Implementation of Spinal Cord Injury Peer Mentorship Programs in Rehabilitation Settings

Zhiyang Shi

Department of Kinesiology and Physical Education

Faculty of Education

McGill University, Montreal

February 2024

A thesis submitted to McGill University in partial fulfillment of the requirements of the degree of Doctor of Philosophy

Table of Contents

List of Tables

List of Figures

List of Abbreviations

- Spinal cord injury - SCI
- Quality of life - QoL

Abstract

After a spinal cord injury (SCI), an individual may experience various changes in their life (Alizadeh et al., 2019). To help individuals with SCI adapt and thrive, peer mentorship programs have been implemented in community and rehabilitation settings to build a purposeful and unidirectional relationship between a mentor and a mentee (Shaw et al., 2019). These programs can benefit individuals with SCI in many aspects, including adaptation, connection, personal growth, independence, knowledge, and participation (Rocchi et al., 2022). Despite the many positive outcomes of peer mentorship, these programs are only available to a small percentage of the SCI population (Shaw et al., 2019; Shi et al., 2020). Rehabilitation settings can be an ideal environment to implement peer mentorship programs because these programs can support individuals' reintegration into the community (Barclay & Hilton, 2022; Rocchi et al., 2022). However, few studies identified the key determinants (i.e., facilitators and barriers) and processes (i.e., actions/steps taken to achieve successful implementation) of implementing SCI peer mentorship programs in rehabilitation settings. Therefore, the overall purpose of this doctoral thesis was to identify key determinants, individual and organization processes of implementing SCI peer mentorship programs in rehabilitation settings. Chapter three adopted a qualitative multiple-case study design to identify and compare barriers, facilitators, and possible solutions to implementing a *prospective* peer mentorship program at a Chinese and a Canadian rehabilitation hospital. At the organizational level, a patient-centered team culture, collaborative work infrastructure, and connections with community SCI organizations were found to be the facilitators. At the individual level, engaging health professionals and patients with SCI, as well as establishing dynamic relationships between these individuals and SCI mentors were key processes for rehabilitation institutions to implement a peer mentorship program. Because SCI

mentors, mentees, and health professionals were found to be the three main players, Chapter four and five examined the relationship and collaboration among these individuals within an *ongoing* peer mentorship program delivered by a community-based organization at a rehabilitation center. Chapter four is a case study examining the collaboration between the health professionals and the SCI mentors. We found that the successful delivery of the program relied on the optimal program structure and the interprofessional collaboration between the health professionals and the SCI mentors. Chapter five examined the dyadic interactions and relationships between the SCI mentors and the mentees. Three creative non-fictional stories were developed to showcase the early mentorship introduction, the blurry friendship-mentorship boundary, and the impact of the blurry boundary on mentors' emotional well-being. Taken together, effective implementation of SCI peer mentorship programs in rehabilitation settings consists of 1) assessing the needs of the three main players (SCI mentors, mentees, health professionals) and leveraging available organizational resources, 2) creating flexibility in the program structure and drawing clear boundaries to build and maintain quality relationships among the three key players. This thesis contributed to the literature by identifying these key determinants, organization and individual processes and thus informed evidence-based approaches to implementing SCI peer mentorship programs in rehabilitation settings.

Résumé

Après une lésion médullaire (LM), une personne va devoir modifier son approche à certaines activités quotidiennes (Alizadeh et coll., 2019). Pour aider les personnes ayant une LM à s'adapter et prospérer, des programmes de mentorat par les pairs ont été mis en œuvre dans les milieux communautaires et en réadaptation, afin d'établir une relation ciblée et unidirectionnelle entre un mentor et un mentoré (Shaw et coll., 2019). Ces programmes peuvent être bénéfiques pour les personnes ayant une LM sous nombreux aspects, incluant le plan d'adaptation, la connexion, le développement personnel, l'indépendance, les connaissances, et la participation (Rocchi et coll., 2022). Malgré les résultats positifs du mentorat par les pairs, ces programmes ne sont disponibles qu'a un faible pourcentage de la population ayant une LM (Shaw et coll., 2019; Shi et coll., 2019). Les hôpitaux de réadaptation peuvent être un milieu idéal pour mettre en œuvre des programmes de mentorat par les pairs car ces programmes peuvent offrir l'opportunité aux individus de s'intégrer dans la communauté (Barclay & Hilton, 2022; Rocchi et coll., 2022). Cependant, peu d'études ont identifié les déterminants clés (c.-à-d. les facilitateurs et les obstacles) ainsi que les processus (c.-à-d. les mesures/étapes prises pour réussir la mise en œuvre) sur la mise en œuvre des programmes de mentorat entre pairs pour les personnes ayant une LM dans les milieux de réadaptation. Donc, l'objectif de cette thèse doctorale était d'identifier les déterminants et les processus individuels et organisationnels de la mise en œuvre des programmes de mentorat entre pairs pour personnes ayant une LM dans les milieux de réadaptation. Le chapitre trois a adopté une étude qualitative de cas multiples pour identifier et comparer les obstacles, les facilitateurs et les solutions possibles à la mise en œuvre d'un programme prospectif de mentorat par les pairs dans un hôpital de réadaptation chinois et un hôpital de réadaptation canadien. Au niveau organisationnel, une culture organisationnelle axée

sur le patient, une infrastructure de travail collaboratif et des liens avec des organisations communautaires en LM se sont révélés être des facilitateurs. Au niveau individuel, l'engagement des professionnels de la santé et des patients ayant une LM, ainsi que l'établissement de relations dynamiques entre ces parties et les mentors de personnes ayant une LM ont été des processus clés pour que les établissements de réadaptation mettent en œuvre un programme de mentorat par les pairs. Puisque les mentors, les mentorés et les professionnels de la santé en LM se sont avérés être les trois rôles principaux, les chapitres quatre et cinq ont examiné la relation et la collaboration entre ces personnes dans le cadre d'un programme de mentorat par les pairs offert par un organisme communautaire dans un hôpital de réadaptation. Le chapitre quatre est une étude de cas qui examine la collaboration entre les professionnels de la santé et les mentors vivant avec une LM. Le chapitre quatre a révélé que la réussite du programme dépendait de la structure optimale du programme et de la collaboration interprofessionnelle entre les professionnels de la santé et les mentors. Le chapitre cinq s'est concentré sur les interactions dyadiques et les relations entre les mentors et les mentorés ayant une LM. Trois histoires créatives et non fictives ont été élaborées pour illustrer les débuts du mentorat, la floue des limites entre l'amitié et le mentorat, et l'impact de ces limites floues sur le bien-être émotionnel des mentors. Dans l'ensemble, la mise en œuvre efficace des programmes de mentorat par les pairs dans les établissements de réadaptation consiste 1) planifier un programme en fonction des besoins et des ressources des établissements de réadaptation, et 2) établir des relations dynamiques entre les mentors, les mentorés et les professionnels de la santé en LM par le biais d'une communication constante et de limites claires. Cette thèse a contribué à la littérature en identifiant ces déterminants, ces processus organisationnels et individuels et a ainsi éclairé les

approches fondées sur des données probantes pour la mise en œuvre de programmes de mentorat par les pairs pour personnes ayant une LM dans les hôpitaux de réadaptation.

Acknowledgments

I am immensely grateful to the people who contributed significantly to the completion of this thesis:

- First and foremost, my heartfelt gratitude goes to my supervisor, Dr. Shane N. Sweet. Your guidance, care, and unwavering support have been invaluable to me during my time at McGill. I cherish every piece of memory we shared since I joined the lab as a Master's student. That includes all the meetings we had to talk about our research, all the traveling we went together around the world, all the life conversations we had outside of the university, and so on... You are an incredible supervisor, a role model, and a great friend to me. Thank you!
- Second, I offer my sincerest thanks to Dr. Aliki Thomas, Dr. Heather Gainforth, and Dr. Gordon Bloom for being my thesis committee members. Your meticulous review of my proposal and thoughtful feedback on my thesis are extremely important to me. Without your support and guidance, I would not complete my PhD program. It is my honor to work with and learn from you.
- Third, I also express my appreciation to my co-authors, Dr. Jeffrey Caron and Pierre Lepage. You shared so much knowledge with me and made tremendous efforts to my PhD research. The roles you have played as mentors and friends are the reason for my success.
- Fourth, I extend my heartfelt appreciation to Jacques Comeau. It's still heavy to think about the time we spent together at McGill. Thank you for everything you have done for me and the lab. You will be dearly missed.

- Fifth, I want to shout out to my TIE lab family! Keryn, Sam, Meredith, François, Natasha, Emilie, Jordan, Meaghan, Nour, Olivia, Tayah, Gabby, Natara, Lily, as well as Dr. Lindsay Duncan and her group. When I write your names down, I have a big smile on my face because of all the joyful memories we shared in the lab. :)
- Sixth, a special thanks to my hospital collaborators and KPE undergraduate students who have helped me with my PhD research. Your support has been instrumental in enabling this research to take place.
- Seventh, I must thank the participants of my PhD research. It was my pleasure to talk to you and hear about your experiences. You inspire me to keep advancing my research.
- Finally, I want to express my deepest gratitude to my family, especially my mother and father, for their unconditional love and support. There were ups and downs throughout my PhD journey but you have made everything worthy. I am so proud to have such amazing parents who are always by my side. I know we don't usually say this in our family, but now I want to tell you aloud: I love you.

Contributions to Original Knowledge

This doctoral thesis contributed to the literature by identifying the key determinants, organization and individual processes of implementing spinal cord injury (SCI) peer mentorship programs in rehabilitation settings. The determinants and processes include the barriers and facilitators to implement SCI peer mentorship programs, as well as potential solutions to address or leverage these barriers and facilitators. Some determinants and processes (e.g., mentorship-friendship boundary) were broadly discussed in past research but were further examined in this thesis. The other determinants and processes (e.g., health professionals' engagement) are novel to the literature and may inform evidence-based approaches to developing, implementing, and optimizing SCI peer mentorship programs in rehabilitation settings.

This thesis used the Consolidated Framework for Implementation Research (CFIR) to identify the determinants (barriers and facilitators) of implementing SCI peer mentorship programs. The findings of this thesis shed light on some of the under-researched aspects of the CFIR, including the interplay and the relative importance between the CFIR constructs. This thesis also demonstrated the applicability and usefulness of the CFIR in the SCI peer mentorship context.

Contributions of Authors

Chapter Three: Interprofessional efforts to implement peer mentorship programs for people with spinal cord injury in rehabilitation settings

Co-author: Zhiyang Shi

- Contributions: Z. Shi is the first author with roles in study conceptualization, design, ethics, participant recruitment, data collection, data analysis, manuscript writing and submission.

Co-author: Heather L. Gainforth

- Contributions: Dr. Gainforth is a member of the candidate's supervisory committee. She contributed to the conceptualization and design of the research and provided feedback on the manuscript writing and revisions.

Co-author: Aliki Thomas

- Contributions: Dr. Thomas is a member of the candidate's supervisory committee. She contributed to the conceptualization and design of the research and provided feedback on the manuscript writing and revisions.

Co-author: Gordon A. Bloom

- Contributions: Dr. Bloom is a member of the candidate's supervisory committee. He contributed to the conceptualization and design of the research and provided feedback on the manuscript writing and revisions.

Co-author: Shane N. Sweet

- Contributions: Dr. Sweet is the candidate's supervisor. He contributed to the conceptualization and design of the research, ethics, and data collection. He also

contributed to the data analysis as a critical friend and participated in the manuscript writing, revision, and submission.

Status of Manuscript: Submitted

Chapter Four: Delivery of a community-based peer mentorship program for people with spinal cord injury at a rehabilitation center

Co-author: Zhiyang Shi

- Contributions: Z. Shi is the first author with roles in study conceptualization, design, ethics, participant recruitment, data collection, data analysis, manuscript writing and submission.

Co-author: Jacques Comeau

- Contributions: J. Comeau contributed to the interpretation and analysis of the qualitative data, provided feedback on the manuscript writing and revisions.

Co-author: Gordon A. Bloom

- Contributions: Dr. Bloom is a member of the candidate's supervisory committee. He contributed to the conceptualization and design of the research, data analysis, and provided feedback on the manuscript writing and revisions.

Co-author: Heather L. Gainforth

- Contributions: Dr. Gainforth is a member of the candidate's supervisory committee. She contributed to the conceptualization and design of the research and provided feedback on the manuscript writing and revisions.

Co-author: Aliki Thomas

- Contributions: Dr. Thomas is a member of the candidate's supervisory committee. She contributed to the conceptualization and design of the research and provided feedback on the manuscript writing and revisions.

Co-author: Shane N. Sweet

- Contributions: Dr. Sweet is the candidate's supervisor. He contributed to the conceptualization and design of the research, ethics, and data collection. He also contributed to the data analysis as a critical friend and participated in the manuscript writing, revision, and submission.

Status of Manuscript: Published

Chapter Five: Creative-non-fiction approach to explore peer mentorship for individuals with spinal cord injury

Co-author: Zhiyang Shi

- Contributions: Z. Shi is the first author with roles in conceptualizing the methodology and leading the creative non-fictional analysis, manuscript writing and submission.

Co-author: Jeffrey G. Caron

- Contributions: Dr. Caron contributed to the conceptualization and design of the research. He collected the interview data and participated in the data analysis, manuscript writing and revision.

Co-author: Jacques Comeau

- Contributions: J. Comeau contributed to the data analysis with his lived experience as a SCI peer mentor. He also contributed to the manuscript writing and revision.

Co-author: Pierre Lepage

- Contributions: P. Lepage contributed to the methodology design, and contributed to the data analysis. He also provided feedback on the manuscript writing.

Co-author: Shane N. Sweet

- Contributions: Dr. Sweet is the candidate's supervisor. He contributed to the conceptualization and design of the research. He also contributed to the data analysis, manuscript writing, revision, and submission.

Status of Manuscript: Published

Preface

This doctoral thesis is written and organized in the manuscript based style according to the university requirement. Six chapters are included in this thesis. Chapter one offers a general introduction to the research topic and a summary of the research questions. Chapter two is a comprehensive review of the relevant literature. Chapter three is an original manuscript to be submitted to a peer-reviewed journal. Chapter four is an original manuscript published in *Frontiers in Rehabilitation Sciences* (Shi et al., 2023). Chapter five is an original manuscript published by *Rehabilitation Psychology* (Shi et al., 2024). Chapter six provides an overall summary of the findings, discusses the theoretical and practical implications of the findings, and highlights the future research directions.

The COVID-19 pandemic disrupted the original intent of the trajectory of this thesis which was to co-create a peer mentorship program with rehabilitation hospitals. Given the impact of the pandemic on the healthcare systems in China and in Canada, rehabilitation hospitals prioritized managing the pandemic, limiting their ability to collaborate on developing a peer mentorship program. Therefore, the overall objective of this doctoral research was changed to identify key determinants and processes of implementing SCI peer mentorship programs in rehabilitation settings. The studies in this thesis are sequenced based on the implementation process rather than by chronological order. Chapter three is presented first to focus on the pre-implementation phase, and Chapter four and five for the implementation phase. Chapters three and four were conducted and analyzed concurrently and presented first as they outlined organizational processes. Chapter 5 was conducted and analyzed first, but presented last because it highlights the individual processes. The only Artificial Intelligence tool used in this thesis was the Microsoft Teams transcribing function.

Chapter One: General Introduction

A spinal cord injury (SCI) is any damage/lesion to the spinal cord that leads to temporary or permanent changes in an individual's autonomic, motor, and sensory functions (Alizadeh et al., 2019). Following a SCI, an individual's life can be significantly altered in multiple dimensions, including decreased health conditions, social participation, and overall well-being (Alizadeh et al., 2019; Feigin et al., 2019). Peer mentorship has been used to help individuals with SCI adapt and thrive. *Peers* are individuals who face similar significant life challenges (Sherman et al., 2004). *Peer mentorship* is a purposeful and unidirectional relationship, where a *mentor* (i.e., individuals who have lived experience and provide the support) is to function as a support for a *mentee* (i.e., individuals who seek support from someone with lived experience; Balcazar et al., 2011).

Peer mentorship programs have been implemented and delivered in community and rehabilitation settings (Shaw et al., 2019). These programs are often multi-purposed (e.g., focusing on rehabilitation and/or community reintegration), and adopt different delivery approaches, such as group activities and/or one-on-one discussion (Shaw et al., 2019). These programs can benefit individuals with SCI in many aspects, including adaptation, connection, personal growth, independence, knowledge, and participation (Rocchi et al., 2022). Despite the numerous positive outcomes of peer mentorship, these programs are only available for a small percentage of the SCI population. In Canada, 1.6% of the SCI population participate in peer mentorship programs (Shaw et al., 2019). A Chinese study found no indication of existing SCI peer mentorship programs in rehabilitation settings in the country (Shi et al., 2020). There is an evident need for implementing more peer mentorship programs for individuals with SCI.

Previous literature has been placing greater emphasis on understanding the outcomes of SCI peer mentorship (Alexander et al., 2022; Barclay & Hilton, 2019; Beauchamp et al., 2016; Chemtob et al., 2018; Sweet et al., 2018; Sweet et al., 2021b; Veith et al., 2006). These studies highlighted the value of peer mentorship but offered little insights on *how* peer mentorship programs could be structured and implemented in real-life settings to result in positive outcomes. Furthermore, a number of the studies looked at peer mentorship programs in community-based settings, while few have focused on the programs in rehabilitation settings.

Rehabilitation settings (e.g., hospitals, rehabilitation centers) can be an ideal environment to implement peer mentorship programs because many outcomes of peer mentorship align with the primary goal of SCI rehabilitation, that is to support individuals' reintegration into the community (Barclay & Hilton, 2022; Rocchi et al., 2022; Sweet et al., 2021a). Depending on local healthcare system and individual differences in SCI conditions, the length of an individual's rehabilitation process can range from a few weeks to several months (Cheng et al., 2017; Shi et al., 2020). This period can be an early, effective time to establish peer mentorship relationships (Sweet et al., 2021a). Integration of peer mentorship into rehabilitation services can provide people with SCI with unique perspectives based on peers' lived experience, which are not necessarily offered by health professionals (Haas et al., 2013).

A couple of recent studies investigated the implementation of SCI peer mentorship programs in rehabilitation settings and described some collaboration processes between the mentors and the health professionals (Cabigon et al. 2019; Hoffmann et al., 2019). However, the primary objective of both studies was to examine the feasibility of their specific programs rather than identifying key determinants (i.e., facilitators and barriers) and processes (i.e., actions/steps taken to achieve successful implementation) of the implementation of the programs.

Past research highlighted that identifying barriers and facilitators within the local context is an essential step for successful implementation (Graham et al., 2006). Recognizing implementation barriers and facilitators upfront allows for proactive planning in the pre-implementation stage, while it can also inform optimization of a program in the implementation stage (Ellen et al., 2014). Moreover, capturing the individual and organizational processes of how the barriers and facilitators can be addressed/leveraged will provide insights on *how* to effectively implement SCI peer mentorship programs in various rehabilitation settings.

Overall Purpose and Objectives

The overall purpose of this PhD thesis is to identify key determinants, individual and organization processes of implementing SCI peer mentorship programs in rehabilitation settings. To achieve the overall purpose, this thesis addresses three specific research objectives:

1. The first objective to identify and compare barriers, facilitators, and possible solutions to implementing a *prospective* SCI peer mentorship program at two rehabilitation hospitals from the perspective of rehabilitation health professionals. The research question included: 1) what were the common and distinct barriers and facilitators to implementing a prospective peer mentorship program in the two rehabilitation hospitals? 2) what possible solutions to addressing/leveraging the barriers and facilitators did health professionals identify prior to the implementation of the program?
2. The second objective is to identify barriers, facilitators, and collaboration processes within an *existing* SCI peer mentorship program provided by a community-based organization at a rehabilitation center. The research questions were: 1) how was the peer mentorship program delivered through the collaborations between the community-based organization and the rehabilitation center? 2) what were the barriers and facilitators to the

delivery of the program? and 3) what were the interprofessional relationships between the community organizational staff (e.g., SCI peer mentors) and the rehabilitation health professionals?

3. The third objective is to explore the dyadic interactions and relationships between SCI peer mentors and mentees within an *existing* peer mentorship program provided by a community-based organization at a rehabilitation center. The research questions were: 1) how was the relationship between SCI mentors and mentees formed? 2) how were mentor-mentee interactions carried out in a real-life peer mentorship program? 3) how did the SCI peer mentorship relationship evolve over time?

Chapter Two: Literature Review

Spinal Cord Injury

A spinal cord injury (SCI) refers to any damage/lesion to the spinal cord that leads to temporary or permanent changes in an individual's autonomic, motor, and sensory functions (Alizadeh et al., 2019; Maynard et al., 1997). Being one of the leading causes of life-long disabilities, an SCI is a life-changing neurological condition with tremendous personal and socioeconomic implications for an individual, their loved ones and care providers (Alizadeh et al., 2019; Feigin et al., 2019). Depending on the severity and the level of injury, an SCI can be classified as complete/incomplete tetraplegia and paraplegia. Tetraplegia is paralysis resulted from cervical injuries which lead to a complete or incomplete loss of functions in the all four limbs and trunk. Paraplegia is paralysis resulted from thoracic, lumbar or sacral injuries which lead to a complete or incomplete loss of functions in the lower extremities (Maynard et al., 1997).

