilience and self-esteem are two personal resources that may help them adapt, but the evidence on these resources in this group has not been brought together.

Objective: This narrative review examines what is known about resilience and self-esteem among persons with physical, and particularly locomotor, disability; how the two constructs relate to each other; which personal and social factors shape them; and what this means for research and practice in India.

Method: Peer-reviewed articles, systematic reviews, national reports and standard texts were identified through searches of PubMed, Google Scholar and publisher databases, using combinations of terms for resilience, self-esteem, physical or locomotor disability, and young adults. Studies were selected for relevance and synthesised thematically.

Findings: Persons with physical disabilities report more psychological distress and, on average, lower self-esteem than non-disabled peers, although the gap narrows when social support is high and economic hardship is low. Resilience after physical disability is common rather than exceptional, and it predicts better mood, social functioning and quality of life. Resilience and self-esteem are consistently and positively related in student samples, and one study of adults with locomotor disability in India found that self-esteem strongly predicted resilience. Social support, self-efficacy, acceptance of disability, education, physical activity and sport participation are linked to higher levels of both resources, while internalised stigma and perceived devaluation are linked to lower levels.

Conclusion: Resilience and self-esteem appear to be closely connected and modifiable resources that depend more on social conditions than on impairment. The evidence, however, is mostly cross-sectional, uses inconsistent measures and comes largely from outside India, where studies are few, small and lack comparison groups. An integrative framework and a seven-point research agenda are proposed, prioritising comparative and longitudinal studies of young adults with and without locomotor disability, Hindi validation of brief measures and culturally adapted interventions.

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1. INTRODUCTION

Disability is part of the human condition. The World Health Organization estimates that about 1.3 billion people, roughly one in six people worldwide, live with a significant disability (World Health Organization [WHO], 2022). In India, the 2011 Census recorded about 2.68 crore persons with disabilities, of whom disability in movement formed the largest single group at 20.3% (Ministry of Statistics and Programme Implementation [MoSPI], 2016). A later national survey placed overall disability prevalence at 2.2% (National Statistical Office [NSO], 2019).

The Rights of Persons with Disabilities Act, 2016 recognises locomotor disability as a condition in which damage to the musculoskeletal system, the nervous system, or both limits a person's ability to move their body or handle objects (Government of India, 2016). Common causes include the after-effects of polio, cerebral palsy, amputation, spinal cord injury, muscular dystrophy and congenital limb differences.

Living with a locomotor disability involves more than physical limitation. People often meet inaccessible buildings and transport, negative attitudes, reduced access to education and employment, and repeated reminders that they differ from social norms. These experiences carry psychological costs. In a large United States survey, frequent mental distress was reported by 32.9% of adults with disabilities compared with 7.2% of adults without disabilities (Cree et al., 2020). Yet poor mental health is not inevitable. Among young Australians, the mental health gap between those with and without disabilities almost disappeared when social support was high and financial hardship was low (Honey et al., 2011). Many persons with serious and lasting disabilities also report a good quality of life, a pattern that has been called the disability paradox (Albrecht & Devlieger, 1999).

These findings shift attention from what disability takes away to what helps people adapt. Two personal resources are central in this regard. **Resilience** refers to the capacity to recover from stress and adversity (Smith et al., 2008). **Self-esteem** refers to a person's overall evaluation of their own worth (Rosenberg, 1965). Both have well-documented links with mental health in the general population (Hu et al., 2015; Sowislo & Orth, 2013), and both are plausibly shaped by the experience of disability.

Young adulthood deserves particular attention. Arnett (2000) described the years from about 18 to 25 as "emerging adulthood," a distinct stage marked by identity exploration, instability and gradual movement toward adult roles. For young people with locomotor disability, these transitions may be harder: choices about higher education, work, independent living and relationships can be limited by physical and social barriers at exactly the time when a stable sense of self is being formed.

Despite this, research on resilience and self-esteem has relied mostly on non-disabled student samples, and disability research has often focused on older adults, children or clinical rehabilitation settings. Evidence from India is especially limited. This review therefore brings together research on resilience and self-esteem among persons with physical, and particularly locomotor, disability. It has four aims:

1. To summarise how resilience and self-esteem are defined and measured.
2. To review evidence on resilience and self-esteem among persons with physical and locomotor disability, compared with non-disabled peers where possible.
3. To examine the relationship between resilience and self-esteem and the factors that shape both.
4. To identify gaps in the Indian evidence and suggest directions for research and practice.

