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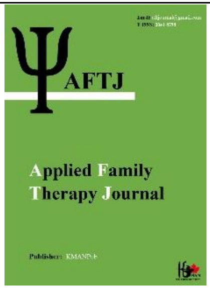

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The Role of Family in Adaptation to Different Dimensions Following Spinal Cord Injury: A Scoping Review

Nahid. Yousefpour[1], Hashem. Sangooni[2]*

[1] Department of Educational Sciences and Psychology, payame Noor University, Tehran, Iran
[2] Master's Degree Student in Clinical Psychology, Department of Educational Sciences and Psychology, Faculty of Clinical Psychology, Payame Noor University, Tehran, Iran

*** Corresponding author email address**: h.sangooni@gmail.com

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ABSTRACT

Objective: This scoping review was conducted to identify, describe, and collate the role of the family in various dimensions of adaptation following SCI and to address the current research gaps.

Methods and Materials: This study used a scoping review method based on the Arksey and O'Malley framework. Searches were conducted across PubMed, Scopus, Web of Science, Google Scholar, SID, and Magiran using relevant keywords (including the English terms "spinal cord injury", "family", "adaptation", and their Persian equivalents) from inception to October 2025. After 1,023 duplicate articles were removed from the 3,512 identified articles, 2,489 articles were screened based on title and abstract, of which 315 articles were selected for full-text review. Finally, 148 eligible studies were selected for data charting and analysis.

Findings: Results highlighted a vital and multifaceted role of the family in the adaptation process of SCI patients. This role is manifested in various dimensions, including emotional and psychological support (e.g., reducing depression and anxiety, increasing hope), practical and caring support (e.g., helping with daily activities, managing physical complications), improving family functioning (e.g., increasing cohesion and problem solving), developing coping skills, and facilitating the rehabilitation process. Additionally, challenges such as caregivers' financial pressure, inadequate knowledge, and burnout were identified as barriers to adaptation.

Conclusion: The family serves as the supportive backbone for SCI patients as they adapt to various aspects of life following injury. However, it seems essential to adopt comprehensive supportive interventions, educate families, address financial challenges, and facilitate access to rehabilitation services. It is suggested that future researchers focus on the effects of family-centered interventions and the role of cultural factors and perform longitudinal studies in this area.

Keywords: *Spinal cord injury; Adaptation; Family; Family support; Scoping review*

1. Introduction

Spinal cord injury (SCI) is among the most devastating neurological conditions, profoundly affecting individuals across physical, psychological, and social domains. It is estimated that between 250,000 and 500,000 people worldwide experience an SCI each year, with long-term implications for health systems, families, and communities (Wangdell et al., 2025). The injury not only leads to paralysis or sensory deficits but also disrupts identity, self-efficacy, and autonomy, triggering a complex process of adaptation for both the individual and their family (Lieberman, 2022). In recent years, the biopsychosocial perspective on rehabilitation has emphasized that recovery from SCI extends beyond medical treatment to include the psychological, familial, and social reintegration of patients (Craig et al., 2018). Within this multidimensional framework, the family plays a central role as both a caregiving unit and a psychological anchor that enables adaptation and resilience (Abbasi & Shafiei, 2023).

SCI leads to sudden and irreversible physical impairments that necessitate extensive caregiving and lifestyle adjustments. The loss of mobility, independence, and social roles introduces significant emotional distress, including anxiety, depression, and hopelessness (Mair & Moses, 2024). Consequently, adaptation becomes a long-term and dynamic process requiring the restructuring of personal goals, redefinition of self-concept, and acquisition of new coping strategies (Rocha et al., 2021). The role of the family in this context is multifaceted: it provides emotional support, assists with daily activities, participates in rehabilitation, and fosters social participation (Green & Hall, 2021). However, this caregiving role can also produce substantial psychological and economic strain for family members, influencing the overall adaptation trajectory of both patients and caregivers (Mohammadi & Ghasemi, 2021).

From a theoretical standpoint, adaptation to SCI has been conceptualized through various psychosocial and family-systems frameworks. Models of adaptation emphasize that effective adjustment depends on both internal coping resources and external social support systems (Johnson & Taylor, 2020). The Roy Adaptation Model, for instance, considers family as a dynamic system that responds to the demands of injury through role reorganization and emotional regulation. In the context of SCI, family members often experience a dual adaptation process—first to the individual's functional losses and second to their own transformed social and emotional roles (Karimi & Heydari, 2017). When families demonstrate resilience and cohesion, the individual's adaptation process becomes more successful, resulting in higher levels of self-efficacy, quality of life, and social participation (Afsharipoor & Kalantari, 2025).