The American Spinal Injury Association Impairment Scale (AIS) is widely used to determine if an SCI is complete or incomplete, which consists of five degrees (A – complete; B to E – incomplete; Roberts et al., 2017). The use of AIS in defining the severity and the prognosis of an SCI requires taking into consideration the level of the injury. For example, someone with a Grade A complete injury in the lower lumbar spine (e.g., L4/L5) can experience bowel and bladder dysfunctions with foot-drop, while remaining ambulatory. By contrast, someone with a Grade C/D incomplete injury in the cervical spine (e.g., C3/4) may be tetraplegic and lose their ability to walk (Roberts et al., 2017).

Based on the cause of injury, an SCI can also be classified as traumatic and non-traumatic. Traumatic SCI is an acute, traumatic lesion in the spine, which is commonly caused

by falls (with a prevalence of 51% in Canada; 20%-40% in China), motor vehicle accidents (26% in Canada; 50% in China), sport activities (15% in Canada; below 5% in China), and violence (below 4% in Canada and China; Hao et al., 2021; Praxis Spinal Cord Institute, 2021; Yuan et al., 2018). Non-traumatic SCI is any damage to the spinal cord which is not caused by a major trauma, such as spinal tumors (with a prevalence of 26.6%), Pott's spine (25%), and transverse myelitis (22%; Gupta et al., 2009). The etiological statistics for non-traumatic SCI were similar in China (Khadour et al., 2024). A traumatic SCI can differ from a non-traumatic SCI in terms of patient outcomes and complications. For example, urinary tract infections were more prevalent among people with traumatic SCI, while pressure ulcers were more frequent among those with non-traumatic SCI (Gedde et al., 2019).

In Canada, there are approximately 86,000 people living with SCI and an estimated incidence of over 4,000 new cases per year (Noonan et al., 2012). About 70% of Canadians with SCI have a traumatic SCI, and 30% have a non-traumatic SCI. The majority of Canadians with SCI reside in large urban areas, and only about 20% reside in small communities. Another noticeable demographical characteristic of SCI is that approximately 78% of Canadians with SCI are men, which is likely due to the higher rate of traumatic SCI in men than in women (Praxis Spinal Cord Institute, 2021). The increasing global incidence, prevalence, and years lived with disability of SCI have contributed to an increasing demand for treatment, rehabilitation, and services for individuals with SCI in Canada and across the world (Ding et al., 2022; Feigin et al., 2019).

Rehabilitation of SCI

Despite recent advances in neurological research and acute treatment, SCI remains an incurable condition. Individuals with SCI rely on rehabilitative strategies to improve their health

(Silva et al., 2014). Depending on the local healthcare system, the rehabilitation process of SCI varies across different countries and regions. In Canada, after the occurrence of an SCI, most people tend to first undergo acute care (e.g., surgeries) at hospitals, and then transit to rehabilitation units or rehabilitation-specialized settings (e.g., rehabilitation centers; Lenehan et al., 2012). On average, Canadians with SCI spend 26 days undergoing acute care and 79 days in rehabilitation (Cheng et al., 2017). In China, individuals with SCI often spend about 40 days in the acute phase and 190 (for traumatic SCI) or 50 days (for non-traumatic SCI) in rehabilitation (Khadour et al., 2024). The main focus of in-patient acute care and rehabilitation is "developing functional independence through education, teaching, health care, and services for people who sustain SCI" (Noreau et al., 2014, p.249). The primary goal of inpatient rehabilitation should be "to prepare people to reintegrate into their community" (Barclay & Hilton, 2022, p.501).

Rehabilitation of SCI requires input from a range of health professionals, such as physiotherapists, occupational therapists, nurses, psychologists, social workers and physicians (Momsen et al., 2012). In Pellatt's (2007) qualitative study, inpatients with SCI deemed physiotherapists as "the key to rehabilitation" because inpatients had the most extensive interactions with their physiotherapists during in-patient stay. Occupational therapists' role was being involved in enhancing inpatients' hand function and activities of daily living, whereas doctors' role was the team coordinator and supervisor. All these members need to work as an interdisciplinary team to deliver accessible and quality rehabilitation service for people with SCI (Dzurenko, 2005).

Implications of SCI

An SCI can lead to various implications on an individual's life. People with SCI often experience impairments of physical functions. One significant physical implication of SCI is the

loss of ambulation (Van Der Meer et al., 2017). The majority of people with SCI require the use of mobility/seating devices, such as manual or power wheelchairs, to restore mobility (Selph et al., 2021). Consequently, wheelchair users' physical functions and capacity may further reduce due to inactive lifestyles (Martin Ginis et al., 2017; Smith et al., 2016). Furthermore, reliance on wheelchair use is associated with an increasing possibility of falls and secondary injuries (Butler Forslund et al., 2017).

People may also experience a variety of secondary conditions after an SCI, such as pressure ulcers, neuropathic pain, bowel and bladder dysfunction, sexual dysfunction, autonomic dysreflexia, and spasticity (Lenehan et al., 2012). These secondary conditions can result in (re)hospitalization and decreased perceived health status of people with SCI (Noonan et al., 2014). Cardiovascular, pulmonary, and infectious complications are leading causes of death after an SCI (Sweis & Biller, 2017). If these conditions are not managed efficiently, they can cause a negative impact on individuals' social participation and quality of life (Noonan et al., 2014; Simpson et al., 2012). Timely self-care education is one strategy for people to prevent and cope with secondary conditions following an SCI (Conti et al., 2022).

In addition to physical complications, mental health problems are prevalent among people with SCI. The SCI population has a high risk of depression which was estimated to range from 20% to 40% within the first eight months post-injury (Craig et al., 2009). Other mental health issues, such as anxiety, intrusive thoughts, and avoidance of traumatic stimuli are also prevalent among people with SCI (Hagen, 2015; Lim et al., 2017). Chung et al. (2006) found that people with SCI tend to endorse a more external than an internal locus of control, suggesting that these individuals believe their lives are largely influenced by external factors beyond their

control. People with SCI who have an external locus of control are more likely to have poor mental well-being, including a sense of helplessness and intrusion (Elfström & Kreuter, 2006).

The COVID-19 pandemic caused drastic disruptions on people's lives. Individuals with SCI experience unique and additional impacts of the pandemic as they encountered increasing barriers to seeking health care, personal assistance, employment, community services, and social support (Adams et al., 2021; Mesa et al., 2022; Taylor et al., 2023). Consequently, the physical and mental complications of SCI were found to exacerbate during the pandemic (Khadour et al., 2023). A survey including 71 participants with SCI (constituting 24% of the sample) found that 50% of participants experienced a decline in perceived health status, with increased pain being the main reason (Bentzen et al., 2021). A Canadian survey found that over 30% of participants with SCI reported probable depression, while 50% experienced at least mild depressive symptoms. These rates were higher than the ones reported prior to the pandemic. In addition, 20% of participants reported suicidal ideation (Taylor et al., 2023). These physical and mental health problems are associated with reduced participation and quality of life among people with SCI (Khadour et al., 2023; Robinson-Whelen et al., 2023).

Participation and Quality of Life post-SCI

According to the International Classification of Functioning, Disability and Health, participation refers to one's involvement in a life situation (WHO, 2001). A Canadian national survey of 1549 persons with SCI reported that only 60% of adults with SCI were satisfied with their participation in the investigated 26 daily and social activities (e.g., productive activities/work). About 30% of participants reported having no desire to participate in activities in relation to community organizations or work (Noreau et al., 2014). Noreau et al. (2002) suggested that social support from others is an important contributor to participation after an

SCI, also leading to an increase in one's quality of life (Barker et al., 2009). Due to the special situations during the pandemic (e.g., lockdown, social distancing), individuals with SCI experienced a decrease in social participation (Fortin-Bédard et al., 2022). A study of 346 people with SCI in the U.S. indicated that about 50% of participants reported a worsening of loneliness, and a reduction in face-to-face interactions and participation in life roles (Robinson-Whelen et al., 2023).

A growing body of literature places emphasis on enhancing the quality of life (QoL) of the SCI population (Bentzen et al., 2021). People with SCI tend to have lower QoL than the general population (Lude et al., 2014). Studies, conducted during the pandemic, also found a decrease in QoL among people with SCI (García-Rudolph et al., 2022; Matsuoka & Sumida, 2022). Interestingly, García-Rudolph et al. (2022) only found a significant decrease in QoL among participants under 54 years old, whereas no significant change was found among those older than 55 years old. This finding suggests that QoL may be highly associated with individual differences in life situations and personal needs.

To increase participation and QoL of people with SCI, there is a need to understand their individual needs. People with SCI expressed their needs in several aspects, including the need for peer support (Noreau et al., 2014). According to the national survey in Canada, 32% of individuals with traumatic SCI and 26% with non-traumatic SCI expressed the need for peer support. However, only 56% of individuals with traumatic SCI and 42% of those with non-traumatic SCI reported that their need for peer support was met (Noreau et al., 2014). Importantly, research has shown that the unmet need for peer support is related to individuals' low QoL and thus we should understand the roles of peers and how to meet the need for peer support of people with SCI (Sweet et al., 2016).

Peer Support for People with SCI

Social support has been recognized as an important resource for people to cope with SCI. Greater social support was shown to be associated with higher QoL of people with SCI (Charlifue, 2009). In the healthcare/rehabilitation context, social support can be provided by care providers, family, friends, and work colleagues (Chronister et al., 2006). In addition, *peers* have been reported as a valuable source of social support (Faulkner et al., 2009; Gassaway et al., 2017). *Peers* are individuals who share the same significant living situation, such as living with SCI (Sherman et al., 2004; Veith, 2006). *Peer support* is an umbrella term to describe a wide range of support (e.g., informational, instrumental, emotional, appraisal) provided by people with SCI to people with SCI. Peer support is based on the recognition that experiential knowledge and shared experiences can be extremely valuable to the SCI population (Magasi & Papadimitriou, 2022).

A relationship with peers differs from other relationships such as with family members, because it has unique characteristics. In the SCI context, peers were perceived as highly credible, equitable, and accepting, had a mutuality of experiences, and were capable of normalizing experiences (Veith et al., 2006). In addition, discussion topics, type of instrumental support, and the depth of the relationship between peers were different from other relationships (Veith et al., 2006). Through such a relationship, peer support can be delivered through *mutual peer support* and *peer mentorship*. Mutual peer support consists of mutual interactions benefiting all individuals involved, whereas *peer mentorship* refers to a purposeful and unidirectional relationship, where a mentor is to function as a supporter for a mentee (Hayes & Balcazar, 2008; Balcazar et al., 2011).

Impact of SCI Peer Support

Past research has placed great emphasis on understanding the impact of peer support, particularly peer mentorship, on individuals with SCI. A recent meta-synthesis study summarized the outcomes of peer mentorship reported in research studies and grey literature, such as annual reports of community SCI organizations (Rocchi et al., 2022). They found 87 outcomes and grouped them into six domains: independence, personal growth, participation, adaptation, knowledge, and connection. This study demonstrated the complex, profound influence of peer mentorship on different life aspects of individuals with SCI. To enhance the lives of individuals with SCI, a variety of peer support (particularly peer mentorship) interventions and programs were developed and examined in both community and rehabilitation settings (Barclay & Hilton, 2019).

Experimental Peer Support Interventions

Many peer support interventions in the literature were unique because they were developed by researchers with a primary objective of testing the intervention effectiveness with experimental designs. The majority of these experimental peer interventions target at specific outcomes in accordance to the needs of the local context. For example, Latimer-Cheung et al. (2013) developed a peer-led strength training intervention for those who have returned home after SCI. In the intervention, a fitness trainer and a peer with paraplegia visited participants' home to facilitate the strength-training activities. This intervention was grounded in Bandura's (1977) Self-efficacy Theory and targeted at improving self-efficacy through verbal persuasion, physiological feedback, mastery and vicarious experience (i.e., four sources of self-efficacy). The intervention received participants' positive feedbacks, and led to medium- to large-sized increases in self-efficacy, intentions, action planning, and strength-training behaviours. Latimer-

Cheung et al.'s (2013) study showed how the peer support intervention could lead to the intended health behaviour change through the improvement of the psychological outcomes.

With a greater emphasis on the promotion of daily and social participation of individuals with SCI, "My Care My Call" is another peer-led empowerment intervention delivered via phone calls (Houlihan et al., 2017). Eighty-four participants were randomized to an intervention group of having regular calls with a peer supporter or a control group of usual care. The intervention group reported a greater increase in their ability and willingness to participate in self-management activities and a greater decrease in social activities limitations compared the control group. In addition, the intervention group had greater life satisfaction, better awareness and use of services than the control.

Overall, a main focus of experimental peer support interventions is on self-management of individuals with SCI. A scoping review of self-management interventions (N = 102) following SCI showed that peers were the most common individuals delivering the intervention materials (McIntyre et al., 2020). Recent studies also combined peer support with digital technologies to deliver self-management interventions for people with SCI, such as the PHOENIX (Peer-supported Health Outreach, Education, and Information Exchange) program, which integrated online training content and peer supporters through telehealth (Newman et al., 2023). Some of these experimental interventions demonstrated good feasibility and effectiveness, which could be applied and maintained in real-life, community-based settings.

Community-based Peer Support Programs

In addition to experimental interventions, peer support has been developed and delivered by community-based SCI organizations as a part of their services. These programs are often multi-purposed (e.g., focusing on rehabilitation and/or community reintegration), and use

different delivery approaches (e.g., group, one-on-one; Shaw et al., 2019). Peers can play different roles in these programs, including peer mentor, mutual peer supporter, peer counsellor, peer facilitator, peer educator, and peer case manager (Barclay & Hilton, 2019). Among these roles, peer mentor is utilized more often by community-based SCI organizations and receives the most research attention.

Sweet et al. (2021a) summarized four key mechanics of community-based SCI peer mentorship programs. First, *content of mentorship discussion* may have a direct influence on the mentorship outcomes. Mentor-mentee conversations can cover a variety of topics, such as personal information, recreation, and rehabilitation (McKay et al., 2022). In addition, mentors and mentees often adopt multiple conversation techniques, such as asking open-ended questions, providing advice with permission, and sharing personal perspective. Some of these techniques were found to facilitate the mentor-mentee rapport (McKay et al., 2022). Second, *characteristics of mentors* can make a difference on the mentorship relationship. A study found that high-quality mentor characteristics might contribute to positive mentorship experiences, such as being trustworthy, responsible, honest, and nonjudgmental. Low-quality mentor characteristics included being close-minded, uncompassionate, and uncomfortable with emotions (Gainforth et al., 2019). The third mentorship mechanic is *characteristics of mentees*. Specifically, mentees who have strong motivation to participating in peer mentorship programs and take control in how they engage with mentors are more likely to benefit from the relationship (Sweet et al., 2018; Sweet et al., 2021a). The last mechanic is around *mentor-mentee relationship*s. Sharing common ground and clear objectives between mentors and mentees was found to facilitate their relationship. In addition, a "mentee-focused" relationship in which the mentor is responsive and caring to the mentees' needs is more likely to produce positive mentorship experiences (Sweet et

al., 2021a). Establishing a mentee-focused relationship requires mentors to demonstrate transformational leadership skills and ability to take individualized considerations (Martin Ginis et al., 2018; Shaw et al., 2018).

Taken together, experimental peer support interventions and community-based programs can have a complex impact on individuals with SCI depending on how they are structured and delivered (Barclay & Hilton, 2019). Exploring different contexts in which these interventions and programs are implemented may help us develop a further understanding of the impact of peer mentorship.

Peer Support in Rehabilitation

As mentioned above, individuals with SCI often spend a period of time (several weeks or months) undergoing inpatient rehabilitation in specialized settings, such as rehabilitation hospitals and rehabilitation centers (Dwyer & Mulligan, 2015). After inpatient rehabilitation, these individuals will be discharged to live in their home or alternate accommodations, while some may continue receiving out-patient rehabilitation services (Barclay & Hilton, 2022). This transition process from rehabilitation to home can be facilitated by peer support because many outcomes of peer support align with the primary goal of rehabilitation, that is to "prepare people to reintegrate into their community" (Barclay & Hilton, 2022, p.501).

Inpatient Peer Support Interventions

To test the application of peer support in rehabilitation, researchers designed interventions that aimed to address various needs of individuals with SCI in inpatient rehabilitation settings. For example, Gassaway et al. (2019) developed a 15-week in-patient peer support intervention in a rehabilitation hospital and assessed its effect. The intervention involved a peer leader who had 15 years of experience living with SCI sharing knowledge of self-care and

problem-solving with a class of multiple adults with SCI. The results showed that participants' engagement in self-care learning increased following the intervention. Gassaway et al. (2017) also examined the effect of a one-on-one peer support intervention in a rehabilitation hospital specializing in SCI. Participants enrolled in the intervention received in-person peer mentorship by meeting with a SCI mentor weekly during the inpatient stay and for 90 days after discharge. These participants reported a greater increase in general self-efficacy and lower rates of hospital readmission post-discharge than the control group. The peer mentors played an important educator role in the intervention and were able to promote participants' engagement in self-care learning. Recently, this intervention was examined with a larger sample size and was found to reduce unplanned hospital readmissions and hospitalization days of the participants (Jones et al., 2021).

Another effective model of integrating peer support into inpatient rehabilitation settings is the Disabling Bullet program in the U.S. (Hernandez, 2005). This program pairs new patients who acquired violence-related SCI with a peer mentor who has at least two years of experience living with SCI. Hernandez (2005) explored the experience of mentees in this program and found that the mentees could benefit from the program by learning about community resources and obtaining a greater sense of relatedness and connectedness. One unique attribute of this program is that it targeted at relatively younger individuals who acquired traumatic SCI and was able to assist these individuals develop a new identity living with a disability prior to hospital discharge.

With a similar objective of facilitating the rehabilitation of individuals with violently acquired SCI, another peer support intervention was delivered in an urban rehabilitation hospital in the U.S. (Balcazar et al., 2011). The mentors and mentees discussed a variety of issues related to rehabilitation and health, such as prevention of secondary complications and referrals to

physical, occupational, and psychological therapy. The mentees who completed the intervention reported high scores in social integration, which indicated a positive perception of their social network and the support received from the mentors. One interesting result was that the local health professionals provided positive feedback on the peer support intervention. The health professionals mentioned that the intervention was able to benefit both mentors and mentees by creating education opportunities and enhancing social support in the hospital.

Similarly, Veith et al. (2006) found that the peer mentors can provide the mentees with practical, emotional, and identity-changing benefits at the local hospital. In a peer support program in the U.K., the researchers found that the local healthcare providers appreciated the unique perspective provided by the peer supporters within a SCI peer support program (Haas et al., 2013). To summarize, peer support programs can be integrated into in-patient rehabilitation settings and produce multiple positive outcomes for inpatients with SCI.

Outpatient Peer Support Interventions

Another way to facilitate the rehabilitation process for individuals with SCI is by delivering peer support in outpatient settings. For instance, a self-management intervention was designed and provided to individuals with SCI as a part of an outpatient vocational rehabilitation service in Singapore (Koh & Mortenson, 2023). The intervention was mostly delivered by a group of health professionals, including two physiotherapists and one occupational therapist, while it incorporated in-person peer conversations and videos of peers offering advice and demonstrating skills. The researchers found that the program was well-received by the participants and led to an increase in their self-efficacy (Koh & Mortenson, 2023).

A line of research has been conducted on *Active Rehabilitation* for the SCI population, which is a concept of facilitating the community reintegration post-discharge through peer

mentorship (Divanoglou et al., 2017, 2019; Divanoglou & Georgiou, 2017; Dybwad & Wedege, 2022). The delivery of Active Rehabilitation is mainly through training camps organized by peer mentors with SCI and assistants without disabilities (e.g., medical doctor, physiotherapist, nurse). The camps often consist of wheelchair skills training, activities of daily living, sports and recreational activities, and education on SCI. Multiple benefits of Active Rehabilitation are reported, such as promoting physical independence and wheelchair mobility. These Active Rehabilitation training camps have been implemented in more than 20 countries in the world. Similar to the intervention in Singapore (Koh & Mortenson, 2023), the Active Rehabilitation is mostly delivered in the community. Both of them are different from the aforementioned community-based programs because of their specific focus on the post-discharge period and the involvement of rehabilitation health professionals. Another unique feature of the Active Rehabilitation is that the program is delivered through a residential, activity-based approach.

Taken together, these studies demonstrated different approaches of integrating SCI peer support into rehabilitation process (inpatient and outpatient). However, the descriptions of these interventions and programs focused on reporting the outcomes. Few details on the implementation process (i.e., how these interventions and programs were implemented within the rehabilitation settings) are available. Reporting and analyzing the implementation process can lead to a better understanding of how positive outcomes of SCI peer support programs could be produced and maximized.