2. METHOD OF THE REVIEW

This is a narrative review. A narrative design was chosen because the evidence on resilience and self-esteem in locomotor disability is spread across rehabilitation, disability studies, positive psychology and public health, and uses varied designs and measures that do not suit statistical pooling.

Sources. Literature was identified through PubMed, Google Scholar and the websites of major publishers (Elsevier, Springer, SAGE, Wiley, MDPI, Frontiers and BMC). Indian journals and government reports were also searched to capture national evidence, and the reference lists of key articles were checked for further studies.

Search terms. Searches combined three groups of terms: (a) *resilience*, *bouncing back*, *psychological adaptation*; (b) *self-esteem*, *self-worth*, *self-concept*; and (c) *locomotor disability*, *physical disability*, *mobility impairment*, *spinal cord injury*, *amputation*, *orthopedic disability*. Terms such as *young adults*, *university students* and *India* were added to narrow the results.

Selection. Studies were included if they (a) were published in English in peer-reviewed journals, or were national reports or standard texts; (b) examined resilience, self-esteem or both; and (c) involved persons with physical or locomotor disability, or provided foundational evidence on the constructs or their relationship in young adults. Studies focusing only on intellectual, sensory or psychiatric disability were excluded. Priority was given to systematic reviews, meta-analyses, large or longitudinal studies, and studies with a non-disabled comparison group.

Synthesis. Findings were organised thematically under the review's aims. Because this is a narrative review, no formal quality scoring or meta-analysis was carried out, and the selection of studies may not be exhaustive.

3. CONCEPTUAL FOUNDATIONS

3.1 Resilience: from rare trait to ordinary process

Early resilience research focused on children who did well despite serious risk, and resilience was often treated as an unusual personal quality. Later work changed this view. Luthar et al. (2000) described resilience as a dynamic process of positive adaptation in the context of significant adversity, and stressed that both the adversity and the adaptation must be clearly defined. Masten (2001) showed that resilience is common and grows out of everyday adaptive systems, such as close relationships, problem-solving skills and self-regulation, which she called "ordinary magic" (p. 227). Bonanno (2004) found that after loss or trauma, a stable pattern of healthy functioning is the most frequent response rather than an exception. Rutter (2012) added that resilience is not fixed: a person may show it in one situation and not in another, depending on the adversity and the resources available.

Fletcher and Sarkar (2013) reviewed these definitions and noted two broad approaches. Some researchers treat resilience as a trait, a stable set of personal qualities, while others treat it as a process or outcome of adaptation. This distinction matters for measurement. Many scales assess protective resources, such as optimism, social support or personal competence, rather than recovery itself. Smith et al. (2008) argued that the original meaning of resilience is the ability to recover, and developed the six-item Brief Resilience Scale (BRS) to measure this capacity directly. A methodological review of 19 resilience measures rated the Connor-Davidson Resilience Scale, the Resilience Scale for Adults and the BRS as having the best psychometric properties (Windle et al., 2011).

For disability research, the outcome-focused view has an advantage. Because persons with and without disabilities may differ in the resources available to them, a measure of recovery allows a fairer comparison than a measure of resources.

3.2 Self-esteem: global self-worth and social acceptance

Rosenberg (1965) viewed self-esteem as the favourable or unfavourable way in which people evaluate themselves as a whole, and his 10-item scale remains the most widely used measure of global self-esteem. Self-esteem matters for mental health. A meta-analysis of longitudinal studies found that low self-esteem predicts later depression and, to a lesser degree, anxiety (Sowislo & Orth, 2013). A review of prospective evidence concluded that high self-esteem has beneficial effects on relationships, work and health (Orth & Robins, 2022). Mann et al. (2004) argued that self-esteem is a core target for mental health promotion because it influences health behaviours and protects against distress.

Two theories explain how social experience shapes self-esteem. The sociometer hypothesis proposes that self-esteem acts as an internal gauge of how much a person is accepted or rejected by others (Leary et al., 1995). From this view, exclusion should lower self-esteem. However, Crocker and Major (1989) showed that members of stigmatised groups do not always have lower self-esteem, because they can protect it, for example by attributing negative treatment to prejudice rather than to personal failings, or by comparing themselves with others in the same group.

3.3 Models of disability

How disability is understood shapes how resilience and self-esteem are interpreted. The medical model locates disability in the person's impairment. The social model locates it in barriers created by society. The International Classification of Functioning, Disability and Health combines these views, describing disability as the outcome of interaction between a health

condition, personal factors and environmental factors (WHO, 2001). Livneh and Antonak (2005) described psychosocial adaptation to chronic illness and disability as an evolving process shaped by both the person's resources and their context.