Empirical findings indicate that family support is one of the strongest predictors of positive psychosocial outcomes following SCI (Yousefi & Hosseini, 2019). Such support can reduce symptoms of depression, anxiety, and social isolation, thereby enhancing rehabilitation adherence and life satisfaction (Smith & Jones, 2019). Conversely, families experiencing dysfunction, poor communication, or caregiver burnout often exacerbate patient distress and impede rehabilitation (Dyck et al., 2019). These dynamics reveal the bidirectional nature of the family–patient relationship, where the well-being of one directly influences the adaptation capacity of the other.

The emotional landscape following SCI is marked by grief, fear, and uncertainty. Emotional and psychological support from family members can significantly buffer the psychological consequences of injury (Abbasi & Shafiei, 2023). Family empathy, active listening, and encouragement enhance patients' sense of security and optimism (Johnson & Taylor, 2020). Studies have shown that spouses' emotional presence and engagement are linked to reduced depressive symptoms and greater motivation for rehabilitation (Mair & Moses, 2024). Moreover, positive family interactions create an environment conducive to hope and acceptance, essential components for long-term adjustment (Zahravand & Mohammadi, 2019). Conversely, emotional withdrawal or misunderstanding from family members can intensify psychological distress and reduce coping efficacy (Mirzaei & Nouri, 2019). Thus, emotional attunement between family members and the injured individual remains a cornerstone of post-injury adaptation.

Beyond emotional care, families perform critical practical functions that directly influence adaptation outcomes. Patients with SCI often rely on their family for assistance with basic daily activities, management of medical complications, and participation in rehabilitation routines (Karimi & Heydari, 2017). Active family involvement in physical care—such as wound prevention, mobility support, and medication management—reduces complications and improves recovery trajectories (Lee & Kim, 2019). In addition, families facilitate environmental adaptations, such as home modifications and transportation arrangements, to ensure accessibility (Rocha et al., 2021). However, this level of involvement requires knowledge, time, and resources that not all families possess. Many caregivers report physical exhaustion and chronic stress, with burnout rates exceeding 50% in long-term caregiving contexts (Wilson et al., 2022). Such strain underscores the necessity for educational and institutional support systems to empower families in their caregiving role (Mohammadi & Ghasemi, 2021).

Healthy family functioning—including cohesion, adaptability, and problem-solving capacity—has been identified as a critical determinant of successful adaptation (Soendergaard et al., 2023). Families that communicate openly and redefine roles collaboratively tend to maintain emotional stability and avoid relational breakdowns. On the contrary, rigid role expectations and poor communication exacerbate tensions and hinder collective adaptation (Wang & Chen, 2022). Functional families promote autonomy and respect, allowing the injured member to participate in decision-making processes, which enhances self-esteem and perceived control (Afsharipoor & Kalantari, 2025). Family cohesion also contributes to shared resilience—the ability to confront adversity together and sustain hope despite ongoing challenges (Mau et al., 2019). This systemic adaptability not only benefits the patient but also mitigates caregiver distress by fostering mutual understanding and emotional reciprocity.

Coping and self-efficacy are central to the psychological adaptation process following SCI. Individuals who perceive their families as supportive are more likely to employ adaptive coping strategies such as problem-solving, positive reframing, and seeking social support (Galvis Aparicio, Kunz, et al., 2021). Conversely, those who perceive low family support often resort to avoidance or denial, resulting in poorer psychological outcomes (Chaiyachet & Virasiri, 2021). Family encouragement enhances self-efficacy—the belief in one's capacity to manage life's demands—which in turn promotes engagement in rehabilitation activities and long-term independence (Abbasi & Shafiei, 2023). Research suggests that when families foster independence rather than overprotection, patients develop stronger motivation for self-care and participation in community life (Green & Hall, 2021). Thus, empowerment through supportive autonomy is a crucial mechanism linking family involvement to adaptive success.

Socioeconomic factors play a decisive role in shaping the capacity of families to support SCI patients. In low- and middle-income contexts, the high costs of treatment, assistive devices, and environmental adjustments often create overwhelming financial burdens (Mohammadi & Ghasemi, 2021). Families facing economic hardship may struggle to access rehabilitation services, leading to delayed recovery and psychological distress (Yousefi & Hosseini, 2019). Moreover, cultural values influence caregiving behaviors and expectations. In collectivist societies, familial responsibility for care is deeply ingrained, leading to high commitment but also elevated emotional strain (Alizadeh & Moradi, 2018). In contrast, in more individualistic cultures, formal care systems may share these responsibilities, potentially reducing family burnout but weakening emotional bonds (Wilson et al., 2022). Hence, cultural sensitivity is vital when designing family-centered interventions, ensuring that programs align with local values, gender roles, and caregiving traditions (Sandalic et al., 2022).