Peer Support Programs Implementation in Rehabilitation

Recent studies have provided some details as per the implementation processes of SCI peer mentorship programs in rehabilitation settings. For example, Hoffmann et al. (2019) implemented a peer mentorship program as a supplement to in-patient rehabilitation for patients

with SCI in Denmark. The mentors were recruited from previously established peer-activities at the rehabilitation centers or through advertisement on social media. All the mentors received training led by the health professionals of the rehabilitation centers and worked as volunteers within the program. Four designated program personnel were employed part-time, including two health professionals who worked 5 hours/week and two persons with SCI who worked 11 hours/week as the mentor coordinator. They were tasked with introducing the program to patients, matching mentors and mentees, coordinating mentor-mentee meetings, tracking the program by distributing questionnaires, and addressing other logistics for the program. Within the program, peer mentorship was delivered through one-on-one meetings between mentor and mentee. Despite providing information on the development process of the program and describing roles of health professionals, Hoffmann et al. (2019) did not report on the factors that facilitated or hindered the development and implementation of the program. Even though Hoffmann et al. (2019) found that the local health professionals played important roles within the program, they did not offer insights on how the health professionals and the peer mentors build and maintain consistent collaboration within the program. A lack of understanding on facilitators and barriers of the program implementation and collaboration processes between health professionals and peer mentors can limit our ability to implement SCI peer mentorship programs in rehabilitation settings.

Hoffmann et al. (2019) focused on the Danish context where the rehabilitation system may differ from other countries. Compared to countries such as China and Canada, Denmark has a smaller general population and a lower incidence of SCI (130 new cases/year). All primary rehabilitation for SCI in Denmark is concentrated at two specialized centers that offer both in- and out-patient services (Hoffmann et al., 2019). This unique system made a nationwide peer

mentorship program feasible in Denmark. In contrast, the rehabilitation system in countries with a larger geography and SCI population may require a peer mentorship program to be adapted to the specific local context. As such, there is a need to understand the local context by identifying potential barriers and facilitators prior to the implementation of a SCI peer mentorship program.

Shaw et al. (2019) and Sweet et al. (2021a) took an overall, nationwide look at the implementation of peer mentorship programs in Canada. Specifically, Shaw et al. (2019) used the RE-AIM framework to investigate the peer mentorship programs in Canada from five dimensions: reach, effectiveness, adoption, implementation, and maintenance. They found that provincial community organizations reached about 1.6% of the Canadian SCI population. All nine recruited provincial organizations deliver peer mentorship programs in both hospitals and community settings. These programs occur at more than 41 hospitals, including rehabilitation and general hospitals. Over 1.9 million Canadian dollars were allocated to the operation of these programs across the nine organizations during the 2016/17 fiscal year. Most organizations maintained the delivery of their programs for more than a decade and above half of the organizations tracked the outcomes of their programs.

This national-level information was supplemented by Sweet et al. (2021a) who investigated the delivery of the SCI peer mentorship programs at an organization level. They found that the community-based organizations had different ways to introduce peer mentorship to their members with SCI (e.g., through sports events), and the mentorship could be delivered through formal and/or informal interactions between mentors and mentees. In addition, the organizations were responsible to build and maintain collaborations with other organizations and health sectors in order to sustain and enlarge their programs. One limitation of this study was that

the researchers did not differentiate the provincial organizations or the various types of programs provided by these organizations.

In sum, Shaw et al. (2019) and Sweet et al. (2021a) highlighted different approaches used by community-based organizations to design, deliver, and maintain peer mentorship programs. A standard or optimal modality to deliver peer mentorship programs might not be effective because community-based organizations often have different needs and deliver the programs in various settings.

Evidence-practice Gaps

Despite the research evidence showing the benefits of SCI peer mentorship, these programs have been implemented within a limited number of rehabilitation settings. Many rehabilitation settings may have a need for a SCI peer mentorship program. For instance, my Master's research identified a preliminary need for a peer support program expressed by the inpatients with SCI at a Chinese rehabilitation hospital (Shi et al., 2020). Participants reported multiple possible approaches of delivering the program, including a combination of online and in-person meetings. Participants also forecasted multiple challenges associated with the feasibility of implementing the program. For example, they noted that the implementation of the program might be difficult because it would significantly increase the workload for the hospital staff. In addition, participants reported concerns on the potential cost of the program as an addition to their healthcare service (Shi et al., 2020). Moreover, a Danish study highlighted the patients' needs for real-life experiential knowledge offered by peer mentors as a supplement to regular rehabilitation care (Hoffmann et al., 2019). However, this study only demonstrated the preliminary feasibility of implementing a nationwide peer mentorship program in Denmark, while lacking insights applicable to other contexts, such as Canada and China. Therefore,

understanding the potential barriers and facilitators within the local setting and identifying possible solutions is an essential process to achieve effective implementation of a SCI peer mentorship program in rehabilitation settings.

Understanding barriers and facilitators within the local context is an essential step to implement an innovation, in this case, a SCI peer mentorship program (Graham et al., 2006; Straus et al., 2011). As mentioned before, past research has provided a strong evidence-based support to the outcomes of peer mentorship interventions/programs, while some offered a general description of the interventions/programs delivery, such as length, frequency, and modality (Barclay & Hilton, 2019). However, little documentation was available on the implementation processes of SCI peer mentorship programs in rehabilitation settings (i.e., how a program is consistently implemented), including barriers and facilitators in the implementation process. This information can help inform the planning of future programs and the optimization of existing programs. It is important to notice that identifying barriers and facilitators can take place in any time during the implementation process, such as before or during the program implementation (Field et al., 2014).

Consolidated Framework of Implementation Science

The Consolidated Framework of Implementation Research (CFIR; Damschroder et al., 2009) is one of the most commonly used determinant frameworks to identify implementation barriers and facilitators (Esmail et al., 2020). CFIR was developed based on a synthesis of 20 existing theories (e.g., self-efficacy theory) and multiple empirical studies and thus includes a broad, comprehensive list of factors that can influence the implementation of a program/intervention. Originally, CFIR categorized 37 factors (e.g., evidence strength and quality) that into five domains: 1) intervention characteristics, 2) outer setting, 3) inner setting, 4)

characteristics of individuals, and 5) process. In 2022, CFIR was updated based on the feedback from the framework users (Park et al., 2017; Wang et al., 2023). Multiple factors (e.g., local attitudes, financing, work infrastructure, teaming) have been added to the five domains to make CFIR applicable to a wider range of contexts (Damschroder et al., 2022). CFIR includes barriers and facilitators at both individual level (e.g., motivation) and organizational level (e.g., partnerships and connections) and can be easily customized to diverse settings and scenarios by selecting the factors relevant to the local context (Damschroder et al., 2022).

Further, CFIR can be applied at different stages of an implementation process (Kirk et al., 2016). Most commonly, CFIR has been used to identify barriers and facilitators, as well as evaluate the delivery of ongoing programs/interventions in the implementation stage (Connell et al., 2014; Park et al., 2017; Stevens et al., 2022; Wang et al., 2023). The use of CFIR in the implementation stage allowed researchers to make decisions on the adaptations on the current intervention. For example, Forman et al. (2014) investigated the experiences of clinical staff members during early implementation of a medical home service. They found that the medical home service did not perfectly fit with the existing workflows at the local setting (CFIR construct: *compatibility*). Short-staffing, due to a low initial staffing ratio and a slow hiring process, as well as a lack of space in the local setting undermined the implementation process (CFIR construct: *available resources)*. The researchers used CFIR to identify ongoing issues during the implementation process and also provide recommendations to the future implementation and maintenance of the service. For example, integration of technology systems was suggested to address the poor communication between the clinical staff and patients to maintain the delivery of the service (CFIR construct: *communication)*. CFIR can also be used in the pre-implementation stage to identify potential barriers and facilitators. For one, Seljelid et al.

(2021) used CFIR to identify potential barriers and facilitators to implementing a digital patient-provider communication intervention at two outpatient clinics. They conducted focus groups, workshops, and project steering committee meetings with 14 local healthcare providers and two patients. Eighteen potential barriers and facilitators were found according to the CFIR constructs. Potential facilitators included an internal ownership to the intervention (CFIR construct: *intervention sour*ce), a positive attitude towards the intervention (CFIR construct: *knowledge and beliefs*), and active engagement of the heads of the clinics (CFIR construct: *leadership*). Potential barriers included heavy technical demand for patients (CFIR construct: *patient needs and resources*). The use of CFIR in the pre-implementation stage can support the implementation preparation and tailor the intervention to the intended context. Although Forman et al. (2014) and Seljelid et al. (2021) did not use CFIR in a SCI peer mentorship context, they showcased the usage of CFIR in gathering and analyzing the perspectives of local health professionals and patients to inform effective implementation.

For one, Lamontagne et al. (2019) used CFIR to guide the implementation of a new online peer-mentor training program for individuals with SCI. This program aimed to equip peer mentor volunteers with skills in providing quality mentorship. The researchers first explored the local implementation context by investigating the attitude and readiness to the program implementation of staff members (directors, managers, and client service specialists) from four community-based SCI organizations. Next, they identified the potential barriers and facilitators to the implementation of the program. Last, they assessed the peer mentors' implementation behaviors by sending the mentors a questionnaire pre- and post-implementation. The results showed that participants had a positive attitude and a strong readiness towards the program implementation. Some facilitators (e.g., alignment with the organizational culture and values)

and barriers (e.g., lack of financial support) were identified based on CFIR. The mentors reported an increase in their perceived knowledge about mentoring, organizational characteristics, and behavioral regulation. This study provided some insights on the implementation process and indicated the feasibility of the mentor training program. In addition, the study demonstrated the applicability of CFIR in the SCI peer mentorship context.

There are some advantages of using CFIR to guide the implementation of a SCI peer mentorship program. First, CFIR links its barriers and facilitators to a number of implementation strategies (Waltz et al., 2019). Powell et al. (2015) developed the Expert Recommendations for Implementing Change (ERIC) that included 73 actionable implementation strategies that correspond to the CFIR constructs (e.g., ERIC strategy: *develop and implement tools for quality monitoring* to CFIR construct: *reflecting & evaluating*). This matching tool can help researchers select implementation strategies to mitigate barriers and leverage facilitators identified. Second, CFIR has been used across various contexts, including rehabilitation settings in many different countries and regions, demonstrating high applicability (Kirk et al., 2016). CFIR was originally developed in English and has been translated into multiple languages, including Chinese. Chinese researchers have used CFIR to identify barriers and facilitators of program/intervention (e.g., mobile health education intervention for patients after knee operation) implementation in the rehabilitation context (Guo et al., 2023; Zhao et al., 2021; Zhou et al., 2021). Applying CFIR to understand and guide implementation can therefore facilitate common language across contexts while systemizing the process and increasing the likelihood of uptake of knowledge and change in practice (English, 2013).

To ensure the proper use of CFIR, researchers need to recognize limitations of this model. First, CFIR is not “full-spectrum” and thus require researchers to capture barriers and

facilitators that may exist beyond the scope of CFIR using an inductive approach. Second, one drawback of CFIR is that it did not specify the interrelationship between its constructs or the relative importance of the constructs (Esmail et al., 2020). To address this issue, recent studies started exploring the relationships between some of the CFIR constructs. For one, Sarkies et al. (2020) found some unidirectional relationships (e.g., *leaders* influence the *engagement* of multidisciplinary teams that lead implementation) between the CFIR constructs. Last, researchers should understand how to most meaningfully use CFIR by choosing the constructs that are most relevant to the context. Since CFIR has been applied in rehabilitation and SCI contexts (e.g., Lamontagne et al., 2019), prioritizing the barriers and facilitators identified in similar contexts may help justify the choices of the constructs (Kirk et al., 2016).

IKT Guiding Principles

Using theoretical frameworks, such as CFIR can help narrow the evidence-practice gap, but cannot guarantee successful knowledge mobilization. The knowledge mobilization process is still often slow and challenging in many contexts, including the SCI context. SCI knowledge users, including people with SCI, families, friends, organizations, health practitioners often lack access to research discoveries and their priorities are not reflected in the research agenda leading to further gaps between research and practice (Gainforth et al., 2021). To address this gap, the Integrated Knowledge Translation (IKT) Guiding Principles were developed to support and advocate research being done in a partnered approach (Gainforth et al., 2021). The principles are: 1) partner develop and maintain relationship based on trust, respect, dignity, and transparency; 2) partners share in decision-making; 3) partners foster open, honest, and responsive communication; 4) partners recognize, value, and share their diverse expertise and knowledge; 5) partners are flexible and receptive in tailoring the research approach to match the aims and

context of the project; 6) partners can meaningfully benefit by participating in the partnership; 7) partners address ethical considerations; 8) partners respect the practical considerations and financial constraints of all partners (ikt.ok.ubc.ca). The principles have been used by a group of university researchers who partnered with community-based SCI organizations to investigate the outcomes of SCI peer mentorship (Sweet et al., 2021b). Given the increasing diffusion and dissemination of the principles in the SCI research context (Shwed et al., 2023), adopting these principles may help university researchers to collaborate with rehabilitation and community organizations and address the needs of these organizations, such as implementing a SCI peer mentorship program.

References

Adams, C., Lobianco, A., Moseley, E., & Fitzpatrick, C. (2021). Understanding the impact of isolation due to COVID-19 on employment for Kentuckians with spinal cord injuries. *Journal of Vocational Rehabilitation*, *54*(1), 43–49. https://doi.org/10.3233/JVR-201116

Alizadeh, A., Dyck, S. M., & Karimi-Abdolrezaee, S. (2019). Traumatic spinal cord injury: An overview of pathophysiology, models and acute injury mechanisms. *Frontiers in Neurology*, *10,* 282. https://doi.org/10.3389/fneur.2019.00282

Balcazar, F. E., Kelly, E. H., Keys, C. B., & Balfanz-Vertiz, K. (2011). Using peer mentoring to support the rehabilitation of individuals with violently acquired spinal cord injuries. *Journal of Applied Rehabilitation Counseling*, *42*(4), 3–11. https://doi.org/10.1891/0047-2220.42.4.3

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191–215. https://doi.org/10.1037/0033-295X.84.2.191

Barclay, L., & Hilton, G. (2022). Chapter 39 - Spinal cord injury rehabilitation: Linking service delivery and community integration. In R. Rajendram, V. R. Preedy, & C. R. Martin (Eds.), *Diagnosis and Treatment of Spinal Cord Injury* (pp. 501–512). Academic Press. https://doi.org/10.1016/B978-0-12-822498-4.00039-7

Barclay, L., & Hilton, G. M. (2019). A scoping review of peer-led interventions following spinal cord injury. *Spinal Cord*, *57*(8), 626–635. https://doi.org/10.1038/s41393-019-0297-x

Barker, R. N., Kendall, M. D., Amsters, D. I., Pershouse, K. J., Haines, T. P., & Kuipers, P. (2009). The relationship between quality of life and disability across the lifespan for people with spinal cord injury. *Spinal Cord, 47*(2), 149-155. https://doi.org/10.1038/sc.2008.82

Bentzen, M., Brurok, B., Roeleveld, K., Hoff, M., Jahnsen, R., Wouda, M. F., & Baumgart, J. K. (2021). Changes in physical activity and basic psychological needs related to mental health among people with physical disability during the COVID-19 pandemic in Norway. *Disability and Health Journal*, *14*(4), 101126. https://doi.org/10.1016/j.dhjo.2021.101126

Butler Forslund, E., Jørgensen, V., Franzén, E., Opheim, A., Seiger, Å., Ståhle, A., Hultling, C., Stanghelle, J. K., Skavberg Roaldsen, K., & Wahman, K. (2017). High incidence of falls and fall-related injuries in wheelchair users with spinal cord injury: A prospective study of risk indicators. *Journal of Rehabilitation Medicine*, *49*(2), 144–151. https://doi.org/10.2340/16501977-2177

Cheng, C. L., Plashkes, T., Shen, T., Fallah, N., Humphreys, S., O'Connell, C., Linassi, A. G., Ho, C., Short, C., Ethans, K., Charbonneau, R., Paquet, J., & Noonan, V. K. (2017). Does specialized inpatient rehabilitation affect whether or not people with traumatic spinal cord injury return home? *Journal of Neurotrauma*, *34*(20), 2867–2876. https://doi.org/10.1089/neu.2016.4930

Chung, M. C., Preveza, E., Papandreou, K., & Prevezas, N. (2006). The relationship between posttraumatic stress disorder following spinal cord injury and locus of control. *Journal of Affective Disorders, 93*(1-3), 229-232. https://doi.org/10.1016/j.jad.2006.02.021

Conti, A., Clari, M., Kangasniemi, M., Martin, B., Borraccino, A., & Campagna, S. (2022). What self-care behaviours are essential for people with spinal cord injury? A systematic review and meta-synthesis. *Disability and Rehabilitation*, *44*(7), 991–1006. https://doi.org/10.1080/09638288.2020.1783703

Connell, L. A., McMahon, N. E., Harris, J. E., Watkins, C. L., & Eng, J. J. (2014). A formative evaluation of the implementation of an upper limb stroke rehabilitation intervention in

clinical practice: A qualitative interview study. *Implementation Science*, *9*(1), 90. https://doi.org/10.1186/s13012-014-0090-3

Damschroder, L. J., Aron, D. C., Keith, R. E., Kirsh, S. R., Alexander, J. A., & Lowery, J. C. (2009). Fostering implementation of health services research findings into practice: A consolidated framework for advancing implementation science. *Implementation Science*, *4*, 50. https://doi.org/10.1186/1748-5908-4-50

Damschroder, L. J., Reardon, C. M., Widerquist, M. A. O., & Lowery, J. (2022). The updated Consolidated Framework for Implementation Research based on user feedback. *Implementation Science*, *17*(1), 75. https://doi.org/10.1186/s13012-022-01245-0

Devlieger, P., & Balcazar, F. (2010). 'Bringing them back on the right track': Perceptions of medical staff on the rehabilitation of individuals with violently acquired spinal cord injuries. *Disability and Rehabilitation*, *32*(6), 444–451. https://doi.org/10.3109/09638280902919710

Ding, W., Hu, S., Wang, P., Kang, H., Peng, R., Dong, Y., & Li, F. (2022). Spinal cord injury: the global incidence, prevalence, and disability from the global burden of disease study 2019. *Spine, 47*(21), 1532-1540.

Divanoglou, A., & Georgiou, M. (2017). Perceived effectiveness and mechanisms of community peer-based programmes for Spinal Cord Injuries-a systematic review of qualitative findings. *Spinal cord, 55*(3), 225–234. https://doi.org/10.1038/sc.2016.147

Divanoglou, A., Tasiemski, T., Augutis, M., & Trok, K. (2017). Active Rehabilitation—a community peer-based approach for persons with spinal cord injury: International utilisation of key elements. *Spinal Cord*, *55*(6), 545-552. https://doi.org/10.1038/sc.2017.28

Divanoglou, A., Trok, K., Jörgensen, S., Hultling, C., Sekakela, K., & Tasiemski, T. (2019). Active Rehabilitation for persons with spinal cord injury in Botswana – effects of a community peer-based programme. *Spinal Cord*, *57*(10), 897–905. https://doi.org/10.1038/s41393-019-0300-6

Dwyer, K. J., & Mulligan, H. (2015). Community reintegration following spinal cord injury: Insights for health professionals in community rehabilitation services in New Zealand. *New Zealand Journal of Physiotherapy*, *43*(3), 75-85. https://doi.org/10.15619/NZJP/43.3.02

Dybwad, M. H., & Wedege, P. (2022). Peer mentorship: A key element in Active Rehabilitation. *British Journal of Sports Medicine*, *56*(22), 1322–1323. https://doi.org/10.1136/bjsports-2022-105995

Dzurenko, J. (2005). Rehabilitation Nursing: Educating Patients Toward Independence. In H. H. Zaretsky, E. F. I. ; Richter, & M. G. ; Eisenberg (Eds.), *Medical aspects of disability: A handbook for the rehabilitation professional* (pp. 737–750). Springer Publishing Company; US.