The concept of disability identity adds a further layer. Dunn and Burcaw (2013) described how many disabled people come to see disability as part of who they are and develop a sense of belonging to a disability community, which can protect self-worth. Bogart (2014) found that disability self-concept was linked to adaptation and that this link differed between people with congenital and acquired disabilities. Together, these perspectives suggest that resilience and self-esteem in locomotor disability depend not only on the impairment but on social context, personal meaning and identity.

3.4 Measuring resilience and self-esteem

The choice of instrument shapes what a study can conclude. Resilience scales fall into two families: those that measure the **outcome** of recovery and those that measure the **resources** that make recovery possible. Comparing groups on a resource scale can confuse lower resilience with fewer available resources, a particular risk when persons with disabilities face restricted social and economic opportunities. Self-esteem measurement is more settled, with the Rosenberg scale dominating the field. Table 1 summarises the instruments most often used in the studies reviewed here.

Table 1: Commonly Used Measures of Resilience and Self-Esteem

Instrument	Items	What it measures	Focus	Use in India
Brief Resilience Scale (Smith et al., 2008)	6	Ability to recover from stress	Outcome	Used with Haryana students (Barmola & Saini, 2024); no validated Hindi version located
Connor-Davidson Resilience Scale, CD-RISC-25 (Connor & Davidson, 2003)	25	Personal qualities that support thriving under adversity	Resources	Hindi version validated (Singh et al., 2018); licence required
CD-RISC-10 (Campbell-Sills & Stein, 2007)	10	Shortened, single-factor version of the CD-RISC	Resources	Licence required
Resilience Scale for Adults (Friborg et al., 2003)	33	Personal, family and social protective factors	Resources	Limited Indian use
Resilience Scale (Wagnild & Young, 1993)	25	Personal competence and acceptance of self and life	Resources	Licence required
Rosenberg Self-Esteem Scale (Rosenberg, 1965)	10	Global self-worth	–	Public domain; Hindi version validated (Aachal et al., 2024)

Two further measurement concerns follow. First, few studies test whether a scale measures the same construct in disabled and non-disabled groups, which is required before their scores can be fairly compared. Second, items written for non-disabled populations may carry different meaning for people whose daily lives involve physical limitation, for example items about coping with physical challenges or being in control of events.

4. RESILIENCE AMONG PERSONS WITH PHYSICAL AND LOCOMOTOR DISABILITY

4.1 Resilience is common after physical disability

Studies of spinal cord injury, one of the most studied forms of acquired locomotor disability, show that resilience is the typical response rather than the exception. Bonanno et al. (2012) tracked depression and anxiety in adults after spinal cord injury and found that a resilient pattern of stable, low symptoms was the most common trajectory, seen in more than half of patients. In an Australian longitudinal study of 88 adults with spinal cord injury, about 70% were classified as resilient at discharge from rehabilitation and 66% six months later (Guest et al., 2015).

4.2 Levels compared with the general population

When resilience scores are compared with those of the general population, persons with physical disabilities score only slightly lower. Terrill et al. (2016) studied adults with long-term physical disabilities, including spinal cord injury, post-polio syndrome, multiple sclerosis and muscular dystrophy, and found resilience slightly below general-population norms. Resilience was lower among those with depression and among younger and middle-aged participants, and it differed by condition. These findings suggest that disability does not by itself remove the capacity to recover, although certain conditions and life stages may bring greater strain.

4.3 Resilience as a protective factor

Resilience is linked to better outcomes in persons with disabilities. In a three-year study of 1,594 community-dwelling adults with multiple sclerosis, muscular dystrophy, post-polio syndrome or spinal cord injury, higher baseline resilience predicted fewer depressive symptoms and better social functioning over time (Silverman et al., 2015). In a Spanish sample of adults with physical disability, resilience mediated the negative effect of internalised stigma on psychological quality of life (Silván-Ferrero et al., 2020). In other words, people who had absorbed negative views about disability reported poorer well-being, but this effect was weaker among those with higher resilience.

4.4 What supports resilience

Reviews of spinal cord injury research point to a consistent set of factors. An integrative review of 11 studies found that social support, self-efficacy, spirituality, adaptive coping, life satisfaction and post-traumatic growth were associated with higher resilience, while stress, anxiety, depression and an external locus of control were associated with lower resilience (Bhattarai et al., 2021). Findings on age, gender, pain and functional independence were inconsistent. In the Australian longitudinal study, self-efficacy and low negative mood were the strongest predictors of resilience, while demographic and injury characteristics added little (Guest et al., 2015).