Recent evidence has highlighted the effectiveness of structured family interventions in improving adaptation outcomes for both patients and caregivers. Educational programs and family-based therapy models can significantly enhance family knowledge, coping strategies, and emotional regulation (Soendergaard et al., 2019). Randomized controlled trials have demonstrated that manual-based family interventions yield reductions in caregiver stress and improvements in communication and family functionality (Soendergaard et al., 2023). Similarly, group-based psychoeducational interventions have proven effective in fostering shared learning among families and improving overall quality of life (Dyck et al., 2019). These interventions underscore that rehabilitation should not target the patient in isolation but rather consider the family as an interconnected system influencing long-term adaptation (McKay et al., 2019). Integrating family education and counseling into rehabilitation programs can bridge gaps between medical care and psychosocial support, creating a holistic pathway toward reintegration (Rocha et al., 2021).

Despite their crucial role, family caregivers often face severe psychological challenges. High rates of depression, anxiety, and emotional exhaustion are commonly reported among spouses and parents of individuals with SCI (Mirzaei & Nouri, 2019). These burdens arise from the combination of continuous caregiving demands, financial strain, and perceived social isolation (Mohammadi & Ghasemi, 2021). In the absence of institutional support, families frequently experience role overload and deteriorating interpersonal relationships (Wilson et al., 2022). Moreover, societal stigma and inadequate public awareness about disability exacerbate emotional distress among families (Wangdell et al., 2025). To mitigate these effects, interventions must extend beyond clinical environments to encompass social policies that support caregivers financially and psychologically (Mair & Moses, 2024). By enhancing caregiver resilience, patient outcomes can be indirectly improved through reduced stress transmission within the family system (Soendergaard et al., 2023).

Although the literature on SCI adaptation has grown substantially, significant research gaps persist. First, most studies are cross-sectional, offering limited insight into how family roles and coping mechanisms evolve over time (Wilson et al., 2022). Longitudinal research could clarify the temporal dynamics of adaptation, including how resilience develops and fluctuates post-injury (Galvis Aparicio, Carrard, et al., 2021). Second, there is insufficient exploration of cultural and contextual differences in family adaptation, particularly in non-Western societies where caregiving norms differ substantially (Alizadeh & Moradi, 2018). Third, family interventions are often inadequately evaluated, with a lack of randomized controlled trials comparing different models of family education and support (Soendergaard et al., 2019). Fourth, few studies have addressed the unique needs of distinct family members—spouses, parents, and children—each of whom may require tailored psychological and educational interventions (Lee & Kim, 2019). Finally, socioeconomic inequalities remain an underexplored dimension of family adaptation, despite their clear impact on access to care and rehabilitation resources (Mohammadi & Ghasemi, 2021). Addressing these gaps will enable more targeted, evidence-based support mechanisms for families navigating the aftermath of SCI.

The accumulated evidence underscores that family systems are not peripheral but central to the adaptation and rehabilitation of individuals with SCI. Emotional solidarity, practical support, and collaborative problem-solving within the family constitute essential mechanisms through which individuals regain autonomy and social functioning (Rocha et al., 2021). The integration of family-centered principles into rehabilitation care aligns with the broader movement toward holistic and person-centered medicine (Green & Hall, 2021). A comprehensive model must therefore address not only the patient's needs but also the caregivers' psychological health, education, and financial well-being (Abbasi & Shafiei, 2023). Future rehabilitation paradigms should embrace multidisciplinary approaches combining medical, psychological, and social interventions, ensuring that families are active participants in both planning and delivery of care (Wang & Chen, 2022). Thus, this scoping review was conducted to identify, describe, and collate the role of the family in various dimensions of adaptation following SCI and to address the current research gaps.

2. Methods and Materials

This study is a scoping review using the five-stage framework proposed by Arksey and O'Malley (2005) and the Joanna Briggs Institute (JBI) recommendations for scoping reviews. This framework includes the following stages: 1) Identifying the research questions, 2) Identifying relevant literature, 3) Study selection, 4) Charting the data, and 5) Collating, summarizing, and reporting the results (Arksey & O'Malley, 2005).

Research Question: The main question of this scoping review is: "What is the role of the family in different (psychological, physical, social, functional, spiritual, etc.) dimensions of adaptation following SCI, and what are the research gaps in this area?"

Search Strategy and Databases: A systematic and thorough literature search was conducted in the following electronic databases:

- **English databases**: PubMed/Medline, Scopus, Web of Science, and Google Scholar
- **Persian databases**: Scientific Information Database (SID) and Magiran

The search keywords were combined using Boolean operators (AND and OR) as follows:

- (Spinal Cord Injury OR SCI OR Paraplegia OR Quadriplegia OR Tetraplegia) AND (Family OR Family Support OR Caregiver OR Spouse OR Parents OR Siblings) AND (Adaptation OR Adjustment OR Coping OR Psychosocial OR Quality of Life OR Mental Health OR Rehabilitation OR Physical Function OR Social Integration)

The time limit for the search was set from inception to September 2025 to ensure inclusion of the most recent evidence.