Elfström, M. L., & Kreuter, M. (2006). Relationships between locus of control, coping strategies and emotional well-being in persons with spinal cord lesion. *Journal of Clinical Psychology in Medical Settings*, *13*(1), 89–100. https://doi.org/10.1007/s10880-005-9001-8

English, M. (2013). Designing a theory-informed, contextually appropriate intervention strategy to improve delivery of paediatric services in Kenyan hospitals. *Implementation Science*, *8*(1), 39. https://doi.org/10.1186/1748-5908-8-39

Esmail, R., Hanson, H. M., Holroyd-Leduc, J., Brown, S., Strifler, L., Straus, S. E., Niven, D. J., & Clement, F. M. (2020). A scoping review of full-spectrum knowledge translation theories, models, and frameworks. *Implementation Science*, *15*(1), 11. https://doi.org/10.1186/s13012-020-0964-5

Feigin, V. L., Nichols, E., Alam, T., Bannick, M. S., Beghi, E., Blake, N., Culpepper, W. J., Dorsey, E. R., Elbaz, A., Ellenbogen, R. G., Fisher, J. L., Fitzmaurice, C., Giussani, G., Glennie, L., James, S. L., Johnson, C. O., Kassebaum, N. J., Logroscino, G., Marin, B., … Vos, T. (2019). Global, regional, and national burden of neurological disorders, 1990–2016: A systematic analysis for the Global Burden of Disease Study 2016. *The Lancet Neurology*, *18*(5), 459–480. https://doi.org/10.1016/S1474-4422(18)30499-X

Field, B., Booth, A., Ilott, I., & Gerrish, K. (2014). Using the Knowledge to Action Framework in practice: A citation analysis and systematic review. *Implementation Science*, *9*(1), 172. https://doi.org/10.1186/s13012-014-0172-2

Forman, J., Harrod, M., Robinson, C., Annis-Emeott, A., Ott, J., Saffar, D., Krein, S. L., & Greenstone, C. L. (2014). First things first: Foundational requirements for a medical home in an academic medical center. *Journal of General Internal Medicine*, *29*(Suppl 2), S640-648. https://doi.org/10.1007/s11606-013-2674-z

Fortin-Bédard, N., de Serres-Lafontaine, A., Best, K. L., Rahn, C., Turcotte, E., Borisoff, J., Sweet, S. N., Arbour-Nicitopoulos, K. P., & Routhier, F. (2022). Experiences of social participation for Canadian wheelchair users with spinal cord injury during the first wave of the COVID-19 pandemic. *Disabilities*, *2*(3), 398-414. https://doi.org/10.3390/disabilities2030028

Gainforth, H. L., Giroux, E. E., Shaw, R. B., Casemore, S., Clarke, T. Y., McBride, C. B., Garnett, C. V., & Sweet, S. N. (2019). Investigating characteristics of quality peer mentors with spinal cord injury. *Archives of Physical Medicine and Rehabilitation*, *100*(10), 1916–1923. https://doi.org/10.1016/j.apmr.2019.04.019

García-Rudolph, A., Saurí, J., López Carballo, J., Cegarra, B., Wright, M. A., Opisso, E., & Tormos, J. M. (2022). The impact of COVID-19 on community integration, quality of life, depression and anxiety in people with chronic spinal cord injury. *The Journal of Spinal Cord Medicine*, *45*(5), 681–690. https://doi.org/10.1080/10790268.2021.1922230

Gassaway, J., Jones, M. L., Sweatman, W. M., & Young, T. (2019). Peer-led, transformative learning approaches increase classroom engagement in care self-management classes during inpatient rehabilitation of individuals with spinal cord injury. *The Journal of Spinal Cord Medicine*, *42*(3), 338–346. https://doi.org/10.1080/10790268.2017.1385992

Gassaway, J., Jones, M., Sweatman, M., & Young, T. (2017). Peer-led, transformative learning approaches increase classroom engagement in care self-management classes during inpatient rehabilitation of individuals with spinal cord injury. *The Journal of Spinal Cord Medicine*, *42*, 1–9. https://doi.org/10.1080/10790268.2017.1385992

Gedde, M. H., Lilleberg, H. S., Aßmus, J., Gilhus, N. E., & Rekand, T. (2019). Traumatic vs non-traumatic spinal cord injury: A comparison of primary rehabilitation outcomes and complications during hospitalization. *The Journal of Spinal Cord Medicine*, *42*(6), 695–701. https://doi.org/10.1080/10790268.2019.1598698

Graham, I. D., Logan, J., Harrison, M. B., Straus, S. E., Tetroe, J., Caswell, W., & Robinson, N. (2006). Lost in knowledge translation: Time for a map? *Journal of Continuing Education in the Health Professions*, *26*(1), 13–24. https://doi.org/10.1002/chp.47

Guo, Y., Li, D., Wu, Y. B., Sun, X., Sun, X. Y., & Yang, Y. P. (2023). Mobile health-based home rehabilitation education improving early outcomes after anterior cruciate ligament reconstruction: A randomized controlled clinical trial. *Frontiers in Public Health, 10*, 1042167. doi: 10.3389/fpubh.2022.1042167

Gupta, A., Taly, A. B., Srivastava, A., & Murali, T. (2009). Non-traumatic spinal cord lesions: Epidemiology, complications, neurological and functional outcome of rehabilitation. *Spinal Cord*, *47*(4), 307-311. https://doi.org/10.1038/sc.2008.123

Haas, B. M., Price, L., & Freeman, J. A. (2013). Qualitative evaluation of a Community Peer Support Service for people with spinal cord injury. *Spinal Cord*, *51*(4), 295–299. https://doi.org/10.1038/sc.2012.143

Hao, D., Du, J., Yan, L., He, B., Qi, X., Yu, S., Zhang, J., Zheng, W., Zhang, R., Huang, D.-G., Yang, J., Zhu, M., Ouyang, J., Zhao, H., Ding, K., Shi, H., Cao, Y., Zhang, Y., Tang, Q., … Chen, Q. (2021). Trends of epidemiological characteristics of traumatic spinal cord injury in China, 2009–2018. *European Spine Journal*, *30*(10), 3115–3127. https://doi.org/10.1007/s00586-021-06957-3

Hayes, E., & Balcazar, F. (2008). Peer-mentoring and disability: current applications and future directions. *Focus on Disability: Trends in Research and Application*, 89-108.

Hernandez *, B. (2005). A voice in the chorus: Perspectives of young men of color on their disabilities, identities, and peer-mentors. *Disability & Society*, *20*(2), 117–133. https://doi.org/10.1080/09687590500059051

Hoffmann, D. D., Sundby, J., Biering-Sørensen, F., & Kasch, H. (2019). Implementing volunteer peer mentoring as a supplement to professional efforts in primary rehabilitation of

persons with spinal cord injury. *Spinal Cord, 57*(10), 881-889. doi:10.1038/s41393-019-0294-0.

Houlihan, B. V., Brody, M., Everhart-Skeels, S., Pernigotti, D., Burnett, S., Zazula, J., Green, C., Hasiotis, S., Belliveau, T., Seetharama, S., Rosenblum, D., & Jette, A. (2017). Randomized trial of a peer-led, telephone-based empowerment intervention for persons with chronic spinal cord injury improves health self-management. *Archives of Physical Medicine and Rehabilitation*, *98*(6), 1067-1076.e1. https://doi.org/10.1016/j.apmr.2017.02.005

Jones, M. L., Gassaway, J., & Sweatman, W. M. (2021). Peer mentoring reduces unplanned readmissions and improves self-efficacy following inpatient rehabilitation for individuals with spinal cord injury. *The Journal of Spinal Cord Medicine*, *44*(3), 383–391. https://doi.org/10.1080/10790268.2019.1645407

Khadour, F. A., Khadour, Y. A., Ebrahem, B. M., Meng, L., XinLi, C., & Xu, T. (2023). Impact of the COVID-19 pandemic on the quality of life and accessing rehabilitation services among patients with spinal cord injury and their fear of COVID-19. *Journal of Orthopaedic Surgery and Research*, *18*(1), 319. https://doi.org/10.1186/s13018-023-03804-7

Khadour, F. A., Khadour, Y. A., Meng, L., XinLi, C., & Xu, T. (2024). Epidemiology features of traumatic and non-traumatic spinal cord injury in China, Wuhan. *Scientific Reports, 14*(1), 1640. https://doi.org/10.1038/s41598-024-52210-4

Kirk, M. A., Kelley, C., Yankey, N., Birken, S. A., Abadie, B., & Damschroder, L. (2016). A systematic review of the use of the Consolidated Framework for Implementation Research. *Implementation Science*, *11*(1), 72. https://doi.org/10.1186/s13012-016-0437-z

Koh, P. P. W., & Mortenson, W. B. (2023). Evaluating a pilot community-based self-management program for adults with spinal cord injury. *Journal of Spinal Cord Medicine*, 1-12. https://doi.org/10.1080/10790268.2023.2220510

Lamontagne, M.-E., Best, K. L., Clarke, T., Dumont, F. S., & Noreau, L. (2019). Implementation evaluation of an online peer-mentor training program for individuals with spinal cord injury. *Topics in Spinal Cord Injury Rehabilitation*, *25*(4), 303–315. https://doi.org/10.1310/sci19-00002

Latimer-Cheung, A. E., Martin Ginis, K. A., Hicks, A. L., Motl, R. W., Pilutti, L. A., Duggan, M., Wheeler, G., Persad, R., & Smith, K. M. (2013). Development of evidence-informed physical activity guidelines for adults with multiple sclerosis. *Archives of Physical Medicine and Rehabilitation*, *94*(9), 1829-1836.e7. https://doi.org/10.1016/j.apmr.2013.05.015

Lenehan, B., Street, J., Kwon, B. K., Noonan, V., Zhang, H., Fisher, C. G., & Dvorak, M. F. (2012). The epidemiology of traumatic spinal cord injury in British Columbia, Canada. *Spine*, *37*(4), 321–329. https://doi.org/10.1097/BRS.0b013e31822e5ff8

Lude, P., Kennedy, P., Elfström, M., & Ballert, C. (2014). Quality of life in and after spinal cord injury rehabilitation: a longitudinal multicenter study. *Topics in Spinal Cord Injury Rehabilitation, 20*(3), 197-207.

Magasi, S., & Papadimitriou, C. (2022). Peer support interventions in physical medicine and rehabilitation: A framework to advance the field. *Archives of Physical Medicine and Rehabilitation*, *103*(7), S222–S229. https://doi.org/10.1016/j.apmr.2020.09.400

Martin Ginis, K. A., Papathomas, A., Perrier, M.-J., & Smith, B. (2017). Psychosocial factors associated with physical activity in ambulatory and manual wheelchair users with spinal

cord injury: A mixed-methods study. *Disability and Rehabilitation*, *39*(2), 187–192. https://doi.org/10.3109/09638288.2015.1045991

Martin Ginis, K. A., Shaw, R. B., Stork, M. J., Battalova, A., & McBride, C. B. (2018). Pilot study of a training program to enhance transformational leadership in spinal cord injury peer mentors. *Spinal Cord Series and Cases*, *4*(1), 34. https://doi.org/10.1038/s41394-018-0065-8

Matsuoka, M., & Sumida, M. (2022). The effect of the COVID-19 pandemic on the health-related quality of life in home-based patients with spinal cord injuries in Japan. *The Journal of Spinal Cord Medicine*, *45*(5), 760–764. https://doi.org/10.1080/10790268.2021.1953313

McIntyre, A., Marrocco, S. L., McRae, S. A., Sleeth, L., Hitzig, S., Jaglal, S., Linassi, G., Munce, S., & Wolfe, D. L. (2020). A scoping review of self-management interventions following spinal cord injury. *Topics in Spinal Cord Injury Rehabilitation*, *26*(1), 36–63. https://doi.org/10.1310/SCI2601-36

McKay, R. C., Giroux, E. E., Baxter, K. L., Casemore, S., Clarke, T. Y., McBride, C. B., Sweet, S. N., & Gainforth, H. L. (2022). Investigating the peer mentor-mentee relationship: Characterizing peer mentorship conversations between people with spinal cord injury. *Disability and Rehabilitation*, *45*(6), 962–973. https://doi.org/10.1080/09638288.2022.2046184

Mesa, A., Grasdal, M., Leong, S., Dean, N. A., Marwaha, A., Lee, A., Berger, M. J., Bundon, A., & Krassioukov, A. V. (2022). Effect of the COVID-19 pandemic on individuals with spinal cord injury: Mental health and use of telehealth. *PM&R*, *14*(12), 1439–1445. https://doi.org/10.1002/pmrj.12900

Momsen, A.-M., Rasmussen, J. O., Nielsen, C. V., Iversen, M. D., & Lund, H. (2012). Multidisciplinary team care in rehabilitation: An overview of reviews. *Journal of Rehabilitation Medicine*, *44*(11), 901–912. https://doi.org/10.2340/16501977-1040

Newman, S. D., Toatley, S., Rodgers, M. D., Qanungo, S., Mueller, M., Denny, B., & Rodriguez, A. (2023). Feasibility of a community-based, online, peer-supported spinal cord injury self-management intervention: Protocol for a pilot wait-listed randomized trial. *JMIR Research Protocols*, *12*, e42688. https://doi.org/10.2196/42688

Noreau, L., Fougeyrollas, P., & Boschen, K. (2002). Perceived influence of the environment on social participation among individuals with spinal cord injury. *Topics in Spinal Cord Injury Rehabilitation, 7*(3), 56-72.

Noreau, L., Fougeyrollas, P., Post, M., & Asano, M. (2005). Participation after spinal cord injury: the evolution of conceptualization and measurement. *Journal of Neurologic Physical Therapy, 29*(3), 147-156.

Noreau, L., Noonan, V. K., Cobb, J., Leblond, J., & Dumont, F. S. (2014). Spinal cord injury community survey: A national, comprehensive study to portray the lives of canadians with spinal cord injury. *Topics in Spinal Cord Injury Rehabilitation, 20*(4), 249–264. https://doi.org/10.1310/sci2004-249

Park, S.-W., Ko, S., An, H., Bang, J. H., & Chung, W.-Y. (2017). Implementation of central line-associated bloodstream infection prevention bundles in a surgical intensive care unit using peer tutoring. *Antimicrobial Resistance and Infection Control*, *6*(1), 103. https://doi.org/10.1186/s13756-017-0263-3

Pellatt, G. C. (2007). Patients, doctors, and therapists perceptions of professional roles in spinal cord injury rehabilitation: Do they agree? *Journal of Interprofessional Care*, *21*(2), 165–177. https://doi.org/10.1080/13561820701195567

Powell, B. J., Waltz, T. J., Chinman, M. J., Damschroder, L. J., Smith, J. L., Matthieu, M. M., Proctor, E. K., & Kirchner, J. E. (2015). A refined compilation of implementation strategies: Results from the Expert Recommendations for Implementing Change (ERIC) project. *Implementation Science*, *10*(1), 21. https://doi.org/10.1186/s13012-015-0209-1

Praxis Spinal Cord Institute. (2021). Rick Hansen Spinal Cord Injury Registry-A look at traumatic spinal cord injury in Canada in 2019.

Roberts, T. T., Leonard, G. R., & Cepela, D. J. (2017). Classifications In Brief: American Spinal Injury Association (ASIA) Impairment Scale. *Clinical Orthopaedics and Related Research*, *475*(5), 1499–1504. https://doi.org/10.1007/s11999-016-5133-4

Robinson-Whelen, S., Hughes, R. B., Taylor, H. B., Holmes, S. A., Rodriquez, J., & Manohar, S. (2023). Impacts of the COVID-19 pandemic on people with spinal cord injury. *Rehabilitation Psychology*, *68*(1), 1–11. https://doi.org/10.1037/rep0000480

Rocchi, M. A., Shi, Z., Shaw, R. B., McBride, C. B., & Sweet, S. N. (2022). Identifying the outcomes of participating in peer mentorship for adults living with spinal cord injury: A qualitative meta-synthesis. *Psychology & Health*, *37*(4), 523–544. https://doi.org/10.1080/08870446.2021.1890729

Sarkies, M., Long, J. C., Pomare, C., Wu, W., Clay-Williams, R., Nguyen, H. M., Francis-Auton, E., Westbrook, J., Levesque, J.-F., Watson, D. E., & Braithwaite, J. (2020). Avoiding unnecessary hospitalisation for patients with chronic conditions: A systematic review of

implementation determinants for hospital avoidance programmes. *Implementation Science*, *15*(1), 91. https://doi.org/10.1186/s13012-020-01049-0

Seljelid, B., Varsi, C., Nes, L. S., Øystese, K. A., & Børøsund, E. (2021). A digital patient-provider communication intervention (InvolveMe): Qualitative study on the implementation preparation based on identified facilitators and barriers. *Journal of Medical Internet Research*, *23*(4), e22399. https://doi.org/10.2196/22399

Selph, S. S., Skelly, A. C., Wasson, N., Dettori, J. R., Brodt, E. D., Ensrud, E., Elliot, D., Dissinger, K. M., Hart, E., Kantner, S., Graham, E., Junge, M., Dana, T., & McDonagh, M. (2021). Physical activity and the health of wheelchair users: A systematic review in multiple sclerosis, cerebral palsy, and spinal cord injury. *Agency for Healthcare Research and Quality (US)*.

Shaw, R. B., McBride, C. B., Casemore, S., & Martin Ginis, K. A. (2018). Transformational mentoring: Leadership behaviors of spinal cord injury peer mentors. *Rehabilitation Psychology*, *63*(1), 131–140. https://doi.org/10.1037/rep0000176

Shaw, R. B., Sweet, S. N., McBride, C. B., Adair, W. K., & Martin Ginis, K. A. (2019). Operationalizing the reach, effectiveness, adoption, implementation, maintenance (RE-AIM) framework to evaluate the collective impact of autonomous community programs that promote health and well-being. *BMC Public Health*, *19*(1), 803. https://doi.org/10.1186/s12889-019-7131-4

Sherman, J. E., DeVinney, D. J., & Sperling, K. B. (2004). Social support and adjustment after spinal cord injury: Influence of past peer-mentoring experiences and current live-in partner. *Rehabilitation Psychology*, *49*(2), 140–149. https://doi.org/10.1037/0090-5550.49.2.140

Shi, Z., Koch, J., Schaefer, L., Li, Q., Wang, L., & Sweet, S. N. (2020). Exploring how Chinese adults living with spinal cord injury viewed the prospect of inpatient peer support programs within a hospital-based rehabilitation setting. *Spinal Cord*, *58*(11), 1206-1215. https://doi.org/10.1038/s41393-020-0490-y

Shwed, A., Hoekstra, F., Bhati, D., Athanasopoulos, P., Chernesky, J., Martin Ginis, K., McBride, C. B., Mortenson, W. B., Sibley, K. M., Sweet, S. N., Gainforth, H. L., & SCI Guiding Principles Panel. (2023). IKT Guiding Principles: Demonstration of diffusion and dissemination in partnership. *Research Involvement and Engagement*, *9*(1), 53. https://doi.org/10.1186/s40900-023-00462-1

Silva, N. A., Sousa, N., Reis, R. L., & Salgado, A. J. (2014). From basics to clinical: A comprehensive review on spinal cord injury. *Progress in Neurobiology*, *114*, 25–57. https://doi.org/10.1016/j.pneurobio.2013.11.002

Smith, B. & Sparkes, C. A. (2016). *Routledge Handbook of Qualitative Research in Sport and Exercise*. Routledge.

Stevens, B., Bueno, M., Rao, M., Almeida, C., Cotic, A., Streitenberger, L., Fleming-Carroll, B., & Breen-Reid, K. (2022). An exploratory case study investigating the implementation of a novel knowledge translation strategy in a pandemic: The Pandemic Practice Champion. *Implementation Science Communications*, *3*(1), 45. https://doi.org/10.1186/s43058-022-00294-2

Straus, S. E., Tetroe, J. M., & Graham, I. D. (2011). Knowledge translation is the use of knowledge in health care decision making. *Journal of Clinical Epidemiology*, *64*(1), 6–10. https://doi.org/10.1016/j.jclinepi.2009.08.016

Sweet, S. N., Hennig, L., Pastore, O. L., Hawley, S., Clarke, T. Y., Flaro, H., Schaefer, L., & Gainforth, H. L. (2021a). Understanding peer mentorship programs delivered by Canadian SCI community-based organizations: Perspectives on mentors and organizational considerations. *Spinal Cord*, *59*(12), 1285-1293. https://doi.org/10.1038/s41393-021-00721-6

Sweet, S. N., Hennig, L., Shi, Z., Clarke, T., Flaro, H., Hawley, S., Schaefer, L., & Gainforth, H. L. (2021b). Outcomes of peer mentorship for people living with spinal cord injury: Perspectives from members of Canadian community-based SCI organizations. *Spinal Cord*, *59*(12), 1301-1308. https://doi.org/10.1038/s41393-021-00725-2

Sweet, S. N., Noreau, L., Leblond, J., & Ginis, K. A. M. (2016). Peer support need fulfillment among adults with spinal cord injury: Relationships with participation, life satisfaction and individual characteristics. *Disability and Rehabilitation*, *38*(6), 558–565. https://doi.org/10.3109/09638288.2015.1049376

Sweet, S. N., Michalovic, E., Latimer-Cheung, A. E., Fortier, M., Noreau, L., Zelaya, W., & Martin Ginis, K. A. (2018). Spinal cord injury peer mentorship: Applying self-determination theory to explain quality of life and participation. *Archives of Physical Medicine and Rehabilitation*, *99*(3), 468-476.e12. https://doi.org/10.1016/j.apmr.2017.08.487

Sweet, S., Noreau, L., Leblond, J., & Dumont, F. (2014). Understanding quality of life in adults with spinal cord injury via SCI-related needs and secondary complications. *Topics in Spinal Cord Injury Rehabilitation*, *20*(4), 321–328. https://doi.org/10.1310/sci2004-321

Sweis, R., & Biller, J. (2017). Systemic Complications of Spinal Cord Injury. *Current Neurology and Neuroscience Reports*, *17*(1), 8. https://doi.org/10.1007/s11910-017-0715-4

Taylor, H. B., Hughes, R. B., Gonzalez, D., Bhattarai, M., & Robinson-Whelen, S. (2023). Psychosocial impacts of the COVID-19 pandemic on women with spinal cord injury. *International Journal of Environmental Research and Public Health*, *20*(14), 6387. https://doi.org/10.3390/ijerph20146387

Van Der Meer, P., Post, M. W. M., Van Leeuwen, C. M. C., Van Kuppevelt, H. J. M., Smit, C. A. J., & Van Asbeck, F. W. A. (2017). Impact of health problems secondary to SCI one and five years after first inpatient rehabilitation. *Spinal Cord*, *55*(1), 98–104. https://doi.org/10.1038/sc.2016.103

Veith, E. M., Sherman, J. E., Pellino, T. A., & Yasui, N. Y. (2006). Qualitative analysis of the peer-mentoring relationship among individuals with spinal cord injury. *Rehabilitation Psychology*, *51*(4), 289–298. https://doi.org/10.1037/0090-5550.51.4.289

Waltz, T. J., Powell, B. J., Fernández, M. E., Abadie, B., & Damschroder, L. J. (2019). Choosing implementation strategies to address contextual barriers: Diversity in recommendations and future directions. *Implementation Science*, *14*(1), 42. https://doi.org/10.1186/s13012-019-0892-4

Wang, H., Zhang, Y., & Yue, S. (2023). Exploring barriers to and facilitators of the implementation of home rehabilitation care for older adults with disabilities using the Consolidated Framework for Implementation Research (CFIR). *BMC Geriatrics*, *23*(1), 292. https://doi.org/10.1186/s12877-023-03976-1

World Health Organization (2001). *International Classification of Functioning, Disability and* Health: ICF. World Health Organization.