Participation in adapted sport is another source of resilience. A systematic review of 27 studies concluded that adapted sport had a positive effect on the well-being, resilience and social support of people with disabilities (Mira et al., 2023).

4.5 Summary

Resilience after physical disability is common, only slightly lower on average than in the general population, and closely tied to mood, social functioning and quality of life. It depends more on psychological and social resources, especially self-efficacy and social support, than on the type or severity of impairment. Most of this evidence, however, comes from older adults and acquired conditions in Western countries.

5. SELF-ESTEEM AMONG PERSONS WITH PHYSICAL AND LOCOMOTOR DISABILITY

5.1 Comparisons with non-disabled peers

Studies that include a comparison group generally find lower self-esteem among persons with physical disabilities. In a large study of 881 American women, the 475 women with physical disabilities reported lower self-esteem, a less positive sense of how others saw them, and greater social isolation than women without disabilities (Nosek et al., 2003). In India, Mushtaq and Akhouri (2016) compared 50 physically disabled and 50 non-disabled adults and reported lower self-esteem along with higher depression, anxiety and stress in the disabled group.

These differences should not be overstated. Crocker and Major (1989) showed that stigmatised groups often protect their self-esteem, and the disability paradox shows that many disabled people evaluate their lives positively (Albrecht & Devlieger, 1999). The size of the gap is likely to depend on the social environment rather than on disability as such.

5.2 Factors linked to self-esteem

Family and school environment. In Nosek et al.'s (2003) study, less severe disability, a positive school environment, less overprotection by parents and more affection at home were all associated with higher self-esteem among women with disabilities. Education, by contrast, was not related to self-esteem in that sample.

Education, mobility aids and physical activity. Among 582 Saudi adults with physical disabilities, higher education, regular physical activity and use of a mobility aid were associated with higher self-esteem; men scored higher than women,

and self-esteem differed by type of disability, being lowest in multiple sclerosis and cerebral palsy and highest among those with the after-effects of polio (Alhumaid & Said, 2023). The predictors together explained only a modest share of the differences, suggesting that other psychological and social factors are also important.

Acceptance of disability. A four-year follow-up of 3,329 Korean adults with registered disabilities found that people whose acceptance of their disability stayed low were more than twice as likely to have low self-esteem as those whose acceptance stayed high (Jung et al., 2022). Of the individual acceptance items, difficulty getting along with others because of one's disability showed the strongest association with low self-esteem. This finding fits the sociometer view that social acceptance is closely tied to self-worth (Leary et al., 1995).

Stigma and devaluation. Perceived devaluation interacts with self-esteem in shaping mental health. Among adults with physical disabilities, self-esteem and mastery were linked to depressive symptoms in men, and their effects were stronger when men perceived greater devaluation by others (Brown, 2014). Internalised stigma, the acceptance of negative stereotypes about oneself, is associated with poorer psychological quality of life (Silván-Ferrero et al., 2020).

5.3 Summary

On average, persons with physical disabilities report lower self-esteem than non-disabled peers, but there is wide variation. Higher self-esteem is associated with supportive family and school environments, education, physical activity and acceptance of disability, while stigma and perceived devaluation are associated with lower self-esteem. Many of these factors are modifiable, which makes self-esteem a realistic target for intervention.

6. THE RELATIONSHIP BETWEEN RESILIENCE AND SELF-ESTEEM

6.1 Theoretical links

There are good reasons to expect resilience and self-esteem to be connected. According to the transactional model of stress, the impact of a stressor depends on how a person appraises it and whether they believe they can cope (Lazarus & Folkman, 1984). A person who values themselves is more likely to see a setback as manageable and to persist, which supports recovery. In the other direction, repeated experiences of bouncing back from difficulty can strengthen a person's sense of worth and competence. The relationship is therefore likely to be reciprocal rather than one-way.

6.2 Evidence from general and student samples

Studies of young adults consistently report a positive relationship. In 2,574 Peruvian university students, resilience and self-esteem were both positively related to life satisfaction, and self-esteem was its strongest predictor (Vilca-Pareja et al., 2022). Among 676 university students in Oman, self-esteem was one of the significant predictors of resilience measured with the BRS (Al Omari et al., 2023). In Haryana, India, Barmola and Saini (2024) found a moderate positive correlation between BRS and Rosenberg Self-Esteem Scale scores in 150 college students aged 17 to 26 ($r_s = .385$, $p < .01$).