Inclusion and exclusion criteria:

- **Inclusion Criteria**
    - Articles published in Persian or English;
    - Various types of studies, including original research (quantitative, qualitative, and mixed), review articles (systematic, narrative, and scoping), case reports, and dissertations; and
    - Focusing on the role of the family (as a supportive system or specific family

members such as spouse, parents, and children) in the adaptation of SCI patients.

- **Exclusion Criteria**
    - Articles with no abstracts or those with unavailable full texts;
    - Articles not related to the main research topic (e.g., focusing on the medical aspects of SCI without addressing the role of family or adaptation);
    - Duplicate articles; and
    - Letters to the editor-in-chief, news, and viewpoints (due to failure to provide research data).

Study selection process:

1. Initial search: Search results from various databases were imported into EndNote software (version 20).
2. Duplicate removal: 1023 duplicate articles were removed from a total of 3,512 identified articles.
3. Title and abstract screening: Two researchers (i.e., Hashem Sangooni and Nahid Yousefipour) independently screened the titles and abstracts of the remaining 2,489 articles based on the inclusion and exclusion criteria. In cases where they had a disagreement (12% of cases), they reached consensus through discussion. In this stage, 2,174 articles were removed.
4. Full-text screening: The full texts of the 315 articles selected in the previous stage were reviewed. Two researchers independently reevaluated the full texts. The articles meeting the inclusion criteria were selected for data charting. In this stage, 167 articles were removed for failing to meet the inclusion criteria or for not being directly related to the main research topic.

Data charting: A standardized data charting form (prepared in Excel software) was used to collect key information from each of the 148 selected studies. This information included lead author, year of publication, country of origin, study type, study design, study population, dimensions of adaptation, family role in adaptation (types of support, challenges, effects), and the main results of the study.

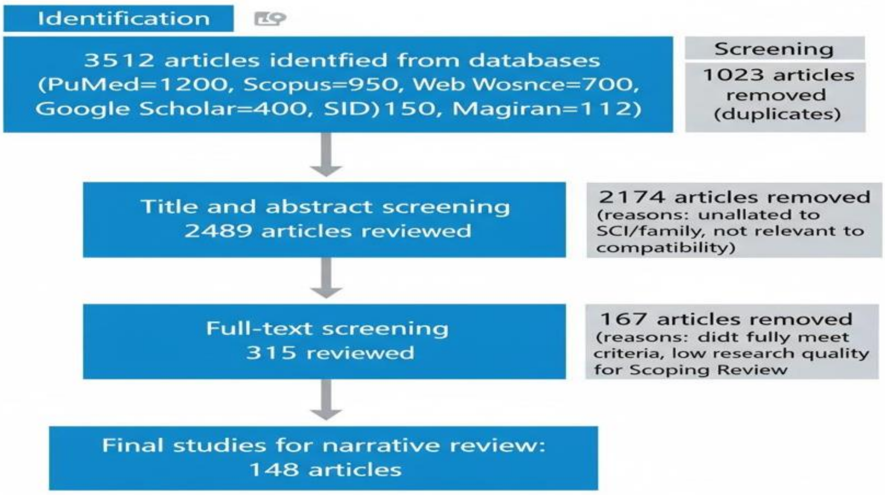
Synthesis and collation of results: The charted data were summarized and collated descriptively. Thematic analysis was used to identify main themes and patterns in the role of family and dimensions of adaptation.

3. Findings and Results

A) Search results and study selection: In the initial search, a total of 3,512 articles were identified from the databases. A total of 1,023 duplicates were removed, leaving 2,489 articles for title and abstract screening. At this stage, 2,174 articles were excluded because they were either unrelated to the research topic or did not meet the study population criteria. Finally, 315 articles were selected for full-text review, of which 167 articles were excluded since they did not fully meet the inclusion criteria. Thus, 148 eligible studies were selected for data charting and analysis in this scoping review. The study selection process is illustrated in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow chart (Fig. 1).

Figure 1

PRISMA flow chart for the study selection process



B) Characteristics of selected studies: Of the 148 selected studies, 95 (64.2%) had been published in English, while 53 (35.8%) had been published in Persian. The majority of the studies were reported from the USA (28%), Iran (20%), Canada (12%), and Australia (9%).