Yuan, S., Shi, Z., Cao, F., Li, J., & Feng, S. (2018). Epidemiological features of spinal cord injury in China: A systematic review. *Frontiers in Neurology*, *9*, 683. https://doi.org/10.3389/fneur.2018.00683

Zhao, B., Zhang, X., Huang, R., Yi, M., Dong, X., & Li, Z. (2021). Barriers to accessing internet-based home care for older patients: A qualitative study. *BMC Geriatrics*, *21*(1), 565. https://doi.org/10.1186/s12877-021-02474-6

Zhou, R., Cheng, J., Wang, S., & Yao, N. (2021). A qualitative study of home health care experiences among Chinese homebound adults. *BMC Geriatrics*, *21*(1), 309. https://doi.org/10.1186/s12877-021-02258-y

Chapter Three: Interprofessional efforts to implement peer mentorship programs for people with spinal cord injury in rehabilitation settings

Zhiyang Shi[1,2], Gordon A. Bloom[1,2], Heather L. Gainforth[3,4], Aliki Thomas[1,2], & Shane N. Sweet[1,2]

McGill University[1]

Centre for Interdisciplinary Rehabilitation Research in Metropolitan Montreal[2]

University of British Columbia Okanagan[3]

International Collaboration on Repair Discoveries[4]

(Submitted)

Abstract

This study aimed to identify and compare barriers, facilitators, and potential solutions to implement a prospective spinal cord injury (SCI) peer mentorship program at two rehabilitation hospitals, one in China and one in Canada. Twenty-four health professionals participated in the study. Data were analyzed using a cross-case approach. At an individual level, four common facilitators for both rehabilitation hospitals were: *engaging patients with SCI* by structuring informal peer interactions, *engaging health professionals* in the program implementation and coordination, *high-level leaders* providing frontline health professionals with financial and instrumental support, and health professionals' *motivation* to implement the program. Two common barriers were health professionals' *low capability* and *opportunity* to implement the program. One unique facilitator for the Chinese hospital was to assign *implementation leads*. At an organizational level, one common facilitator for both rehabilitation hospitals was the patient-centered organizational *culture*. For the Canadian hospital, their *partnership and connections* with a community-based SCI organization and collaborative *work infrastructure* were facilitators. For the Chinese hospital, team separation within the local *work infrastructure* was a barrier. Overall, establishing interprofessional collaboration between high-level leaders, health professionals, and SCI mentors and identifying available organizational resources may be key pre-implementation processes to implement SCI peer mentorship programs in rehabilitation settings.

Key words: Spinal Cord Injury, Peer Support, Rehabilitation, Qualitative Research, Canada, China

Interprofessional efforts to implement peer mentorship programs for people with spinal cord injury in rehabilitation settings

Introduction

Following a spinal cord injury (SCI), an individual's life can be changed by the loss of autonomic, motor, and sensory functions (Alizadeh et al., 2019). One way of building support systems for individuals with SCI is through peer mentorship. Peer mentorship is a purposeful and unidirectional relationship where a mentor shares their lived experience with a mentee who has similar life challenges (Sherman et al., 2004; Hayes & Balcazar, 2008). Peer mentorship can be delivered in rehabilitation settings by community-based organizations through structured programs and benefit people's transition into the community (Barclay & Hilton, 2022; Rocchi et al., 2022; Shaw et al., 2019; Shi et al., 2023; Sweet et al., 2021). Depending on local healthcare system and individual differences in their SCI conditions, the length of one's rehabilitation process can range from a few weeks to several months (Cheng et al., 2017). The in- and out-patient rehabilitation period is an ideal time to establish peer mentorship relationships (Sweet et al., 2021).

Different approaches have been utilized to integrate SCI peer mentorship programs within rehabilitation settings. Some programs were established internally by identifying mentors within the rehabilitation settings (Gassaway et al., 2019; Hernandez, 2005; Hoffmann et al., 2019; Jones et al., 2021), while others relied on interprofessional collaboration between community-based SCI organizations and rehabilitation institutions (McKay et al., 2022; Shi et al., 2023; Sweet et al., 2021). Unfortunately, descriptions of these programs mostly included reports of the delivery modalities, such as the mentor-mentee conversation topics, and rarely highlighted how interprofessional collaboration can be effectively applied in rehabilitation

settings with carious organizational structures, needs, resources, and cultural backgrounds. We therefore still lacked knowledge on the factors that could hinder or facilitate the development and delivery of peer mentorship programs prior to the implementation (also defined as the *pre-implementation* stage; Kirk et al., 2016). This lack of knowledge limits the development of evidence-informed approaches to optimising the creation and implementation of SCI peer mentorship programs within a rehabilitation context (Esmail et al., 2020). Research identifying barriers and facilitators in the pre-implementation stage of SCI peer mentorship program in rehabilitation settings is therefore needed.

The Consolidated Framework for Implementation Research (CFIR) is one of the most frequently used theoretical frameworks to investigate barriers and facilitators to innovative program implementation in various contexts, such as rehabilitation and SCI peer mentorship (Briggs et al., 2020; Damschroder et al., 2022; Daoust et al., 2021). Lamontagne et al. (2019) identified over 20 CFIR-based barriers and facilitators to implement an online training program for SCI peer mentors, demonstrating the utility of CFIR in this context. Therefore, the CFIR can be a useful framework to examine the implementation of SCI peer mentorship programs in rehabilitation settings (Shi et al., 2023).

The purpose of this study was to identify and compare barriers, facilitators, and potential solutions to implement a prospective peer mentorship program at two rehabilitation hospitals using the CFIR. Our research questions included: 1) what were the common and distinct barriers and facilitators to implementing a prospective peer mentorship program in the two rehabilitation hospitals? 2) what possible solutions to addressing/leveraging the barriers and facilitators did health professionals identify prior to the implementation of the program?

Methods

Our research team collaborated with the hospital staff from two rehabilitation hospitals to conceptualize this study in order to meet the desire of implementing SCI peer mentorship programs at each of the rehabilitation hospitals. We utilized the integrated knowledge translation (IKT) guiding principles to inform our approach in communicating with the hospital staff (Gainforth et al., 2021). The hospital staff from the two rehabilitation hospitals mainly contributed to the study design and participant recruitment. The positionality, philosophical assumptions, and research engagement of the researchers and hospital staff members were described in Appendix 3.A.

Design

A qualitative multiple case study design was used (Yin, 2017) to investigate two rehabilitation hospitals that had not implemented a SCI peer mentorship program when this study was conducted.

Cases Selection and Participants

Two rehabilitation hospitals were selected as the study cases because of their declared interests and needs in regard to implementing SCI peer mentorship programs. The first rehabilitation hospital in China reported an interest in implementing a SCI peer mentorship program after our team completed a study identifying patients' needs for peer mentorship (Shi et al., 2020). The second rehabilitation hospital in Canada reported a need for the implementation of a SCI peer mentorship program through informal discussion with our research team, that was later formalized to create this study. Despite having a common desire to implement a SCI peer mentorship program, the two rehabilitation hospitals have many differences in cultural backgrounds and organizational characteristics (Table 3.1).

Ten participants were recruited from the Rehabilitation Medicine Department of the Chinese hospital during 2020 and 2021. Fourteen participants were recruited from the Trauma and the Neuro unit of the Canadian hospital during 2021 and 2022. Eligible participants were adults, had no diagnosed cognitive impairments, spoke English, French, or Mandarin, and worked as a staff member (e.g., health professionals, team leads) at either of the rehabilitation hospitals over the past six months. Our hospital research collaborators provided basic contact information (name, work title, and email) of the eligible participants who agreed to share their information and be contacted by the research team. All participants obtained information on the study (e.g., purpose, research questions, procedures) and gave written consent prior to participation. Ethics approval was obtained from our university ethics board.

Data Collection

Within the Chinese hospital, one-on-one, audio-recorded interviews (n = 10) were conducted by the first author via teleconferencing during the COVID-19 pandemic. Within the Canadian hospital, we conducted one audio-recorded focus group with each of the three teams (i.e., the Trauma unit and two sub-teams of the Neuro unit) separately followed by eight individual interviews. Multiple focus groups ensured each group had up to five participants. The first author moderated the discussion. All interviews and focus groups were semi-structured using an interview guide (Appendix 3.B) consisting of the questions adapted from the CFIR interview guide tool (cfirguide.org/).

Data Analysis

Focus groups and interviews were transcribed verbatim and analyzed following the recommendations for a *cross-case analysis* approach (Adams et al., 2022). The first author began with analyzing each case (i.e., rehabilitation hospital) individually by coding the data collected

from each hospital deductively based on the constructs of the CFIR. Data relevant to the research questions but beyond the CFIR were coded inductively (Weatherson et al., 2017). Reflective notes were taken to document important ideas and decision-making throughout the coding and theme identification processes. Preliminary themes were identified within each case by categorizing the codes that were related (e.g., delivering a similar idea or was coded as the same CFIR construct). A single-case report consisting of the preliminary themes, definitions of the themes, corresponding quotes, and a descriptive summary of the quotes was developed by the first author for each case. Two single-case reports were sent to a co-author who first critically examined and challenged the first author on the preliminary quotes, codes, and themes. The co-authors and the first author met to overview and discuss the critical examination. The first author created a second modified report, which was reviewed and finalized with the inputs from the co-author.

Next, the first author looked at both single-case reports side-by-side and reviewed their reflective notes to identify common and distinct findings. For example, if CFIR constructs (e.g., available resources) were identified across both cases and interpreted as a similar theme (e.g., implementation facilitator), the quotes were merged in the cross-case analysis report. If a preliminary theme was only captured in one case (e.g., a barrier unique to one rehabilitation hospital), the theme and corresponding quotes were still included in the cross-case report. The cross-case report therefore included consolidated and unique themes from both cases. A co-author reviewed the quotes and themes in the cross-case report by challenging the first author's conceptualizations via comments. These two co-authors met twice to discuss their similar/different interpretations of the data and make mutual decisions on the organization of the themes.

Study Quality

The eight universal criteria for qualitative research were considered to ensure the study quality (Appendix 3.C; Tracy, 2010).

Results

Eleven barriers and facilitators to implementing a prospective SCI peer mentorship program were identified and then categorized into two themes: individual level considerations and institutional level considerations. Figure 3.1 provided an illustration of the results across the two cases. Table 3.2 summarized participants' information.

Individual Level Considerations

Engaging Innovation Recipients (patients with SCI)

A good starting point to develop a peer mentorship program could be identifying any existing approaches that patients use to interact with each other (e.g., social media group chats, conversations with former patients, coffee group meetings) [quote 1 in Table 3.3]. Both in- and out-patient rehabilitation settings are often a natural, organic environment for patients with SCI to have informal interactions [quote 2], which could be structured as a part of a peer mentorship program.

Creating a safe and minimally intimidating environment was highlighted as important to facilitate patients' engagement within a peer mentorship program. The health professionals saw themselves as helping to create this environment. They could gauge patients' readiness for peer interactions, particularly regarding their physical and mental health, and introduce patients to the program in order to minimize the intimidation factor [quote 3].

Engaging Innovation Deliverers (health professionals)

A key facilitator to implementing a peer mentorship program was health professionals' engagement in the implementation process. While health professionals are not directly delivering peer mentorship, health professionals at both rehabilitation hospitals reported being able to support the program. First, patients have different treatment schedules, which may require health professionals to coordinate and schedule time for peer interactions [quote 4]. Second, health professionals can verify and supplement the information shared by mentors through revisiting mentor-mentee conversations [quote 5]. Third, health professionals can set parameters of mentor-mentee interactions (e.g., choosing conversation topics, selecting competent peer mentors) to ensure a positive mentorship experience, while allowing space and time for peers to talk freely [quote 6].

Implementation Team Members

Across both rehabilitation hospitals, the health professionals demonstrated a strong **motivation** to implement and learn about peer mentorship. However, they reported lacking knowledge to deliver a peer mentorship program (i.e., low **capability***).* Additionally, a lack of time for health professionals to take in implementing a peer mentorship program was found to be another barrier (i.e., low **opportunity***)* given their priority is to provide health care services.

Some solutions to counter these barriers were discussed. If rehabilitation hospitals (e.g., the Canadian hospital) have access to resources offered by community-based organizations, health professionals may increase their knowledge on peer mentorship program delivery by having team meetings, information sessions, and email/newsletters with community-based organizations, as well as visiting rehabilitation hospitals that have implemented peer mentorship programs [quote 7]. If rehabilitation hospitals (e.g., the Chinese hospital) lack access to community-based resources, developing a pilot program and gathering feedback about the

program delivery from patients would be a starting point. A pilot program may attract health professionals to engage in the implementation process and provide them with learning opportunities [quote 8].

Taking on roles in implementing and coordinating a peer mentorship program would require health professionals to dedicate limited available work hours [quote 9]. To address this barrier, potential roles and responsibilities of health professionals within the program need to be clearly defined [quote 10]. Identifying staff who could serve as **implementation leads** (i.e., individuals who lead efforts to implement the innovation, a peer mentorship program in this case) was also a proposed solution. The workload of implementation leads could be adjusted and includes dedicated time to support the implementation of the peer mentorship program [quote 11].

High-level Leaders

Leadership of rehabilitation hospitals providing support can facilitate the implementation of a peer mentorship program. High-level leaders can offer financial support and accreditation to encourage frontline health professionals' engagement in the implementation process [quote 12]. High-level leaders could also assign implementation leads and adjust these individuals' work responsibilities accordingly [quote 13].

Institutional Level Considerations

Three barriers and/or facilitators were identified at the institutional level.

Team Culture

The health professionals at both rehabilitation hospitals reported having a patient-centered culture, meaning they were responsive and caring to patients' needs. This team culture

may increase the likelihood of implementing a peer mentorship program because the local health professionals are open to adopting innovations to address patients' needs [quote 14].

Work Infrastructure

Institutional policy and organization of workforce/staffing level can affect the team culture within rehabilitation hospitals, and thus affect the implementation of a peer mentorship program. For instance, the mandatory patient turnover rate at the Chinese hospital has shifted the team culture towards pursuing work efficiency. Within such an efficiency-oriented team culture, implementing an innovative peer mentorship program is unlikely to be a priority for the rehabilitation hospital [quote 15]. Another unique work infrastructure at the Chinese hospital is that the health professionals are separated into multiple independent teams. Each team receives their own patients and there may be differences in how they plan and deliver rehabilitation treatment. Some health professionals were concerned that peer interactions, particularly between those receiving treatment from different teams, might cause unnecessary comparisons and confusions on the quality of care among patients [quote 16]. By contrast, the Canadian hospital has two units that oversee patients with different types of SCI (traumatic vs. non-traumatic) and share a more collaborative relationship. The health professionals from the two units envisioned that they might join forces in delivering a peer mentorship program. For example, peer interactions and events could occur at the common spaces and facilities (e.g., gym, conference room) shared by the two units [quote 17].

Partnerships & Connections

Establishing and maintaining a quality partnership with community-based SCI organizations can facilitate the implementation of a peer mentorship program. The current Canadian hospital has a formal partnership with a local community-based organization; however,

their connection was deemed to be poor due to a lack of communication. This partnership can be strengthened by the community-based organization presenting their services more frequently at the rehabilitation hospital [quote 18]. Through a stronger partnership, the community-based organization may help the rehabilitation hospital structure mentorship activities by securing mentors and providing remuneration for mentors [quote 19]. Rehabilitation hospitals and community-based organizations can also work together to develop a clear structure of the program, including goals, mode of delivery, and responsibilities of mentors and health professionals [quote 20]. By contrast, the Chinese hospital appeared to have no connection with community-based SCI organizations. Such rehabilitation hospitals may need to identify and train mentors from its SCI clientele [21].

Discussion

This study aimed to identify and compare barriers, facilitators, and potential solutions to implementing a prospective SCI peer mentorship program at a Canadian and a Chinese rehabilitation hospital. Multiple common barriers (e.g., health professionals' lack of time) and facilitators (e.g., high-level leader support) were identified. The distinct barriers and facilitators were not necessarily associated with the cultural differences between the two rehabilitation hospitals (e.g., geography, language). The lack of cultural differences was unexpected, given the traditional values embedded in Canadian and Chinese cultures could affect how health professionals envision the implementation of a peer mentorship program (Youn et al., 2022). However, our results were consistent with multiple reviews that identified a similar set of implementation barriers and facilitators between Chinese and Western healthcare contexts (Juckett et al., 2019; Li et al., 2019; Zhao et al., 2022). These reviews highlighted that individuals' knowledge and skills, as well as organizational resources were the most prominent

determinants to implementation, regardless of the cultural contexts. In fact, the barriers and facilitators identified by the staff of the two rehabilitation hospitals in this study were mostly related to organizational characteristics.

One organizational difference is that the Canadian hospital primarily provides out-patient service to individuals with SCI, while the Chinese hospital mainly delivers in-patient services. Formal and informal peer interactions may occur frequently within in-patient settings because inpatients with SCI tend to share more mutual time (Zanca et al., 2013). Implementation of a peer mentorship program could be facilitated by integrating peer mentors into ongoing peer interactions, such as group therapy and events (Gassaway et al., 2019; Jones et al., 2021; Post et al., 2017). Another way could be integrating on-site peer mentors into the clinical environment to maximize their time shared with the patients (Shi et al., 2023). However, this approach might be less resource-effective for out-patient settings because they often experience uncertainty from patient choices and variable patient arrivals (Youn et al., 2022). Online delivery of peer mentorship (e.g., video-conferencing) might be an alternative for out-patient settings because of its feasibility and convenience (Barclay & Lalor, 2022; Newman et al., 2023; Shaw et al., 2022). It is only by comparing these two types of rehabilitation hospitals, we are able to recommend these different approaches to facilitating peer mentorship interactions.

Health professionals' engagement was identified as a key facilitator to implementing a SCI peer mentorship program, which was consistent with previous research in other healthcare contexts (Petkovic et al., 2020). Our study outlined a few unique roles that health professionals could play in SCI peer mentorship programs beyond the ones identified in the past research (e.g., matching mentors and mentees; Sweet et al., 2021). For example, health professionals could help foster positive mentorship experience by gauging patients' readiness for peer mentorship

introduction (Sweet et al., 2021). Therefore, defining health professionals' roles within a SCI peer mentorship program and establish their interprofessional collaboration with SCI mentors may be important processes in the pre-implementation stage.

Another organizational difference between the two rehabilitation hospitals was related to their access to community-based resources, particularly peer mentors. This difference may have a direct impact on the implementation of a peer mentorship program. Similar to the results in other rehabilitation contexts (Moncion et al., 2020; Torp & Bergheim, 2023), health professionals' lack of time due to job demands was identified as a key barrier in both rehabilitation hospitals. To address this barrier, rehabilitation hospitals may have external staff members (e.g., mentors, program coordinator) from community-based organizations oversee the implementation of a peer mentorship program (Shi et al., 2023). Time-related resources need to be available for health professionals to participate in the implementation of a peer mentorship program. The amount of time required may vary based on whether the rehabilitation hospital has access to community-based resources. In either case, rehabilitation hospitals may need to identify implementation leads who can dedicate time in serving as the program coordinator, event/activity organizer, or other similar responsibilities (Demes et al., 2020; Foster et al., 2018).

In line with the research in other contexts (e.g., Juckett et al., 2019; Lamontagne et al., 2019), "high-level leaders" support was described as a key facilitator for frontline health professionals to implement SCI peer mentorship programs in both rehabilitation hospitals. However, we lack consensus on *how* rehabilitation hospital leaders can appropriately support and engage in the implementation of SCI peer mentorship programs. Rehabilitation hospital leaders and frontline health professionals may need to discuss whether a "top-down" and a "bottom-up" approach would be the most effective to implement SCI peer mentorship programs (Imperial,

2021). A bottom-up approach through frontline health professionals demonstrating commitment and taking ownership in the implementation process has been shown to lead to optimal implementation outcomes (Bonawitz et al., 2020; Flynn et al., 2019). A top-down approach through mandating the program and assigning individuals with implementation tasks might be feasible for some rehabilitation hospitals but less so in hospitals with a greater focus on distributed leadership and more attention to clinician agency.

Practical Recommendations

Based on the results, we summarized potential solutions for rehabilitation hospitals to implement SCI peer mentorship programs:

- Establishing interprofessional collaboration between high-level leaders, health professionals, and SCI mentors by engaging these individuals to take on different roles in the implementation process;
- Assigning internal or external staff who lead efforts on implementing the program;
- Identifying available resources (e.g., existing peer interactions, partnerships with community-based SCI organization) that can be immediately accessed to initiate the implementation process.