6.3 Evidence from persons with locomotor disability

Direct evidence in locomotor disability is scarce. The clearest study is from Kashmir, where Singh and Wani (2020) assessed 46 adults with locomotor disability using the Rosenberg Self-Esteem Scale and the Connor-Davidson Resilience Scale. Self-esteem strongly predicted resilience, accounting for about two-thirds of its variance. Married participants, those from joint families and those with higher education scored higher on both measures. The study's small purposive sample, lack of a comparison group and some inconsistencies in reporting limit the confidence that can be placed in the exact size of the effect, but the direction is consistent with student research.

Related evidence supports the link. In spinal cord injury, self-efficacy, a construct closely related to self-esteem, is one of the strongest predictors of resilience (Bhattarai et al., 2021; Guest et al., 2015). Among men with physical disabilities, self-esteem helped protect against depression, especially when perceived devaluation was high (Brown, 2014).

6.4 Summary of key studies

Table 2: Key Studies on Resilience and Self-Esteem in Physical Disability and Young Adults

Author (year)	Country and sample	Measures	Key finding
Nosek et al. (2003)	USA; 881 women, 475 with physical disabilities	Self-esteem, social isolation	Lower self-esteem in women with disabilities; family and school factors mattered
Bonanno et al. (2012)	Europe; adults with spinal cord injury	Depression and anxiety trajectories	Resilient trajectory was the most common
Guest et al. (2015)	Australia; 88 adults with spinal cord injury	CD-RISC, self-efficacy, mood	About two-thirds resilient; self-efficacy predicted resilience
Silverman et al. (2015)	USA; 1,594 adults aging with disability	CD-RISC-10, depression, functioning	Resilience predicted better outcomes over three years
Terrill et al. (2016)	USA; adults with long-term physical disabilities	CD-RISC	Resilience slightly below population norms
Mushtaq & Akhouri (2016)	India; 50 physically disabled, 50 non-disabled adults	Self-esteem, anxiety, depression, stress	Lower self-esteem in the disabled group
Silván-Ferrero et al. (2020)	Spain; 288 adults with physical disability	Internalised stigma, resilience, quality of life	Resilience mediated the effect of stigma on quality of life
Singh & Wani (2020)	India; 46 adults with locomotor disability	RSES, CD-RISC	Self-esteem strongly predicted resilience
Jung et al. (2022)	South Korea; 3,329 adults with disabilities, 4-year panel	Acceptance of disability, RSES	Persistently low acceptance doubled the odds of low self-esteem
Alhumaid & Said (2023)	Saudi Arabia; 582 adults with physical disabilities	RSES, physical activity	Education, activity and mobility aids linked to higher self-esteem
Mira et al. (2023)	Systematic review; 27 studies	Well-being, resilience, social support	Adapted sport improved resilience and well-being
Barmola & Saini (2024)	India (Haryana); 150 college students	BRS, RSES	Resilience and self-esteem positively correlated

Note. BRS = Brief Resilience Scale; CD-RISC = Connor-Davidson Resilience Scale; RSES = Rosenberg Self-Esteem Scale.

7. FACTORS SHAPING RESILIENCE AND SELF-ESTEEM

The evidence reviewed above points to a set of personal, disability-related and social factors that influence both resources. They are summarised here and brought together in an integrative framework (Figure 1).

Gender. Meta-analytic and cross-cultural evidence shows slightly higher self-esteem in males than females in the general population (Bleidorn et al., 2016; Kling et al., 1999). Among adults with physical disabilities, men again reported higher self-esteem than women (Alhumaid & Said, 2023), and the factors linked to depression differed between men and women (Brown, 2014). Findings on gender differences in resilience after disability are inconsistent (Bhattarai et al., 2021). Women with disabilities may face a double disadvantage of gender and disability, which deserves attention in the Indian context.

Onset, type and severity of disability. People with congenital disabilities grow up with their condition, while those with acquired disabilities must adjust to a sudden loss, and their adaptation follows different paths (Bogart, 2014). Self-esteem and resilience also differ by condition (Alhumaid & Said, 2023; Terrill et al., 2016), and more severe disability has been linked to

lower self-esteem (Nosek et al., 2003). However, impairment characteristics generally explain less than psychological and social factors (Guest et al., 2015).