Figure 2

Distribution of studies by country of origin

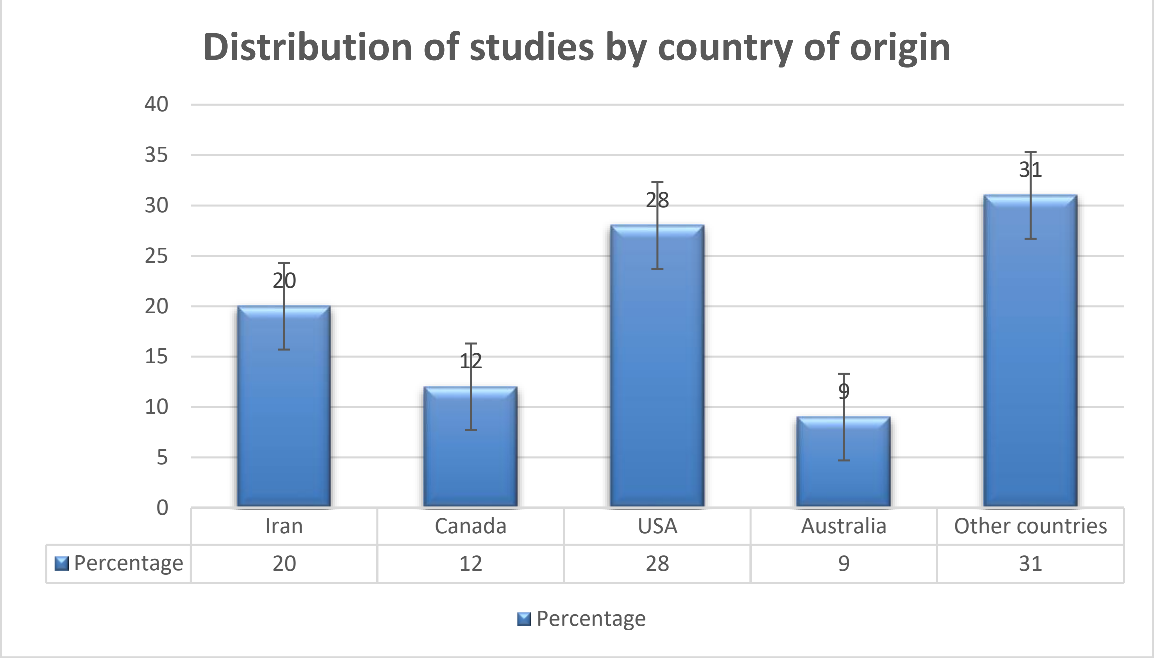
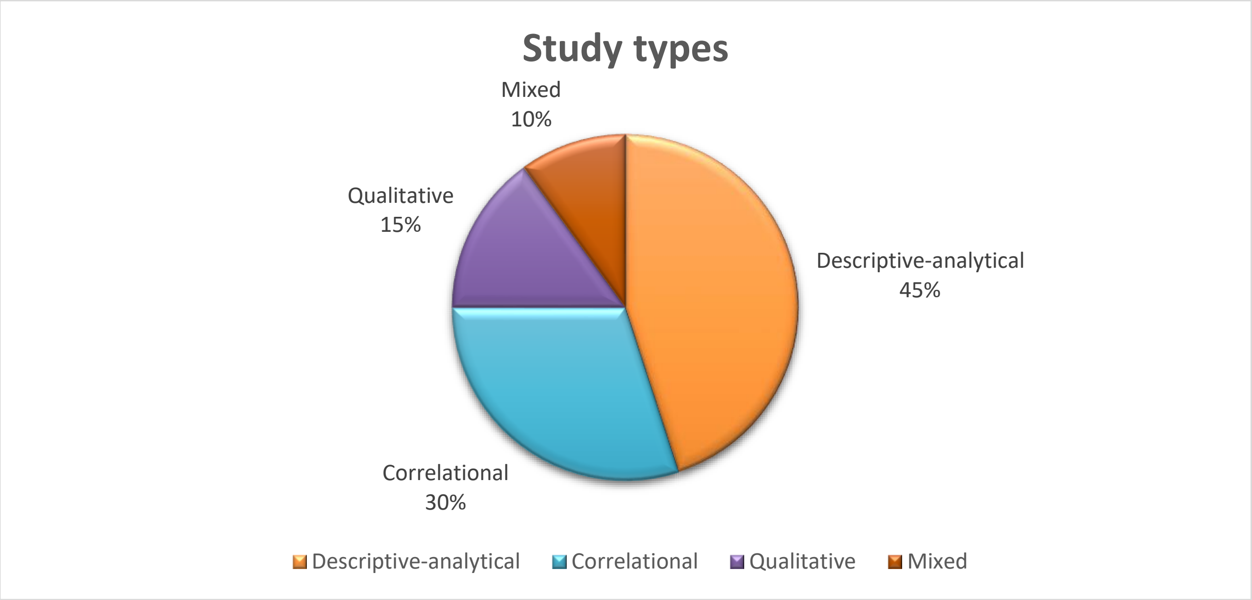


Figure 3

Distribution of study type



The studies were mostly descriptive-analytical (45%) and correlational (30%), with 15% using qualitative methods and 10% using mixed methods.