Study Limitations

First, we did not conduct focus groups at the Chinese hospital due to the COVID-19 constraints. Participants did not have the opportunity to exchange perspectives with other participants. In addition, we used the CFIR constructs to structure the interview questions, resulting in fewer questions that could probe the specific needs and desired outcomes of the two rehabilitation hospitals. As a result, these limitations may have hindered our ability to capture some cultural nuances (e.g., individualism vs. collectivism) between the two contexts. Second,

the preliminary analysis was done by the first author individually, including the initial coding, quotes translation, and preliminary theme development. Some cultural nuances between the two cases might not be captured by the first author during the preliminary analysis despite his qualitative research experience and language proficiency. Finally, although we utilized the IKT guiding principles and attempted to establish a partnership with the two rehabilitation hospitals, the level of engagement of the hospital staff varied over time due to multiple factors, including the burden on healthcare system during the COVID-19 pandemic.

Conclusions

Using a multiple case design and the CFIR, this study identified which barriers and facilitators were common or distinct between two rehabilitation hospitals with unique cultural backgrounds and organizational characteristics. The results highlighted the importance of enhancing interprofessional collaboration between high-level leaders, health professionals, and SCI mentors in developing and implementing SCI peer mentorship programs in rehabilitation hospitals across various cultural contexts. In addition, assessing and leveraging available resources are key pre-implementation processes to implement SCI peer mentorship programs in rehabilitation settings with different organizational characteristics.

References

Adams, C., Minton, C. B., Hightower, J., & Blount, A. (2022). A systematic approach to multiple case study design in professional counseling and counselor education. *Journal of Counselor Preparation and Supervision*, *15*(2). Retrieved from https://digitalcommons.sacredheart.edu/jcps/vol15/iss2/24

Alizadeh, A., Dyck, S. M., & Karimi-Abdolrezaee, S. (2019). Traumatic spinal cord injury: An overview of pathophysiology, models and acute injury mechanisms. *Frontiers in Neurology*, *10,* 282. https://doi.org/10.3389/fneur.2019.00282

Barclay, L & Hilton, G. (2022). Spinal cord injury rehabilitation: Linking service delivery and community integration. In *Diagnosis and Treatment of Spinal Cord Injury* (pp. 501–512). Academic Press.

Barclay, L., & Lalor, A. (2022). Investigating the challenges and benefits of engaging in peer support via videoconferencing for people with spinal cord injury. *International Journal of Environmental Research and Public Health*, *19*(8), 4585. https://doi.org/10.3390/ijerph19084585

Bonawitz, K., Wetmore, M., Heisler, M., Dalton, V. K., Damschroder, L. J., Forman, J., Allan, K. R., & Moniz, M. H. (2020). Champions in context: Which attributes matter for change efforts in healthcare? *Implementation Science, 15*(1), 62. https://doi.org/10.1186/s13012-020-01024-9

Briggs, M. S., Rethman, K. K., Crookes, J., Cheek, F., Pottkotter, K., McGrath, S., DeWitt, J., Harmon-Matthews, L. E., & Quatman-Yates, C. C. (2020). Implementing patient-reported outcome measures in outpatient rehabilitation settings: A systematic review of facilitators and barriers using the consolidated framework for implementation research.

Archives of Physical Medicine and Rehabilitation, *101*(10), 1796–1812. https://doi.org/10.1016/j.apmr.2020.04.007

Cheng, C. L., Plashkes, T., Shen, T., Fallah, N., Humphreys, S., O'Connell, C., Linassi, A. G., Ho, C., Short, C., Ethans, K., Charbonneau, R., Paquet, J., & Noonan, V. K. (2017). Does Specialized Inpatient Rehabilitation Affect Whether or Not People with Traumatic Spinal Cord Injury Return Home? *Journal of Neurotrauma,* 34(20), 2867–2876. https://doi.org/10.1089/neu.2016.4930

Damschroder, L. J., Reardon, C. M., Opra Widerquist, M. A., & Lowery, J. (2022). Conceptualizing outcomes for use with the Consolidated Framework for Implementation Research (CFIR): The CFIR outcomes addendum. *Implementation Science*, *17*(1), 1-10. https://doi.org/10.1186/s13012-021-01181-5

Daoust, G., Rushton, P. W., Racine, M., Leduc, K., Assila, N., & Demers, L. (2021). Adapting the Wheelchair Skills Program for pediatric rehabilitation: Recommendations from key stakeholders. *BMC Pediatrics*, *21*(1), 103. https://doi.org/10.1186/s12887-021-02564-9

Demes, J. A. E., Nickerson, N., Farand, L., Montekio, V. B., Torres, P., Dube, J. G., Coq, J. G., Pomey, M. P., Champagne, F., & Jasmin, E. R. (2020). What are the characteristics of the champion that influence the implementation of quality improvement programs? *Evaluation and Program Planning*, *80*, 101795. https://doi.org/10.1016/j.evalprogplan.2020.101795

Esmail, R., Hanson, H.M., Holroyd-Leduc, J., Brown, S., Strifler, L., Strauss, S.E., Niven, D.J., & Clement, F.M. (2020). A scoping review of full-spectrum knowledge translation theories, models, and frameworks. *Implementation Science, 15*(1), 11. https://doi.org/10.1186/s13012-020-0964-5

Flynn, R., Rotter, T., Hartfield, D., Newton, A. S., & Scott, S. D. (2019). A realist evaluation to identify contexts and mechanisms that enabled and hindered implementation and had an effect on sustainability of a lean intervention in pediatric healthcare. *BMC Health Services Research*, *19*(1), 912. https://doi.org/10.1186/s12913-019-4744-3

Foster, A., Croot, L., Brazier, J., Harris, J., & O'Cathain, A. (2018). The facilitators and barriers to implementing patient reported outcome measures in organisations delivering health related services: A systematic review of reviews. *Journal of Patient-Reported Outcomes*, *2*(1), 46. https://doi.org/10.1186/s41687-018-0072-3

Gainforth, H. L., Hoekstra, F., McKay, R., McBride, C. B., Sweet, S. N., Martin Ginis, K. A., Anderson, K., Chernesky, J., Clarke, T., Forwell, S., Maffin, J., McPhail, L. T., Mortenson, W. B., Scarrow, G., Schaefer, L., Sibley, K. M., Athanasopoulos, P., Willms, R. (2021). Integrated knowledge translation guiding principles for conducting and disseminating spinal cord injury research in partnership. *Archives of Physical Medicine and Rehabilitation, 102*(4), 656–663. https://doi.org/10.1016/j.apmr.2020.09.393

Gassaway, J., Jones, M. L., Sweatman, W. M., & Young, T. (2019). Peer-led, transformative learning approaches increase classroom engagement in care self-management classes during inpatient rehabilitation of individuals with spinal cord injury. *The Journal of Spinal Cord Medicine*, *42*(3), 338–346. https://doi.org/10.1080/10790268.2017.1385992

Hayes, E., & Balcazar, F. (2008). Peer-mentoring and disability: Current applications and future directions. In T. Kroll, *Focus on disability: Trends in research and application* (pp. 89–108). Nova Science Publishers.

Hernandez, B. (2005). A voice in the chorus: Perspectives of young men of color on their disabilities, identities, and peer-mentors. *Disability & Society*, *20*(2), 117–133. https://doi.org/10.1080/09687590500059051

Hoffmann, D. D., Sundby, J., Biering-Sørensen, F., & Kasch, H. (2019). Implementing volunteer peer mentoring as a supplement to professional efforts in primary rehabilitation of persons with spinal cord injury. *Spinal Cord*, *57*(10), 881-889. doi:10.1038/s41393-019-0294-0.

Imperial, M. T. (2021). Implementation structures: The use of top-down and bottom-up approaches to policy implementation. *Oxford Research Encyclopedia of Politics*, https://doi.org/10.1093/acrefore/9780190228637.013.1750

Jones, M. L., Gassaway, J., & Sweatman, W. M. (2021). Peer mentoring reduces unplanned re-admissions and improves self-efficacy following inpatient rehabilitation for individuals with spinal cord injury. *The Journal of Spinal Cord Medicine*, *44*(3), 383–391. https://doi.org/10.1080/10790268.2019.1645407

Juckett, L. A., Wengerd, L. R., Faieta, J., & Griffin, C. E. (2019). Evidence-based practice implementation in stroke rehabilitation: A scoping review of barriers and facilitators. *The American Journal of Occupational Therapy*, *74*(1), 7401205050p1-7401205050p14. *https://doi.org/10.5014/ajot.2020.035485*

Kirk, M. A., Kelley, C., Yankey, N., Birken, S. A., Abadie, B., & Damschroder, L. (2015). A systematic review of the use of the Consolidated Framework for Implementation Research. *Implementation Science*, *11*(1), 72. https://doi.org/10.1186/s13012-016-0437-z

Lamontagne, M.-E., Best, K. L., Clarke, T., Dumont, F. S., & Noreau, L. (2019). Implementation evaluation of an online peer-mentor training program for individuals with spinal cord injury. *Topics in Spinal Cord Injury Rehabilitation*, *25*(4), 303–315. https://doi.org/10.1310/sci19-00002

Li, S., Cao, M., & Zhu, X. (2019). Evidence-based practice: Knowledge, attitudes, implementation, facilitators, and barriers among community nurses—systematic review. *Medicine*, *98*(39), e17209. https://doi.org/10.1097/MD.0000000000017209

McKay, R. C., Giroux, E. E., Baxter, K. L., Casemore, S., Clarke, T. Y., McBride, C. B., Sweet, S. N., & Gainforth, H. L. (2022). Investigating the peer mentor-mentee relationship: Characterizing peer mentorship conversations between people with spinal cord injury. *Disability and Rehabilitation*, *45*(6), 962–973. https://doi.org/10.1080/09638288.2022.2046184

Moncion, K., Biasin, L., Jagroop, D., Bayley, M., Danells, C., Mansfield, A., Salbach, N. M., Inness, E., & Tang, A. (2020). Barriers and facilitators to aerobic exercise implementation in stroke rehabilitation: A scoping review. *Journal of Neurologic Physical Therapy*, *44*(3), 179–187. https://doi.org/10.1097/NPT.0000000000000318

Newman, S. D., Toatley, S., Rodgers, M. D., Qanungo, S., Mueller, M., Denny, B., & Rodriguez, A. (2023). Feasibility of a community-based, online, peer-supported spinal cord injury self-management intervention: Protocol for a pilot wait-listed randomized trial. *JMIR Research Protocols*, *12*, 42688. https://doi.org/10.2196/42688

Post, M. W. M., Nooijen, C. F., Postma, K., Dekkers, J., Penninx, F., van den Berg-Emons, R. J. G., & Stam, H. J. (2017). People with spinal cord injury in the Netherlands. *American*

Journal of Physical Medicine & Rehabilitation, *96*(2), S93–S95. https://doi.org/10.1097/PHM.0000000000000619

Rocchi, M.A., Shi, Z., Shaw, R.B., McBride, C.B., & Sweet, S.N. (2022) Identifying the outcomes of participating in peer mentorship for adults living with spinal cord injury: A qualitative meta-synthesis. *Psychology & Health, 37*(4), 523–544. https://doi.org/10.1080/08870446.2021.1890729

Shaw, R. B., Giroux, E. E., Gainforth, H. L., McBride, C. B., Vierimaa, M., & Martin Ginis, K. A. (2022). Investigating the influence of interaction modality on the communication patterns of spinal cord injury peer mentors. *Patient Education and Counseling*, *105*(5), 1229–1236. https://doi.org/10.1016/j.pec.2021.09.008

Shaw, R.B., Sweet, S.N., McBride, C.B., Adair, W.K. & Martin Ginis, K.A. (2019). Operationalizing the reach, effectiveness, adoption, implementation, maintenance (RE-AIM) framework to evaluate the collective impact of autonomous community programs that promote health and well-being. *BMC Public Health*, *19*(1), 803. https://doi.org/10.1186/s12889-019-7131-4

Sherman, J. E., DeVinney, D. J., & Sperling, K. B. (2004). Social support and adjustment after spinal cord injury: Influence of past peer-mentoring experiences and current live-in partner. *Rehabilitation Psychology, 49*(2), 140–149. https://doi.org/10.1037/0090-5550.49.2.140

Shi, Z., Comeau, J., Bloom, G. A., Gainforth, H., Thomas, A., & Sweet, S. N. (2023). Delivery of a community-based peer mentorship program for people with spinal cord injury at a rehabilitation center. *Frontiers Rehabilitation Science, 4,* 1296505. https://doi.org/10.3389/fresc.2023.1296505

Shi, Z., Koch, J., Schaefer, L., Li, Q., Wang, L., & Sweet, S. N. (2020). Exploring how Chinese adults living with spinal cord injury viewed the prospect of inpatient peer support programs within a hospital-based rehabilitation setting. *Spinal Cord*, *58*(11), 1206-1215. https://doi.org/10.1038/s41393-020-0490-y

Sweet, S. N., Hennig, L., Pastore, O. L., Hawley, S., Clarke, T. Y., Flaro, H., Schaefer, L., & Gainforth, H. L. (2021). Understanding peer mentorship programs delivered by Canadian SCI community-based organizations: Perspectives on mentors and organizational considerations. *Spinal Cord*, *59*(12), 1285–1293. https://doi.org/10.1038/s41393-021-00721-6

Torp, S., & Bergheim, L. T. J. (2023). Working environment, work engagement and mental health problems among occupational and physical therapists. *Scandinavian Journal of Occupational Therapy*, *30*(4), 505–519. https://doi.org/10.1080/11038128.2022.2154261

Tracy, S. J. (2010). Qualitative quality: Eight "big-tent" criteria for excellent qualitative research. *Qualitative inquiry*, *16*(10), 837-851. https://doi.org/10.1177/1077800410383121

Weatherson, K. A., McKay, R., Gainforth, H. L. & Jung, M. E. (2017). Barriers and facilitators to the implementation of a school-based physical activity policy in Canada: Application of the theoretical domains framework. *BMC Public Health*, *17*(1), 835. https://doi.org/10.1186/s12889-017-4846-y

Yin, R. K. (2017). *Case study research and applications: Design and methods* (6th ed.). Sage.

Youn, S., Geismar, H. N., & Pinedo, M. (2022). Planning and scheduling in healthcare for better care coordination: Current understanding, trending topics, and future opportunities.

Production and Operations Management, *31*(12), 4407–4423. https://doi.org/10.1111/poms.13867

Zanca, J. M., Dijkers, M. P., Hsieh, C.-H., Heinemann, A. W., Horn, S. D., Smout, R. J., & Backus, D. (2013). Group therapy utilization in inpatient spinal cord injury rehabilitation. *Archives of Physical Medicine and Rehabilitation*, *94*(Suppl. 4), S145–S153. https://doi.org/10.1016/j.apmr.2012.11.049

Zhao, J., Bai, W., Zhang, Q., Su, Y., Wang, J., Du, X., Zhou, Y., Kong, C., Qing, Y., Gong, S., Meng, M., Wei, C., Li, D., Wu, J., Li, X., Chen, W., & Hu, J. (2022). Evidence-based practice implementation in healthcare in China: A living scoping review. *The Lancet Regional Health - Western Pacific*, *20*, 10035. https://doi.org/10.1016/j.lanwpc.2021.100355

Bridging Text

Chapter three is an original manuscript that identified the barriers, facilitators, and possible solutions to implement prospective SCI peer mentorship programs at two rehabilitation hospitals. In this Chapter, we focused on the pre-implementation phase and gathered the health professionals' perceptions on what might happen in planning and developing a SCI peer mentorship program. We still lacked an understanding of what processes had already taken place *during* the implementation of a SCI peer mentorship program. Therefore, we decided to look at an existing, long-standing peer mentorship program delivered by a community-based organization at a rehabilitation center and investigate the barriers and facilitators within this program in Chapter four. In addition, since health professionals' engagement was identified as a key facilitator in Chapter three, we aimed to explore how the health professionals and the SCI mentors collaborated within the ongoing peer mentorship program in Chapter four.

Chapter Four: Delivery of a community-based peer mentorship program for people with spinal cord injury at a rehabilitation center

Zhiyang Shi[1,2], Jacques Comeau[1], Gordon A. Bloom[1,2], Heather L. Gainforth[3,4], Aliki Thomas[1,2], & Shane N. Sweet[1,2]

McGill University[1]

Centre for Interdisciplinary Rehabilitation Research in Metropolitan Montreal[2]

University of British Columbia Okanagan[3]

International Collaboration on Repair Discoveries[4]

(Published)

Shi, Z., Comeau, J., Bloom, G. A., Gainforth, H., Thomas, A., & Sweet, S. N. (2023). Delivery of a community-based peer mentorship program for people with spinal cord injury at a rehabilitation center. *Frontiers in Rehabilitation Sciences, 4*, 1296505. https://doi.org/10.3389/fresc.2023.1296505

Abstract

Introduction: Community-based spinal cord injury (SCI) organizations deliver peer mentorship programs in rehabilitation settings. Little is known on how these programs are delivered through the collaboration between community-based SCI organizations and rehabilitation institutions. This study aimed to identify barriers, facilitators, and collaboration processes within a SCI peer mentorship program provided by a community-based organization at a rehabilitation center. **Methods:** A qualitative case study design was applied. Seven participants were recruited, including two mentees, two mentors, one program director of the community-based SCI organization, and two healthcare professionals of the rehabilitation center. Each participant completed a one-on-one interview. Data were analyzed inductively and deductively based on the Consolidated Framework for Implementation Research (CFIR). **Results**: Ten factors were identified to influence the delivery of the peer mentorship program, including nine CFIR constructs. Successful delivery of the program required strong, collaborative inter-professional relationships between health professionals and community organizational staff (e.g., peer mentors) as facilitators; whereas potential cost, minimal patient needs, and limited mentor resources were found to be barriers. Engaging health professionals by initiating communications, reflecting and evaluating the program collectively with health professionals were important collaboration processes for the community-based organization to maintain effective partnership with the rehabilitation center. **Discussion:** The collaboration processes and strategies to addressing/leveraging the barriers and facilitators may inform evidence-based practice to establish and optimize the delivery of SCI peer mentorship programs in various rehabilitation settings.

Keywords: Spinal Cord Injury, Rehabilitation, Community Services, Peer Support, Qualitative Research

Delivery of a community-based peer mentorship program for people with spinal cord injury at a rehabilitation center

Introduction

Spinal cord injury (SCI) refers to any damage or lesion to the spinal cord that results in autonomic, motor, and sensory impairments and lifelong disability. After an SCI, people often begin a rehabilitation process in which they experience significant adjustment to life (Noreau et al., 2014). One strategy that has been utilized to support the rehabilitation and community re-integration for people with SCI is peer mentorship (Gassaway et al., 2018). Peer mentorship is a form of peer interaction aiming to help individuals who share similar lived experiences adapt and thrive (Barclay & Hilton; 2022; Rocchi et al., 2022). In Canada, provincial community-based SCI organizations collaborate with more than 41 hospitals and rehabilitation centers to make peer mentorship available for many Canadians with SCI (Shaw et al., 2019).

Delivering peer mentorship programs in rehabilitation settings often relies on collaborations between community-based SCI organizations and rehabilitation institutions (Sweet et al., 2021a). Peer mentorship literature has mostly gathered insights from mentors, mentees, family members, and community organizational staff to understand characteristics and outcomes of peer mentorship programs (Shaw et al., 2019; Sweet et al., 2021b). However, it remains unclear how peer mentorship programs are delivered through collaborations between community-based SCI organizations and rehabilitation institutions. Additionally, the role of health professionals and their relationships with community organizational staff (e.g., peer mentors) within peer mentorship programs largely remains unknown. Without this knowledge, it is difficult to optimize the implementation of SCI peer mentorship programs within rehabilitation contexts.

Some international studies examined the integration of SCI peer mentorship programs into rehabilitation settings (Cabigon et al., 2019; Gassaway et al., 2017; Haas et al., 2013; Hoffmann et al., 2019; Jones et al., 2021; Ljungberg et al., 2011; Veith et al., 2006). For one, Cabigon et al. (2019) investigated the inter-professional collaboration between peer mentors and health professionals in delivering SCI bowel education and demonstrated the feasibility of the program at an American rehabilitation center. In addition, a Danish study described the process of health professionals recruiting and training peer mentors prior to the delivery of a SCI peer mentorship program (Hoffmann et al., 2019). These two studies highlighted that the collaborative relationship between SCI peer mentors and health professionals was important to the programs. However, they focused on the development phase of the peer mentorship programs without investigating how SCI peer mentors and healthcare professionals collaborate to maintain SCI peer mentorship programs.

Theoretical frameworks in implementation science may help us understand the collaboration between rehabilitation institutions and community-based SCI organizations in delivering peer mentorship programs (Esmail et al., 2020). One framework that was specifically designed for investigating the implementation and delivery of a program/service is the Consolidated Framework for Implementation Research (CFIR; Damschroder et al., 2009). The CFIR organizes 39 factors (e.g., networks and communications) that influence the implementation of a program into five domains (e.g., intervention characteristics). The CFIR has been used to investigate programs/services for people with SCI (Lamontagne et al., 2019) and allowed the researchers to examine various aspects of the programs, including relationships among the personnel involved (Esmail et al., 2020; Stevens et al., 2022).

The purpose of this study was to identify barriers, facilitators, and collaboration processes within a SCI peer mentorship program provided by a community-based organization at a rehabilitation center. Framed around the CFIR, three main research questions were: 1) how was the peer mentorship program delivered through the collaborations between the community-based organization and the rehabilitation center; 2) what were the barriers and facilitators to the delivery of the program; and 3) what were the inter-professional relationships between the community organizational staff (e.g., SCI peer mentors) and the rehabilitation professionals?