Social support and family environment. Social support is the most consistent correlate of resilience after spinal cord injury (Bhattarai et al., 2021) and moderates the mental health gap between young people with and without disabilities (Honey et al., 2011). Family behaviour matters too: overprotection is linked to lower self-esteem and affection to higher self-esteem (Nosek et al., 2003). In India, joint family living has been associated with higher self-esteem and resilience among adults with locomotor disability (Singh & Wani, 2020).

Education and employment. Higher education is associated with higher self-esteem and resilience in several studies (Alhumaid & Said, 2023; Singh & Wani, 2020). Persons with disabilities also report lower social capital, including trust and participation, than those without disabilities (Mithen et al., 2015), which may limit the social resources that support both constructs.

Physical activity and sport. Regular physical activity is linked to higher self-esteem among adults with physical disabilities (Alhumaid & Said, 2023), and adapted sport is associated with higher resilience, well-being and social support (Mira et al., 2023).

Acceptance, identity and stigma. Acceptance of disability is a strong longitudinal predictor of self-esteem (Jung et al., 2022), and a positive disability identity can protect self-worth (Dunn & Burcaw, 2013). Internalised stigma and perceived devaluation act in the opposite direction (Brown, 2014; Silván-Ferrero et al., 2020). Resilience appears to buffer the harmful effects of stigma (Silván-Ferrero et al., 2020).

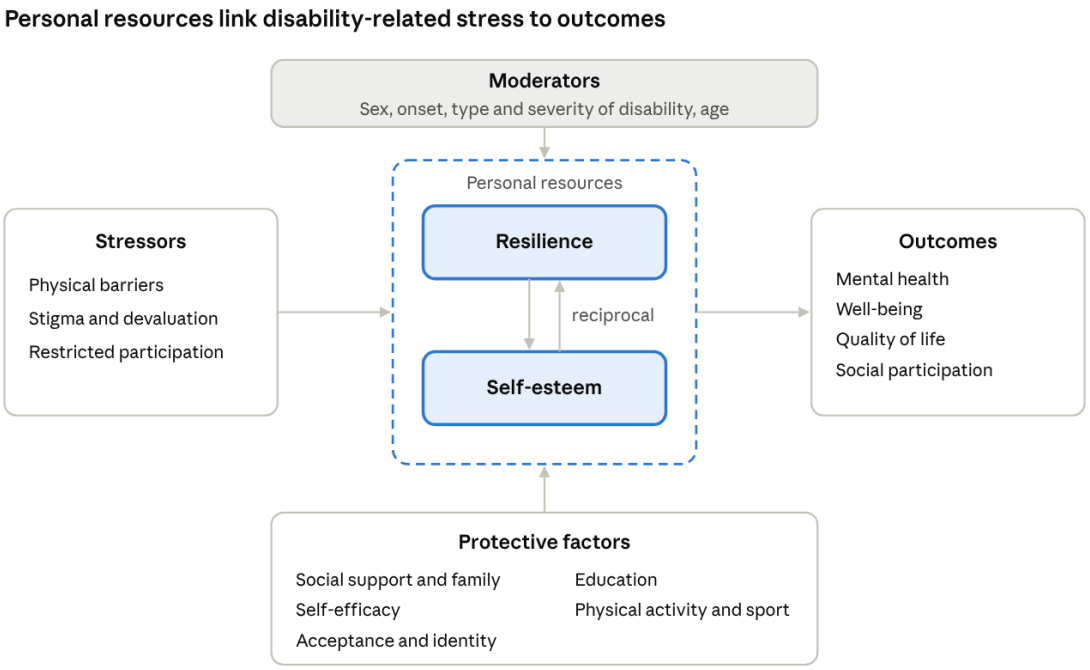

Figure 1. Integrative framework derived from the reviewed literature. Disability-related stressors act on two linked personal resources, resilience and self-esteem, which in turn shape mental health and well-being. Protective factors strengthen both resources, and individual characteristics may change the strength of these links.

8. THE INDIAN CONTEXT

India has one of the largest populations of persons with disabilities in the world, and locomotor disability is its most common form (MoSPI, 2016). The RPwD Act, 2016 expanded the list of recognised disabilities to 21, introduced the concept of benchmark disability (40% or more), and created rights to education, employment and accessibility (Government of India, 2016). Despite this legal progress, psychological research on young adults with locomotor disability remains limited.