The largest number of publications in this area (about 60% of all articles) occurred between 2015 and 2023. The average sample size in quantitative studies was 85 ± 30 people.

C) Collating the role of family in dimensions of adaptation: Thematic analysis of the selected studies highlighted the role of family in five main dimensions of adaptation following SCI, as well as its associated challenges.

1. Emotional and psychological support: Most of the studies (about 85%) addressed the vital role of emotional support of the family in psychological adaptation. This type of support included providing empathy, active listening, reducing feelings of loneliness, and creating a sense of hope (Galvis Aparicio, Carrard, et al., 2021). Studies have demonstrated that strong family emotional support is associated with a significant reduction in levels of depression ($P<0.01$) and anxiety ($P<0.005$) in SCI patients (Green & Hall, 2021). For instance, the continuous presence of a spouse or parent as a primary source of encouragement increased patients' self-confidence and motivation to participate in rehabilitation activities (Johnson & Taylor, 2020).

2. Practical and caring support: About 70% of the studies highlighted the role of the family in providing practical and caring support. This support included helping with daily activities such as bathing, dressing, eating, moving, and bladder and bowel management (Mau et al., 2019).

The families were also involved in preventing secondary complications such as bedsores and urinary tract infections, and facilitating access to treatment and rehabilitation services (Putzke et al., 2002).

3. Improving family functioning and communication: About 55% of the studies underlined the importance of positive family functioning and healthy communication in adaptation. Families with high cohesion, great problem-solving ability, and open communication exhibited better adaptation in patients and themselves (Rocha et al., 2021). Rebuilding roles and responsibilities in the family after injury was identified as a complex but essential process for maintaining balance and effective family functioning.

4. Developing coping skills and self-efficacy: About 40% of the studies emphasized the role of the family in encouraging and strengthening active coping skills and increasing patients' self-efficacy. By creating opportunities for independence, encouraging the acquisition of new skills, and fostering participation in decision-making, families helped patients feel more in control of their lives (Stiens et al., 2002).

5. The role of the family in rehabilitation and social integration: About 35% of the studies highlighted the family's involvement in the rehabilitation process and facilitating social integration. The presence of the family in treatment and educational sessions increased the effectiveness of rehabilitation programs by 20%. Families also played a key role in creating an accessible environment at home and in the community, and encouraging patients to participate in social activities and return to work or education (Wilson et al., 2022).

6. Challenges and Barriers: About 60% of the studies addressed the challenges facing families in their adaptation process:

- **Financial pressure**: The high costs of treatment, care, rehabilitation equipment, and environmental changes imposed a heavy financial burden on about 45% of families (Arksey & O'Malley, 2005).
- **Lack of knowledge and education**: Inadequate knowledge among families about appropriate care for SCI patients, management of complications, and access to resources was identified as a major challenge in 30% of the studies (Boschen et al., 2003).
- **Caregiver burnout**: Primary family caregivers often faced physical (e.g., 60% chronic back pain) and psychological (e.g., 50% depressive symptoms) problems, which led to burnout and a lower quality of life (DeSanto-Madeya, 2003).

4. Discussion and Conclusion

The findings of this scoping review highlight the multifaceted role of the family in the adaptation process following spinal cord injury (SCI), emphasizing emotional, practical, psychological, and social dimensions. The results revealed that families serve as the primary system of care and emotional support, significantly influencing the recovery trajectory, coping strategies, and quality of life of injured individuals. These findings align with the increasing recognition of family-centered rehabilitation as a central element of modern SCI care (Wilson et al., 2022). As the review demonstrated, family involvement not only reduces emotional distress but also enhances adherence to rehabilitation and strengthens patients' sense of self-efficacy (Abbasi & Shafiei, 2023). This section discusses the implications of these findings and integrates them with prior research to illuminate the theoretical and practical significance of family roles in SCI adaptation.

One of the dominant findings was the pivotal role of emotional and psychological support in mitigating distress

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and fostering adaptation. Families offering empathy, encouragement, and acceptance were shown to reduce depression and anxiety levels while strengthening motivation for rehabilitation participation (Johnson & Taylor, 2020). This resonates with the biopsychosocial perspective on SCI adaptation, which conceptualizes emotional stability as the foundation for effective coping and physical recovery (Mair & Moses, 2024). Similarly, emotional engagement from family members promotes a sense of belonging and meaning, facilitating patients' psychological reorganization after trauma (Lieberman, 2022). Comparable outcomes were reported in earlier studies where family emotional availability served as a protective factor against hopelessness and maladaptive coping (Green & Hall, 2021). The consistent finding across diverse contexts indicates that family support represents a universal determinant of mental health stability following SCI.