Methods

Design

We applied a qualitative case study design (Baxter & Jack, 2008), which allowed us to collect contextual information on the program and investigate how the peer mentorship program was delivered (Baxter & Jack, 2008; Yin, 2003). We situated this study within a post-positivist paradigm (Smith et al., 2012) and assumed that an external reality existed independent of our knowledge of it (i.e., modified realist ontology). Our research team consists of one retired SCI peer mentor (JC) and five researchers (AT, GB, HG, SS, and ZS) who self-identify as being non-disabled. AT, GB, HG, and SS are associate/full university professors. ZS is a senior doctoral candidate with seven years of research experience, primarily using qualitative methodologies. AT and HG have expertise in the field of implementation science/knowledge translation within the rehabilitation and disability contexts. GB, HG, SS, and ZS conducted multiple research studies on peer mentorship in various contexts, such as parasport and SCI. HG, SS, and ZS have a research focus on social participation and well-being promotion among individuals with SCI. GB is an expert in qualitative research who assisted JC, SS and ZS to critically think about the data. This combination of the diverse expertise resonates with the focus and design of the current

study. Our different knowledge backgrounds and research experiences inescapably shaped how we formulated the research questions and interpreted different aspects of the SCI peer mentorship program (i.e., subjectivist epistemology; Smith et al., 2012).

Setting

We identified a local community-based SCI organization that offers peer mentorship programs in both the community and rehabilitation settings, including a rehabilitation center that provides services to individuals with SCI. There is no cost to patients in the rehabilitation center to participate in the peer mentorship program. The community-based organizational staff, including SCI peer mentors, are on-site at the rehabilitation center and work directly with a multidisciplinary healthcare team including occupational therapists and physical therapists. The peer mentorship is mentee-focused in that topics of the conversations can vary depending on mentees' specific needs. Peer mentorship is delivered through both (a) informal, unstructured conversations between mentors and mentees, which can happen at bedside or common areas (e.g., cafeteria) at the rehabilitation center and (b) formal, structured conversations either by information sessions delivered by mentors and rehabilitation staff or individuals, topic-focused discussion with a mentee. The mentorship relationship can also continue after in-patient rehabilitation process as mentors also provide mentorship to people with SCI living in the community. We chose to look at this program because it is recognized as long-standing and successful, with more than 40 years of continuous delivery.

Participants and Data Collection

We recruited a purposive sample of seven participants from the community-based SCI organization and the rehabilitation center. Participants were individuals involved in the peer mentorship program with different roles, including two mentees, two mentors, one program

director of the community-based SCI organization, and two healthcare professionals of the rehabilitation center (one social worker and one kinesiologist). The sample size aligned with the qualitative case study design (Bradbury-Jones et al., 2017). All seven participants were adults, had no cognitive impairments, and were able to communicate in English or French. Eligible healthcare professionals must have experience of interacting with a SCI peer mentor(s) during the last two years. Eligible peer mentees and mentors must have engaged in the peer mentorship program at the rehabilitation center during the last two years. This study was approved by the university research ethics board.

We provided the information on this study (e.g., purpose, research questions, procedures) and obtained participants' consent using an online consent form embedded in emails. Each participant completed a virtual, one-on-one, audio-recorded interview with the first author (ZS) using a semi-structured interview guide. The interview guide included questions selected from the CFIR interview guide tool (cfirguide.org/) and the questions were adapted to the different roles of the participants (Appendix 4.A). For example, the question "How do you feel about the intervention being used in your setting?" (CFIR construct: Knowledge and beliefs about the intervention) was adapted to "How do you feel about the peer mentorship program at the rehabilitation center?". Each interview was planned to be completed within one hour.

Data Analysis

All seven interviews were transcribed verbatim, resulting in 128 pages of text. Transcripts were analyzed using a two-step (i.e., deductive and inductive) analytical approach (Weatherson et al., 2017). Deductively, participants' quotes that were found to be relevant to any of the 39 CFIR constructs were coded with the constructs names. Inductively, data that did not align with CFIR constructs but were relevant to our research questions were coded with a non-

CFIR construct. To represent broader ideas identified within the data, all deductive and inductive constructs were examined and organized into overarching themes. The first author (ZS) conducted the deductive and inductive coding using Nvivo and had multiple discussions with the co-authors to develop the themes. Specifically, ZS coded and extracted the data relevant to the research questions using CFIR. The development of themes was an iterative process, in which ZS had multiple meetings with JC to identify the initial themes. These initial themes were then critically examined with SS, resulting in modification of the initial themes. Next, GB helped re-organize the themes and enhance the clarity in reporting the results as a critical friend. This two-step approach allowed us to identify elements relevant to the peer mentorship program based on CFIR, while also exploring information beyond CFIR constructs. Because participants had different roles in the program, interview data were first analyzed within the same type of participants (e.g., mentees) and then across the different types of the participants (e.g., mentees vs. mentors) to identify common themes (Baxter & Jack, 2008).

Study Quality

We ensured the quality of this study following the eight universal criteria named by Tracy (2010), including 1) worthy topic: by clearly defining the research purpose and highlighting its relevancy to the SCI population; 2) rich rigor: by adopting the CFIR to guide the data collection and analysis; 3) sincerity: by engaging critical friends in the analysis and recognizing our subjective values influencing the interpretations; 4) credibility: by spending time building rapport with participants during the interviews and involving the author with lived experience (JC) in the data analysis. JC lives with SCI and had worked as a SCI peer mentor for over ten years. JC's input ensured the themes identified were relevant to the delivery of the peer mentorship program from their perspective; 5) resonance: by incorporating participants' quotes

into the results; 6) significant contribution: by highlighting the study implications to the SCI literature and rehabilitation practice; 7) ethics: by following the procedures approved by the university ethics board; and 8) meaningful coherence: by applying research methods aligning with the qualitative case study design (Smith & McGannon, 2018; Smith et al., 2014). A COnsolidated criteria for REporting Qualitative Research (COREQ) checklist was attached (Tong et al., 2007; Appendix 4.B).

Results

The data were organized into three overarching themes: program characteristics, local setting and individuals, and inter-professional collaboration. These overarching themes included 10 of 39 CFIR constructs identified in the deductive analysis and one inductive, non-CFIR construct (marked with *). Figure 4.1 summarized the organization of the overarching themes and constructs. We adapted the names of some CFIR constructs (e.g., cost to mentees) to ensure fit in the local context and the delivery of the peer mentorship program. Participant quotes were also presented in the results.

Program Characteristics

Adaptability, cost, and relative advantage were three characteristics of the peer mentorship program that were identified to influence the delivery of the program at the rehabilitation center.

Having a variety of methods to deliver the peer mentorship program enables the community-based organization and the rehabilitation center to adapt, tailor, refine, or reinvent the program as needed [Adaptability]. The rehabilitation center and the community-based organization typically deliver the program by creating an environment where mentors and patients interact through informal conversations. However, they also offer mentees a regular

magazine, group-based coffee meetings, and a series of courses on SCI, which allows mentees to interact with peer mentorship resources that meet their needs. Furthermore, the community-based organization and the rehabilitation center made adaptations to the program during the COVID-19 pandemic by coordinating formal in-person, one-on-one meetings between mentors and mentees to maintain the delivery of the program.

"Normally we were able to do a lot of activities in-house, at the [rehabilitation center], but we couldn't do any for a long time [during the pandemic]. The patients were [restricted] in their rooms… That's when we realized that it was so complicated to meet with the patients. We asked the nurse on the second floor to help us plan formal meetings in a local area with each patient with spinal cord injury. As I said, if we don't do that, I would say we're going to lose so many people, (and) we can't do that. So, it's the way we adapted to the new situation." —Julie (program director of the community-based organization)

Despite the fact that the current peer mentorship program is free for patients with SCI at the rehabilitation center, any potential monetary cost to access the program can become a possible barrier for patients with SCI to participate in the program [Cost to mentee], as Jack (mentee) said:

"You can get all the information on the Internet. Anyways, you know? … I can read all over the Internet and there's forums, you know, there's Christopher Reeves Foundation. There's all kinds of stuff where I can talk to many experienced paraplegics on the Internet. Yeah, so for me, there's no point in paying for [peer mentorship] at all… If they were to charge people for their services, I would not be… I'd rather pay for medical service."

Finally, the peer mentorship program was found to be a valuable addition to regular rehabilitation services [Relative advantage]. The health professionals noted the peer mentors

were able to provide disability-specific tips and helpful suggestions based on their lived experience with SCI. These suggestions helped the health professionals supplement their medical and therapeutic recommendations. As Anna (social worker) noted:

"We are professionals, we didn't go through that [living with SCI]. They [mentors] really lived the situation, because some patients will say [to us] 'you didn't live it' and they are right, we are here to accompany, we didn't really live it, whereas the mentors have really lived the situations."

Local Setting and Individuals

The delivery of the peer mentorship program related to three CFIR constructs, focusing on patients' needs, a positive organizational culture within the local rehabilitation center, and health professionals' adequate knowledge and beliefs about peer mentorship.

A strong need for peer mentorship, identified among the SCI patient clientele at the rehabilitation center, appears to facilitate the delivery of the program. Because the community-based organization partners with multiple hospitals and rehabilitation centers in the region, it tends to allocate mentor resources and prioritize institutions with a larger SCI clientele and/or a greater patient need for the peer mentorship program [Patient Needs and Resources]:

"In most settings, they don't have a lot of people with SCI there. And there are no centers across our province other than the [rehabilitation center] where patients are onsite with a [SCI] group… We know that there's always 20 patients, so we have people in house all the time because we're going to be crossing and seeing people at the center where you go in once or twice a week. You can't hire somebody who's going to work two hours a week or three hours a week and say, 'Be there on Tuesday from three to four and Thursday from ten to eleven.' In those situations, we tend to typically offer services more personalized where somebody will talk over

the phone, you know, when you're interested in talking. But having somebody on site is not always feasible." — Jean (mentor)

Second, an organizational culture that values new changes and is willing to adapt to changes at the rehabilitation center was another facilitator for the delivery of the peer mentorship program [Culture]. In the current peer mentorship program, the program director of the community-based organization had experienced different organizational cultures within the rehabilitation center by working with health professionals over many years. She highlighted the impact of a recent change in staff that created a more positive organizational culture and resulted in improved outcomes of the peer mentorship program.

"People who retired and the new people who came in found that there was a culture change. It's really healthier. We're giving a very positive input to the patients."—Julie (program director of the community-based organization)

Third, the positive attitudes toward and the value placed on the peer mentorship program by the health professionals were identified as key facilitators to the delivery of the program [Knowledge and Beliefs about the Intervention]. The ongoing interactions with the mentors helped the health professionals expand their knowledge on SCI peer mentorship and thus develop a strong commitment to collaborating with the mentors.

"We learn a lot from their [mentors] experience…If we need to realign our thinking, our vision, it's always a question we ask [mentors], 'what you had wanted to change in rehabilitation, what we could have done better, and how you would have liked it if we had talked about [certain] things.' To have this feedback from them [mentors] is very important for us to be able to align our work and to be in the right direction." —Nada (kinesiologist)

Interprofessional Collaboration

The peer mentorship program requires a cohesive interprofessional collaboration that consists of engaging the health professionals in the program, as well as evaluating and reflecting on the delivery of the program. Interprofessional collaboration can also be built by establishing strong communication channels and clear boundaries between the health professionals and the community-based organizational staff, particularly the mentors.

One mechanism that appeared to build inter-professional collaboration is having quality social networks and communications between the mentors and the health professionals [Networks & Communications]. In this case, the peer mentors have an office at the rehabilitation center and share workspace with the health professionals. This proximity creates opportunities for frequent, informal communications between the health professionals and the mentors, while facilitating resolution of misunderstandings around patient care:

"The mentors are on the same floor as us, they are practically in our offices so we get to see them. It's [the communication] quick, it's easy, it's efficient. They are also often around the floor for a variety of reasons, so we can interact with them as they pass… Sometimes it [the communication] can be informal, like in the hallway and we bump into a member of [community-based organization]. Sometimes something happens where they [mentors] might have made a suggestion, such as about an adjustment or type of wheelchair, but as we know the client, and our recommendation might be a reason that's not so obvious to someone else, so we might have to talk about why we suggested what we did versus what they thought." —Nada (kinesiologist).

Another mechanism that the community-based organization strengthens the interprofessional collaboration is attracting and involving the health professionals in the peer

mentorship program by helping them understand mentors' roles and benefits of the peer mentorship program [Engaging]:

"They [health professionals] have to know the [SCI] organization well, the [healthcare] team has to understand the importance of that [mentorship]. It must be well explained to the teams that are giving the care: what is the role of a peer mentor and what they bring to people. You [health professionals] really must understand that as a base. Once they understand that, they're going to be more motivated to put in place a service like [peer mentorship], and they're going to be able to see how it can help them in their interventions." —Julie (program director of the community-based organization)

Consistent evaluation and reflection on the progress and quality of the peer mentorship program was another important process of the interprofessional collaboration [Reflecting and Evaluating]. Within the current program, the program director of the community-based organization has been taking an integral role in tracking the progress and quality of the peer mentorship program. However, a team approach through collaborating with the health professionals and the mentors is needed due to emerging challenges in delivering the program. As these two quotes below demonstrated,

"I do all the budgeting, I hire the people, all the work of a manager… I make sure that they [mentors] are present at the [rehabilitation center]. I make sure that as much as possible we meet all the people who come to the [rehabilitation center], obviously those with an SCI… Of course, when there are new employees, new senior integration mentors, I make sure that the [rehabilitation center's] management is aware of this, that they [the mentors] have training… We are challenged in different ways. We arrive and sometimes the clientele is really older so we

have to adapt our intervention a little bit, the activities we offer to succeed in getting people interested." —Julie (program director of the community-based organization)

"I think we [the health professionals and the community-based organizational staff] could have even more discussions [on letting patients participate in the peer mentorship program]. I think sometimes there might be disagreement between us [the health professionals] and the mentors, [because] in the rehabilitation environment where we [the health professionals] have to be a little more careful with new spinal cord injuries [patients]. Sometimes [the health professionals believe] they are not ready to be sent to an activity of [the community-based organization] because they may not have someone to help them transfer." —Nada (kinesiologist)

While the interprofessional collaboration is key to the peer mentorship program, maintaining professional boundaries between the health professionals and the community-based organizational staff is also important [Professional Boundaries*]. As Betty (mentor) mentioned, "We are not registered in their rehabilitation program. We are completely independent. Yes, we collaborate with the health specialists, but we remain an independent entity". In this case, the rehabilitation center and the community-based organization have an agreement that explicitly outlines the boundaries regarding the mentors' access to patient confidential information. Although the agreement does not include all aspects of the mentors' responsibilities, it helps the health professionals and the mentors understand and adhere to their roles in patient care:

"We [mentors] must not interfere with the role of social workers in the rehabilitation center. For example, an occupational therapist should not feel challenged in what she does in comparison to a senior mentor in the center. If this happens, we have to resolve the situation. Everyone has to know their place. So that's really important… We never directly give the patient

the clinical judgment, that's being a professional." —Julie (program director of the community-based organization)

Although the professional boundaries were clear to the mentors and the health professionals, these boundaries might be blurry for patients. Patients may expect clinical guidance from mentors and can potentially create difficult situations during their interactions with mentors and/or health professionals, as Frank (mentee) said: "I was putting them [mentors and health professionals] together. They all did the same thing. That is to say, answer my questions and enlighten me on the various aspects of reduced mobility. On both sides, I would say that they did a lot on the same job. For me the plus side is that it [the mentor] brings sports into our exchanges." Patients' confusion in these roles might impede their participation in the peer mentorship program because they might not perceive the benefits of engaging with mentors.

Discussion

The purpose of this study was to identify barriers and facilitators to the delivery of the peer mentorship program provided by a community-based SCI organization at a rehabilitation center and characterize the collaboration processes between the community organizational staff and the health professionals. We gathered multiple perspectives from the individuals directly involved in the program, including peer mentorship program director, peer mentors, mentees, and health professionals. In addition to the barriers, facilitators, and collaboration processes identified, our study highlighted multiple strategies that the rehabilitation center and the community-based organization have taken to address/leverage these barriers/facilitators. The strategies may inform collaborative processes needed to establish a partnership between rehabilitation institutions and community-based organizations as per this peer mentorship program.

In alignment with previous studies using the CFIR in a healthcare context (Chan et al., 2021; Kirk et al., 2016), the barriers and facilitators identified in this study were found to influence the delivery of the peer mentorship program, including adaptability, cost, relative advantage, knowledge and beliefs about the intervention, culture, networks and communication, patient needs and resources, engaging, and reflecting and evaluating. The constructs identified covered all five CFIR domains and demonstrated a full breadth of the results. For example, the collaborative networks and communication between the mentors and the health professionals were found to be key for the program, which aligns with past research as being one of the most frequently used CFIR constructs (Kirk et al., 2016). Our results enrich the literature by identifying how peer mentors and health professionals strengthen their network and communication. For instance, sharing workspace, having informal conversations, and maintaining clear professional boundaries were strategies used by the mentors and the health professionals within the current peer mentorship program. Future peer mentorship programs should consider these collaboration and networking strategies to ensure the success of program implementation.

Peer mentorship programs within rehabilitation settings often target specific health outcomes for people with SCI (e.g., self-efficacy; Gassaway et al., 2017), while the program in our study had an objective of promoting broader outcomes such as social and community re-integration. The community-based organization's objective closely aligns with the health professionals' goal of facilitating patients' transition from rehabilitation to community. This alignment has contributed to the consistent engagement in the program for both organizations. Creating a shared vision is important for organizations to work together, whereas it is often challenging (Willis et al., 2016). Carrying out group activities that can encourage staff members

to openly share their perspectives may help organizations develop a shared vision (Thoms, 1997). These group activities may also allow staff from community-based organizations and rehabilitation institutions to share decision-making in defining goals and structure of the peer mentorship program prior to its delivery.

Communication among staff members tends to be an important aspect to successful implementation of services/programs across healthcare contexts (Eastment et al., 2022; Simpson et al., 2022). Similarly, the "networks & communication" construct was identified as a facilitator in our study as the relationship between the mentors and the health professionals was highly collaborative and interactive. Other rehabilitation institutions might experience more challenges in maintaining constant team communication, particularly for those with a larger team or a culture with low expectations for communication (O'Daniel & Rosenstein, 2008). Within the current program, an office space for mentors embedded into the rehabilitation center enhances communication between mentors and rehabilitation staff. When a physical space is not possible, leaders of community-based organizations and rehabilitation institutions should foster communication among staff members by encouraging team discussions, forming a coalition/learning group, and/or identifying an opinion leader who can oversee the implementation (Waltz et al., 2019).

Interprofessional collaboration has received growing attention in healthcare. In our study, "networks and communication" and "professional boundaries" were the two largest constructs identified in terms of data volume. The interprofessional relationship between the mentors and the health professionals was interpreted as a key aspect of program implementation and maintenance. In alignment with previous research, the interprofessional collaboration between the mentors and the health professionals has resulted in multiple benefits, including personal and

professional growth, as well as good work efficiency (Bosch & Mansell, 2015; Chang et al., 2009). Additionally, because the community-based organization prioritizes delivering peer mentorship in-person, the health professionals were able to help the mentors build connections with patients and create mentor-mentee meeting opportunities. Therefore, community-based organizations and rehabilitation institutions should enhance their staff members' skills in interprofessional collaboration in order to strengthen collaborations at an organizational level, including how to maintain professional boundaries (Cameron, 2011; Pecukonis et al., 2008). Although establishing and maintaining professional boundaries is often challenging in healthcare practice (Cameron, 2011; MacNaughton et al., 2013), the roles of peer mentors and health professionals appeared to be well defined by the formal agreement within the current peer mentorship program. Clear boundaries can ensure the quality of mentor-mentee relationships and mentors' well-being in a long term (Alexander et al., 2022; Sweet et al., 2021a).

Another important collaboration process that can be challenging for community-based organizations was engaging and building buy-in among health professionals prior to the program delivery. Frequent staff change can hinder the process of engaging health professionals in the peer mentorship program (Zhou et al., 2022). To address these barriers, community-based organizations can identify a local 'champion'/'opinion leader' who can influence health professionals' attitudes and beliefs (Gaid et al., 2021; Pomare et al., 2019). Furthermore, program evaluation over time is deemed to be necessary for delivery sustainability. For programs in the early phase, assessment can focus on appropriateness, feasibility, and accessibility (Proctor et al., 2011). For long-standing programs, tracking the impacts on people with SCI may be a priority (Sweet et al., 2021b).

Limitations

First, we were only able to recruit two health professionals from the rehabilitation center during the COVID-19 pandemic, although there might be multiple other health professionals who were directly or indirectly involved in the peer mentorship program. The two recruited health professionals might have a favorable opinion about the peer mentorship program as they consented to participate in this study. However, obtaining the perspectives from the peer mentorship program coordinator, the mentors, and the mentees still enabled us to capture a broad picture of individuals actively involved in the program. Another limitation was that we did not apply the updated version of CFIR (Damschroder et al., 2022) because we collected and analyzed the data prior to the publication. However, our application of the original version of CFIR was found to be appropriate given that the facilitators, barriers, and collaboration processes were identified based on the original CFIR. Initial coding was conducted by the first author (ZS) individually. Engaging co-authors to develop and critique the themes was conducted to strengthen to rigor of our analyses.