Existing studies. The available Indian studies are few and small. Nair et al. (2010) examined psychosocial aspects among 60 adolescents with locomotor disability in Bangalore. Mushtaq and Akhouri (2016) reported lower self-esteem and higher distress in 50 physically disabled adults compared with 50 non-disabled adults. Singh and Wani (2020) found that self-esteem predicted resilience in 46 adults with locomotor disability in Kashmir. Among lower-limb amputees in North India, older participants and men showed better general adjustment, while younger amputees showed poorer general and social adjustment (Kumar et al., 2023). In Haryana, resilience and self-esteem were positively correlated among college students without disabilities (Barmola & Saini, 2024).

Measurement. Validated Hindi versions now exist for the Rosenberg Self-Esteem Scale (Aachal et al., 2024) and the Connor-Davidson Resilience Scale (Singh et al., 2018). No validated Hindi version of the Brief Resilience Scale was located, which is a practical gap for researchers in Hindi-speaking states.

Cultural factors. Several features of Indian society may shape resilience and self-esteem in distinct ways. Joint families can provide practical and emotional support, as suggested by Singh and Wani (2020), but family overprotection, which lowers self-esteem in other settings (Nosek et al., 2003), may also be common. Marriage prospects, especially for women, and social beliefs about disability may add to stigma. Religious and spiritual practices, which are linked to resilience after spinal cord injury (Bhattarai et al., 2021), are widespread and may serve as an important coping resource. These possibilities have not yet been tested systematically.

Summary. Indian evidence points in the same direction as international research, but it is based on small, purposive samples, mostly without comparison groups, and rarely focuses on young adults. No study located for this review has compared young adults with and without locomotor disability on both resilience and self-esteem.

9. INTERVENTIONS TO STRENGTHEN RESILIENCE AND SELF-ESTEEM

Because resilience and self-esteem depend largely on modifiable psychological and social factors, both can be strengthened.

Resilience training. A systematic review and meta-analysis of randomised trials found that resilience training programmes produced a moderate improvement in resilience (standardised mean difference = 0.44). Programmes that combined cognitive-behavioural and mindfulness elements showed somewhat larger effects (Joyce et al., 2018). These studies were conducted mainly with non-disabled adults, so programmes would need adaptation for accessibility and for disability-specific stressors.

Self-esteem interventions. An earlier meta-analysis of programmes for children and adolescents found that interventions improved self-esteem, and that programmes aimed directly at self-esteem were considerably more effective than those targeting other outcomes (Haney & Durlak, 1998). Mann et al. (2004) argued that strengthening self-esteem should be a core part of mental health promotion.

Physical activity and adapted sport. Adapted sport is associated with better well-being, resilience and social support among people with disabilities (Mira et al., 2023), and regular physical activity is associated with higher self-esteem among adults with physical disabilities (Alhumaid & Said, 2023). Sport offers repeated experiences of mastery, a social network and a positive identity, all of which can support both resources.

Building acceptance and reducing stigma. Since acceptance of disability predicts self-esteem over time (Jung et al., 2022) and internalised stigma harms psychological quality of life (Silván-Ferrero et al., 2020), counselling that helps people make sense of their disability and challenge negative self-beliefs is likely to be useful. Peer contact with other disabled people may also support a positive disability identity (Dunn & Burcaw, 2013).

Strengthening social and family support. Interventions that work with families to reduce overprotection, and with colleges and workplaces to improve inclusion, address the social conditions that shape both resilience and self-esteem (Honey et al., 2011; Nosek et al., 2003).

No published intervention study targeting resilience or self-esteem among young adults with locomotor disability in India was located for this review.

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10. CRITICAL APPRAISAL, RESEARCH GAPS AND FUTURE DIRECTIONS

10.1 Critical appraisal of the evidence

The evidence reviewed has clear strengths. Several findings rest on large samples (Jung et al., 2022; Nosek et al., 2003), longitudinal designs (Guest et al., 2015; Silverman et al., 2015), trajectory modelling (Bonanno et al., 2012) and systematic reviews or meta-analyses (Bhattarai et al., 2021; Hu et al., 2015; Joyce et al., 2018; Mira et al., 2023). The central conclusions, that resilience is common after physical disability and that resilience and self-esteem are positively linked, are consistent across countries and designs.