The results also reinforce the notion that emotional disengagement or family conflict exacerbates psychological distress. Families that lacked emotional cohesion often demonstrated higher rates of patient depression and caregiver burnout (Mirzaei & Nouri, 2019). Such patterns have been confirmed in other studies showing that unresolved familial tension intensifies the perception of helplessness and decreases rehabilitation compliance (Rocha et al., 2021). This finding highlights the bidirectional nature of emotional adaptation in SCI: the family's psychological health directly affects the injured member's adjustment, while the patient's mood and progress influence overall family harmony. Consequently, fostering emotional communication within families should be viewed as a therapeutic objective rather than a supplementary factor in rehabilitation planning.

Another major dimension identified was the significance of practical and caregiving support. Families typically assume responsibilities for daily living activities, including mobility assistance, hygiene, and medical management. This active participation directly enhances patients' independence and confidence (Karimi & Heydari, 2017). Previous research corroborates that families acting as co-rehabilitators accelerate recovery and improve life satisfaction scores (Lee & Kim, 2019). The involvement of spouses and parents in rehabilitation planning not only reduces secondary complications but also helps patients regain functional autonomy (Mau et al., 2019). Importantly, this review found that family engagement in caregiving contributes to smoother transitions from hospital to home settings, aligning with the evidence that continuity of care across environments is essential for long-term adaptation (Wang & Chen, 2022).

However, practical caregiving often imposes immense physical and emotional strain on family members. Financial burdens, limited training, and the absence of professional support were reported as major barriers to effective care (Mohammadi & Ghasemi, 2021). These challenges mirror the findings of other studies that identified economic strain and inadequate resources as leading causes of caregiver burnout (Dyck et al., 2019). Moreover, family members who provided continuous care without structured respite opportunities experienced heightened stress, musculoskeletal pain, and psychological exhaustion (Smith & Jones, 2019). Such evidence underscores the paradox of caregiving: while family involvement is indispensable for patient adaptation, insufficient systemic support can undermine the well-being of the caregivers themselves. Therefore, health systems should integrate family education, counseling, and financial assistance as essential components of post-SCI rehabilitation.

The review revealed that adaptive family functioning—characterized by cohesion, flexibility, and open communication—correlates strongly with positive psychological and behavioral outcomes. Families that engaged in collaborative problem-solving and mutual role negotiation demonstrated higher resilience and greater satisfaction (Soendergaard et al., 2023). These findings are consistent with the principles of family systems theory, which emphasize interdependence among members and collective adjustment to stressors (Afsharipoor & Kalantari, 2025). Likewise, families capable of maintaining balanced emotional involvement and clear communication lines tended to experience lower rates of caregiver burden and interpersonal conflict (Rocha et al., 2021). This aligns with the work of (Green & Hall, 2021), who demonstrated that effective family communication predicted improved community reintegration and reduced emotional isolation among SCI survivors.

Conversely, dysfunctional communication and role rigidity hinder adaptation. When family members fail to share caregiving responsibilities equitably, resentment and guilt may emerge, thereby deteriorating relational harmony (Mohammadi & Ghasemi, 2021). The literature also indicates that gender and cultural expectations shape these dynamics, as women often assume disproportionate caregiving duties in traditional societies (Alizadeh & Moradi, 2018). Therefore, intervention frameworks must consider gender-sensitive approaches and encourage balanced role redistribution within families. Family cohesion and flexibility, as suggested by the Family Resilience Model, can mitigate these challenges and sustain emotional stability in both caregivers and patients (Mau et al., 2019).

Another key finding pertains to the relationship between family support, coping mechanisms, and self-efficacy. The presence of an encouraging family environment was associated with the use of adaptive coping strategies—such as problem-solving, positive reinterpretation, and social engagement—over maladaptive mechanisms like denial or withdrawal (Galvis Aparicio, Kunz, et al., 2021). This pattern mirrors findings from longitudinal studies showing that sustained family involvement enhances the internal locus of control and promotes psychological growth (Zahravand & Mohammadi, 2019). In particular, self-efficacy emerged as a mediating construct between family support and adaptation outcomes. Families that nurtured independence and self-responsibility contributed to stronger self-belief and greater motivation to participate in therapy (Abbasi & Shafiei, 2023). These results are congruent with those of (Mair & Moses, 2024), who found that family facilitation of autonomy improved intimacy and attachment security after SCI.