Five weaknesses limit what can be concluded:

1. **Design.** Most studies of the resilience–self-esteem relationship are cross-sectional, so direction cannot be established. Where self-esteem "predicts" resilience, the reverse is equally plausible.
2. **Sampling.** Disability samples are often recruited through rehabilitation services, associations or sports clubs. These participants may have more support than disabled people outside such networks, which could overstate resilience.
3. **Heterogeneous conditions.** Many studies combine spinal cord injury, polio, amputation, cerebral palsy and progressive conditions. Because resilience and self-esteem differ by condition (Alhumaid & Said, 2023; Terrill et al., 2016), pooled results may hide important differences.
4. **Measurement.** Studies use different resilience scales, several of which measure resources rather than recovery (Table 1), and almost none test whether scales work equally well in disabled and non-disabled groups.
5. **Context.** Most evidence comes from high-income Western or East Asian countries and from older adults. Indian studies are small, purposive, mostly single-group and sometimes inconsistently reported (e.g., Singh & Wani, 2020), so effect sizes should be interpreted cautiously.

10.2 Research gaps

1. **Few comparative studies.** Most disability studies examine only disabled participants. Without a non-disabled comparison group, it is not possible to say whether levels of resilience and self-esteem are actually lower in persons with locomotor disability.
2. **Neglect of young adults.** Evidence comes mainly from older adults with acquired conditions or from children. Young adults aged 18 to 25, who face key educational and career transitions, are under-studied.
3. **Limited Indian evidence.** Indian studies are small, purposive and mostly single-group. None has compared young adults with and without locomotor disability on both resilience and self-esteem.
4. **Cross-sectional designs.** Almost all studies of the resilience–self-esteem relationship are cross-sectional, so the direction of influence is unknown.
5. **Measurement issues.** Studies use different resilience measures, some assessing resources and others recovery, which makes comparison difficult. Few measures have been validated in Hindi or tested for equivalence across disabled and non-disabled groups.
6. **Few interventions.** No intervention studies targeting these resources among young Indian adults with locomotor disability were found.

10.3 A research agenda

- Comparative studies of young adults with and without locomotor disability, using the same validated measures in both groups.
- Longitudinal studies to test whether self-esteem predicts later resilience, resilience predicts later self-esteem, or both.
- Examination of moderators such as gender, congenital versus acquired onset, severity, family type and education.
- Validation of the Brief Resilience Scale in Hindi and testing whether resilience and self-esteem measures work equally well across disabled and non-disabled groups.

- Development and evaluation of culturally adapted programmes that combine resilience training, self-esteem work and adapted sport.
- Qualitative studies exploring how young Indians with locomotor disability understand recovery and self-worth.

Table 3 turns these directions into specific research questions for Indian researchers.

Table 3: Proposed Research Agenda

Research question	Suggested design	Key measures	Expected contribution
Do young adults with and without locomotor disability differ in resilience and self-esteem?	Comparative cross-sectional study with matched groups	BRS, RSES, demographic and SES data	First Indian comparative baseline
Is the resilience–self-esteem link equally strong in both groups?	Within-group correlations compared across groups (Fisher's z)	BRS, RSES	Tests whether the link generalises to disability
Does self-esteem lead to resilience, or the reverse?	Two- or three-wave longitudinal panel	BRS, RSES at each wave	Direction of the relationship
Do gender, onset and severity change these patterns?	Moderation analysis within the disability group	Certificate-based % disability, onset, gender	Identifies higher-risk subgroups
Do the scales work equally well across groups?	Confirmatory factor analysis and measurement invariance testing	Hindi BRS and RSES	Valid group comparison; Hindi BRS validation
Can both resources be strengthened?	Randomised or quasi-experimental trial of an adapted programme	Resilience, self-esteem, well-being before, after and at follow-up	Evidence for college and rehabilitation services
How do young adults themselves understand recovery and self-worth?	Qualitative interviews with thematic analysis	Semi-structured interview guide	Culturally grounded meaning and new items

10.4 Implications for practice

- **Counsellors and psychologists** can screen for low self-esteem and low resilience and address both together, since they appear closely linked.
- **Colleges and universities**, through equal opportunity cells, can offer peer support, accessible sport and resilience workshops.
- **Rehabilitation centres and NGOs** can add psychological components, such as acceptance-focused counselling and family guidance on avoiding overprotection, to physical rehabilitation.
- **Policy makers** can support accessible sport and inclusive education under the RPwD Act, 2016, as these address the social conditions that shape both resources.

11. CONCLUSION

This review shows that resilience is common among persons with physical disabilities and protects their mental health, that self-esteem is on average lower than in non-disabled peers but varies widely with social circumstances, and that the two resources are positively related. Both depend more on social support, acceptance, education and participation than on the impairment itself, which means both can be strengthened. In India, however, the evidence base remains thin. Well-designed comparative, longitudinal and intervention studies focusing on young adults with locomotor disability are needed to guide counselling, education and rehabilitation for this group.

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