Interestingly, overprotective family behaviors were found to have the opposite effect. Excessive control and restriction—though often well-intentioned—can diminish patients' self-efficacy and hinder reintegration (Chaiyachet & Virasiri, 2021). Such findings reaffirm the importance of balancing protection with empowerment. Rehabilitation programs should, therefore, aim to educate families on fostering independence without neglecting emotional reassurance. Moreover, fostering adaptive coping within families—through shared stress management and emotional regulation—emerges as a key factor for long-term adjustment (Wilson et al., 2022).

The interplay between socioeconomic and cultural variables further elucidates the complexity of family adaptation. The review identified financial strain as one of the most consistent barriers to effective caregiving, particularly in resource-limited settings (Mohammadi & Ghasemi, 2021). Families with higher economic stability displayed greater access to assistive technologies and rehabilitation services, thereby achieving better functional outcomes. These disparities are magnified in lower-income regions, where state-sponsored rehabilitation remains insufficient (Yousefi & Hosseini, 2019). This reinforces the necessity for policy-level interventions to reduce inequality in post-SCI care and ensure that family-centered rehabilitation is accessible across social classes (Wangdell et al., 2025).

Cultural values also play a decisive role in shaping caregiving attitudes. In collectivist societies, strong familial obligation encourages long-term caregiving commitment, but it may simultaneously generate emotional fatigue and self-neglect among caregivers (Alizadeh & Moradi, 2018). Conversely, in more individualistic contexts, the reliance on institutional care may alleviate physical burden yet weaken family cohesion (Wilson et al., 2022). These cultural contrasts demonstrate that adaptation processes are context-dependent and should be interpreted through culturally sensitive frameworks. Rehabilitation specialists must adapt intervention models to align with local belief systems and social norms, ensuring that both the emotional and practical realities of caregiving are addressed (Sandalic et al., 2022).

When viewed through theoretical lenses, the findings converge with Roy's Adaptation Model and family resilience theory, both emphasizing that adaptation is a systemic process involving reciprocal adjustments among family members (Karimi & Heydari, 2017). The outcomes suggest that the family's ability to reorganize roles, maintain communication, and utilize external support determines the success of long-term adaptation. These dynamics resonate with the biopsychosocial model proposed by (Craig et al., 2018), which frames adaptation as the result of interlinked biological recovery, psychological adjustment, and social reintegration processes. Thus, family-centered rehabilitation does not merely supplement medical care—it forms an integral mechanism through which biopsychosocial adaptation unfolds.

Moreover, the present review's synthesis aligns with global trends emphasizing psychosocial rehabilitation. The integration of family interventions within rehabilitation programs has been shown to improve emotional well-being, physical functionality, and community participation (Soendergaard et al., 2023). Programs that equip families with coping tools, stress management skills, and communication training demonstrate superior outcomes compared to patient-only models (Dyck et al., 2019). This underscores a critical paradigm shift from individual-focused to family-inclusive rehabilitation, where caregivers are recognized as co-participants rather than peripheral supporters (McKay et al., 2019). The convergence of empirical and theoretical evidence supports the development of policies that institutionalize family education and psychological support as standard rehabilitation components worldwide.

5. Suggestions and Limitations

This study faced several limitations. First, as a scoping review, it synthesized a broad range of literature without assessing methodological quality, which may have introduced variability in the reliability of included findings. Second, the review was limited to English and Persian publications, potentially excluding relevant studies in other languages. Third, because most of the reviewed works were cross-sectional, causal inferences regarding family impact could not be firmly established. Fourth, the heterogeneity of study designs and contexts made quantitative comparison across studies difficult. Finally, the review relied primarily on published articles, which may have led to publication bias and an underrepresentation of gray literature, including dissertations and clinical reports.

Future research should focus on conducting longitudinal studies to understand how family roles evolve across different stages of recovery and over longer time horizons. Randomized controlled trials are needed to assess the efficacy of family-centered intervention models in improving adaptation outcomes. Comparative studies across cultural and socioeconomic settings would provide deeper insight into how contextual variables mediate family functioning and coping processes. Moreover, future work should examine the distinct needs of various family members—spouses, parents, and children—to design targeted educational and psychological interventions. Finally, incorporating mixed-method approaches could bridge quantitative outcomes with qualitative narratives, yielding a richer and more nuanced understanding of the family's adaptive journey.

In clinical and rehabilitation practice, programs should integrate families as core partners rather than passive supporters. Practitioners should provide structured education to caregivers on physical care, psychological resilience, and coping strategies. Rehabilitation centers must also offer counseling and peer-support groups to reduce caregiver burnout and enhance shared learning. Policies should be implemented to provide financial assistance, respite care, and community resources for families managing long-term SCI. Ultimately, healthcare systems should move toward holistic, family-centered rehabilitation frameworks that address the interconnected well-being of both patients and their caregivers.

Authors' Contributions

All authors have contributed significantly to the research process and the development of the manuscript.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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