Conclusion

Using the CFIR to guide the data collection and analysis, we identified multiple barriers, facilitators, and collaboration processes to delivering the peer mentorship program within the local rehabilitation center. Our results may help other community-based SCI organizations and rehabilitation institutions develop, maintain, and optimize peer mentorship programs in various rehabilitation settings. Community-based SCI organizations and rehabilitation institutions may enhance interprofessional collaborations between organizational staff (e.g., peer mentors) and health professionals by creating shared workspace, facilitating informal conversations, and establishing professional boundaries.

References

Alexander, D., Caron, J. G., Comeau, J., & Sweet, S. N. (2022). An exploration of the roles and experiences of SCI peer mentors using creative non-fiction. *Disability and Rehabilitation*, *44*(22), 6824–6832. doi:10.1080/09638288.2021.1977395

Barclay, L., & Hilton, G. (2022). Spinal cord injury rehabilitation: Linking service delivery and community integration. *Diagnosis and Treatment of Spinal Cord Injury*, Academic Press, 501-512. doi:10.1016/B978-0-12-822498-4.00039-7

Baxter, P., & Jack, S. (2008). Qualitative case study methodology: Study design and implementation for novice researchers. *The Qualitative Report*, *13*(4), 544–559. doi: 10.46743/2160-3715/2008.1573

Bosch, B., & Mansell, H. (2015). Interprofessional collaboration in health care. *Canadian Pharmacists Journal : CPJ*, *148*(4), 176–179. doi:10.1177/1715163515588106

Bradbury-Jones, C., Breckenridge, J., Clark, M. T., Herber, O. R., Wagstaff, C., & Taylor, J. (2017). The state of qualitative research in health and social science literature: A focused mapping review and synthesis. *International Journal of Social Research Methodology*, *20*(6), 627–645. doi: 10.1080/13645579.2016.1270583

Cabigon, R. D., Wojciechowski, E., Rosen, L., Miller, D., Mix, C., & Chen, D. (2019). Interprofessional collaboration and peer mentors for bowel education in spinal cord injury: A case consultation. *Rehabilitation Nursing: The Official Journal of the Association of Rehabilitation Nurses*, *44*(2), 123–127. doi: 10.1097/rnj.0000000000000123

Cameron, A. (2011). Impermeable boundaries? Developments in professional and inter-professional practice. *Journal of Interprofessional Care, 25*(1), 53–58. doi:10.3109/13561820.2010.488766

Chan, P. S., Fang, Y., Wong, M. C., Huang, J., Wang, Z., & Yeoh, E. K. (2021). Using Consolidated Framework for Implementation Research to investigate facilitators and barriers of implementing alcohol screening and brief intervention among primary care health professionals: A systematic review. *Implementation Science, 16*(99), 1–40. doi:10.1186/s13012-021-01170-8

Chang, W.-Y., Ma, J.-C., Chiu, H.-T., Lin, K.-C., & Lee, P.-H. (2009). Job satisfaction and perceptions of quality of patient care, collaboration and teamwork in acute care hospitals. *Journal of Advanced Nursing, 65*(9), 1946–1955. doi:10.1111/j.1365-2648.2009.05085.x

Damschroder, L. J., Aron, D. C., Keith, R. E., Kirsh, S. R., Alexander, J. A., & Lowery, J. C. (2009). Fostering implementation of health services research findings into practice: A consolidated framework for advancing implementation science. *Implementation Science, 4*(50), 1–15. doi:10.1186/1748-5908-4-50

Damschroder, L. J., Reardon, C. M., Widerquist, M. A. O., & Lowery, J. (2022). The updated Consolidated Framework for Implementation Research based on user feedback. *Implementation Science, 17*(1), 1-16. doi:10.1186/s13012-022-01245-0

Eastment, M. C., Long, J. E., Wanje, G., Richardson, B. A., Mwaringa, E., Sherr, K., Barnabas, R. V., Mandaliya, K., Jaoko, W., & McClelland, R. S. (2022). Qualitative evaluation of the Systems Analysis and Improvement Approach as a strategy to increase HIV testing in family planning clinics using the Consolidated Framework for Implementation Research

and the Implementation Outcomes Framework. *Implementation Science Communications*, *3*(97), 1–12. doi:10.1186/s43058-022-00342-x

Esmail, R., Hanson, H. M., Holroyd-Leduc, J., Brown, S., Strifler, L., Straus, S. E., Niven, D. J., & Clement, F. M. (2020). A scoping review of full-spectrum knowledge translation theories, models, and frameworks. *Implementation Science*, *15*(11), 1–14. doi:10.1186/s13012-020-0964-5

Gaid, D., Ahmed, S., Thomas, A., & Bussières, A. (2021). Profiling knowledge brokers in the rehabilitation sector across Canada: A descriptive study. *Journal of Evaluation in Clinical Practice*, *28*(2), 303–314. doi:10.1111/jep.13621

Gassaway, J., Houlihan, B. V., Everhart Skeels, S., & Jones, M. L. (2018). Force of peer mentorship for persons with spinal cord injury. *Archives of Physical Medicine and Rehabilitation*, *99*(8), 1691–1692. doi:10.1016/j.apmr.2018.02.005

Gassaway, J., Jones, M. L., Sweatman, W. M., Hong, M., Anziano, P., & DeVault, K. (2017). Effects of Peer Mentoring on Self-Efficacy and Hospital Readmission After Inpatient Rehabilitation of Individuals With Spinal Cord Injury: A Randomized Controlled Trial. *Archives of Physical Medicine and Rehabilitation*, *98*(8), 1526-1534. doi:10.1016/j.apmr.2017.02.018

Haas, B. M., Price, L., & Freeman, J. A. (2013). Qualitative evaluation of a community peer support service for people with spinal cord injury. *Spinal Cord*, *51*(4), 295-299. doi:10.1038/sc.2012.143

Hoffmann, D. D., Sundby, J., Biering-Sørensen, F., & Kasch, H. (2019). Implementing volunteer peer mentoring as a supplement to professional efforts in primary rehabilitation of

persons with spinal cord injury. *Spinal Cord*, *57*(10), 881-889. doi:10.1038/s41393-019-0294-0.

Jones, M. L., Gassaway, J., & Sweatman, W. M. (2021). Peer mentoring reduces unplanned readmissions and improves self-efficacy following inpatient rehabilitation for individuals with spinal cord injury. *The Journal of Spinal Cord Medicine*, *44*(3), 383–391. doi:10.1080/10790268.2019.1645407

Kirk, M. A., Kelley, C., Yankey, N., Birken, S. A., Abadie, B., & Damschroder, L. (2016). A systematic review of the use of the Consolidated Framework for Implementation Research. *Implementation Science*, *11*(72), 1–13. doi:10.1186/s13012-016-0437-z

Lamontagne, M.-E., Best, K. L., Clarke, T., Dumont, F. S., & Noreau, L. (2019). Implementation evaluation of an online peer-mentor training program for individuals with spinal cord injury. *Topics in Spinal Cord Injury Rehabilitation*, *25*(4), 303–315. doi:10.1310/sci19-00002

Ljungberg, I., Kroll, T., Libin, A., & Gordon, S. (2011). Using peer mentoring for people with spinal cord injury to enhance self-efficacy beliefs and prevent medical complications. *Journal of Clinical Nursing*, *20*(3–4), 351–358. doi:10.1111/j.1365-2702.2010.03432.x

MacNaughton, K., Chreim, S., & Bourgeault, I. L. (2013). Role construction and boundaries in interprofessional primary health care teams: A qualitative study. *BMC Health Services Research*, *13*(486), 1–13. doi:10.1186/1472-6963-13-486

Noreau, L., Noonan, V. K., Cobb, J., Leblond, J., & Dumont, F. S. (2014). Spinal cord injury community survey: A national, comprehensive study to portray the lives of Canadians with spinal cord injury. *Topics in Spinal Cord Injury Rehabilitation*, *20*(4), 249–264. doi:10.1310/sci2004-249

O'Daniel, M., & Rosenstein, A. H. (2008). Professional Communication and Team Collaboration. In R. G. Hughes (Ed.), *Patient Safety and Quality: An Evidence-Based Handbook for Nurses* (Vol. 2). Agency for Healthcare Research and Quality (US). https://www.ncbi.nlm.nih.gov/books/NBK2637/?report=reader

Pecukonis, E., Doyle, O., & Bliss, D. L. (2008). Reducing barriers to interprofessional training: Promoting interprofessional cultural competence. *Journal of Interprofessional Care, 22*(4), 417–428. doi:10.1080/13561820802190442

Pomare, C., Churruca, K., Long, J. C., Ellis, L. A., & Braithwaite, J. (2019). Organisational change in hospitals: A qualitative case-study of staff perspectives. *BMC Health Services Research, 19*(840), 1–9. doi:10.1186/s12913-019-4704-y

Proctor, E., Silmere, H., Raghavan, R., Hovmand, P., Aarons, G., Bunger, A., Griffey, R., & Hensley, M. (2011). Outcomes for implementation research: Conceptual distinctions, measurement challenges, and research agenda. *Administration and Policy in Mental Health, 38*(2), 65–76. doi:10.1007/s10488-010-0319-7

Rocchi, M. A., Shi, Z., Shaw, R. B., McBride, C. B., & Sweet, S. N. (2022). Identifying the outcomes of participating in peer mentorship for adults living with spinal cord injury: A qualitative meta-synthesis. *Psychology & Health, 37*(4), 523–544. doi:10.1080/08870446.2021.1890729

Shaw, R. B., Sweet, S. N., McBride, C. B., Adair, W. K., & Martin Ginis, K. A. (2019). Operationalizing the reach, effectiveness, adoption, implementation, maintenance (RE-AIM) framework to evaluate the collective impact of autonomous community programs that promote health and well-being. *BMC Public Health, 19*(803), 1–14. doi:10.1186/s12889-019-7131-4

Simpson, M. L., Ruru, S., Oetzel, J., Meha, P., Nock, S., Holmes, K., Adams, H., Akapita, N., Clark, M., Ngaia, K., Moses, R., Reddy, R., & Hokowhitu, B. (2022). Adaptation and implementation processes of a culture-centred community-based peer-education programme for older Māori. *Implementation Science Communications*, *3*(123), 1–14. doi:10.1186/s43058-0 22-00374-3

Smith, B., & McGannon, K. R. (2018). Developing rigor in qualitative research: Problems and opportunities within sport and exercise psychology. *International Review of Sport and Exercise Psychology, 11*(1), 101-121. doi: 10.1080/1750984X.2017.1317357

Smith, B., Sparkes, A. C., & Caddick, N. (2014). Judging qualitative research. In *Research Methods in Sports Coaching* (pp. 192-201). Routledge. doi: 10.4324/9780203797549-18

Smith, B., Sparkes, A. C., Phoenix, C., & Kirkby, J. (2012). Qualitative research in physical therapy: A critical discussion on mixed-method research. *Physical Therapy Reviews*, *17*(6), 374–381. doi: 10.1179/1743288X12Y.0000000030

Stevens, B., Bueno, M., Rao, M., Almeida, C., Cotic, A., Streitenberger, L., Fleming-Carroll, B., & Breen-Reid, K. (2022). An exploratory case study investigating the implementation of a novel knowledge translation strategy in a pandemic: The pandemic practice champion. *Implementation Science Communications*, *3*(45), 1–9. doi:10.1186/s43058-022-00294-2

Sweet, S. N., Hennig, L., Pastore, O. L., Hawley, S., Clarke, T. Y., Flaro, H., Schaefer, L., & Gainforth, H. L. (2021a). Understanding peer mentorship programs delivered by Canadian SCI community-based organizations: Perspectives on mentors and organizational considerations. *Spinal Cord, 59*(12), 1285-1293. doi:10.1038/s41393-021-00721-6

Sweet, S. N., Hennig, L., Shi, Z., Clarke, T., Flaro, H., Hawley, S., Schaefer, L., & Gainforth, H. L. (2021b). Outcomes of peer mentorship for people living with spinal cord injury: Perspectives from members of Canadian community-based SCI organizations. *Spinal Cord*, *59*(12), 1301-1308. doi:10.1038/s41393-021-00725-2

Thoms, P. (1997). Creating a shared vision with a project team. *PM NETWORK*, *11*, 33-36.

Tong, A., Sainsbury, P., & Craig, J. (2007). Consolidated Criteria for Reporting Qualitative Research (COREQ): A 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*, *19*(6), 349–357. doi: 10.1093/intqhc/mzm042

Tracy, S. J. (2010). Qualitative quality: Eight "big-tent" criteria for excellent qualitative research. *Qualitative inquiry*, *16*(10), 837-851.doi: 10.1177/1077800410383121

Veith, E. M., Sherman, J. E., Pellino, T. A., & Yasui, N. Y. (2006). Qualitative analysis of the peer-mentoring relationship among individuals with spinal cord injury. *Rehabilitation Psychology*, *51*(4), 289–298. doi.org/10.1037/0090-5550.51.4.289

Waltz, T. J., Powell, B. J., Fernández, M. E., Abadie, B., & Damschroder, L. J. (2019). Choosing implementation strategies to address contextual barriers: Diversity in recommendations and future directions. *Implementation Science*, *14*(42), 1-15. doi:10.1186/s13012-019-0892-4

Weatherson, K. A., McKay, R., Gainforth, H. L., & Jung, M. E. (2017). Barriers and facilitators to the implementation of a school-based physical activity policy in Canada: Application of the theoretical domains framework. *BMC Public Health*, *17*(835), 1–16. doi:10.1186/s12889-017-4846-y

Willis, C. D., Saul, J., Bevan, H., Scheirer, M. A., Best, A., Greenhalgh, T., Mannion, R., Cornelissen, E., Howland, D., Jenkins, E., & Bitz, J. (2016). Sustaining organizational

culture change in health systems. *Journal of Health Organization and Management*, *30*(1), 2–30. doi:10.1108/JHOM-07-2014-0117

Yin, R. K. (2014). *Case Study Research Design and Methods (5th ed.)*. Thousand Oaks, CA: Sage. doi: 10.3138/cjpe.30.1.108

Zhou, S., Ma, J., Dong, X., Li, N., Duan, Y., Wang, Z., ... & Zheng, Z. J. (2022). Barriers and enablers in the implementation of a quality improvement program for acute coronary syndromes in hospitals: a qualitative analysis using the consolidated framework for implementation research. *Implementation Science, 17*(1), 36. doi:10.1186/s13012-022-01207-6

Bridging Text

Chapter four is an original manuscript that identified barriers, facilitators, and collaboration processes within an ongoing SCI peer mentorship program provided by a community-based organization at a rehabilitation center. This chapter highlighted the importance of the collaboration relationship between the SCI mentors and the rehabilitation health professionals within the program. However, this chapter did not capture the relationship between SCI mentors and mentees, which is another important aspect of the implementation and maintenance of SCI peer mentorship programs. Chapter five explored the dyadic interactions and relationships between the SCI mentors and the mentees within the program examined in Chapter four and provided additional practical recommendations for community-based organizations and rehabilitation institutions to implement and maintain SCI peer mentorship programs.

Chapter Five: Creative-non-fiction approach to explore peer mentorship for individuals with spinal cord injury

Zhiyang Shi[1,2], Jeffrey G. Caron[2,3], Jacques Comeau[1], Pierre Lepage[4], & Shane N. Sweet[1,2]

McGill University[1]

Centre for Interdisciplinary Rehabilitation Research in Metropolitan Montreal[2]

Université de Montréal[3]

HEC Montréal[4]

(Published)

Shi, Z., Caron, J. G., Comeau, J., Lepage, P., & Sweet, S. N. (2024). Creative nonfiction approach to explore peer mentorship for individuals with spinal cord injury. *Rehabilitation Psychology.* Advance online publication. https://doi.org/10.1037/rep0000542

Abstract

Purpose: Research has examined peer mentorship to understand how it may help people with spinal cord injury (SCI) adapt and thrive. We still lack an in-depth understanding of the perspectives of SCI peer mentors and mentees on their dyadic relationship. This study was to explore the dyadic interactions and relationships between SCI peer mentors and mentees in a peer mentorship program delivered at a rehabilitation center.

Research method: Between 2016 and 2017, we recruited two dyads of peer mentor and mentee with SCI (N=4). Each participant completed three one-on-one interviews (N=12). Data were analyzed using a creative non-fiction approach.

Results: Three unique dialogical stories were developed. Story 1 (A slow and steady start) described how mentors took a mentee-centered approach in building the relationship. Story 2 (Mentorship and friendship: negotiating the "grey zone") highlighted how mentees and mentors experienced challenges in navigating the boundaries between mentorship and friendship. Story 3 (The "endless" job for mentor) showcased how the relationship could enter a phase in which it could affect mentors' well-being.

Conclusions: The stories highlighted important attributes to the relationships between SCI mentors and mentees. Considerations were suggested for community-based SCI organizations to integrate peer mentorship into rehabilitation settings, including optimizing mentorship introductions and matching, defining mentors' role explicitly, and building support systems for mentors.

Keywords: Disability; Peer support; Rehabilitation; Qualitative methods; Well-being

Creative-non-fiction approach to explore peer mentorship for individuals with spinal cord injury

Impact and Implications

- The creative non-fiction stories in this study provided insights on some of the nuances of SCI peer mentorship relationships that are only broadly mentioned in past studies, including mentorship introduction, friendship-mentorship boundaries, and burdens on mentors.
- To develop and/or optimize SCI peer mentorship programs within rehabilitation, community-based organizations and rehabilitation institutions can consider an informal approach to facilitate mentor-mentee connections, while clearly defining roles and responsibilities for mentors.
- Because mentors may maintain contacts with mentees beyond rehabilitation settings, organizers of peer mentorship programs need to build support systems to ensure mentors can manage the extra demand.

Introduction

As a peer interaction that aims to help individuals who share similar lived experiences adapt and thrive, peer mentorship has received growing attention in the spinal cord injury (SCI) domain (Barclay & Hilton, 2019; Shaw et al., 2019). Studies have examined peer mentorship to help understand how it may be an important strategy to benefit people with SCI (Balcazar et al., 2011; Beauchamp et al., 2016; Chemtob et al., 2018; Sweet et al., 2018; Veith et al., 2006). A meta-synthesis study identified 87 outcomes of SCI peer mentorship, including confidence, understanding, and community engagement (Rocchi et al., 2022). Randomized controlled trials found peer mentorship interventions to help increase self-efficacy, self-management skills, and community integration (Gassaway et al., 2019; Houlihan et al., 2017). Although some studies

highlighted the value of peer mentorship for individuals with SCI, there remains little information regarding how the day-to-day interactions between mentors and mentees can result in these positive impacts.

One reason may be the complexities of the SCI peer mentor-mentee relationship. For example, previous research has shown that a peer mentor can play many different roles (e.g., counsellor, educator) in the relationship (Barclay & Hilton, 2019). Mentors and mentees tend to have conversations that cover a wide range of topics (e.g., personal information, leisure, and healthcare), which can vary across different mentor-mentee dyads (Haas et al., 2013; McKay et al., 2022). A high-quality mentor might demonstrate multiple characteristics, such as being empathetic and mentee-focused (Chemtob et al., 2018; Gainforth et al., 2019; Shaw et al., 2018). Furthermore, we start seeing the profound negative impact of peer mentorship, particularly on mentors who experienced elevated time and energy demands (Alexander et al., 2022; Sweet et al., 2021b). Despite this growing body of literature, most of the research on SCI peer mentorship has done so from the perspective of the mentee or the mentor, rather than examining the dyadic relationships from both perspectives. One of the few studies that captured both mentor and mentee perspectives in the same study is from McKay et al. (2022), who recorded and analyzed real-life conversations between SCI mentor-mentee dyads. The authors found that the mentor-mentee relationship might shift towards a reciprocal relationship in which mentees demonstrated increasing desire to offer support to mentors in return. Results from McKay et al. (2022) indicated that relationships between mentors and mentees might be ‘fluid’ rather than ‘static or fixed’ (p. 10). However, the methods used in this study were unable to capture how these dyadic conversations were carried out, or how the evolving relationship could affect people with SCI.

Taken together, researchers are still in the very early stages of understanding the nature of dyadic SCI peer mentorship relationships.

The purpose of this study was to explore the dyadic interactions and relationships between SCI peer mentors and mentees within a peer mentorship program delivered by a community-based organization at a rehabilitation center. The study was also guided by three research questions: 1) how was the relationship between SCI mentors and mentees formed? 2) how were mentor-mentee interactions carried out in a real-life peer mentorship program? 3) how did the SCI peer mentorship relationship evolve over time?

Methods

Methodological Philosophy

This study was guided by an interpretivist paradigm, wherein we acknowledge that multiple realities exist based on individuals' lived experiences (relativist ontological assumptions) and that knowledge was co-created by bringing together diverse perspectives from the participants and the researchers (subjectivist epistemological assumptions; Guba & Lincoln, 1994; Poucher et al., 2019). All participants in this study were individuals with SCI, while our research team includes one person with SCI and four university researchers who self-identify as being non-disabled. Our philosophical position informed our selection of a qualitative case study design which smaller sample sizes with multiple data collections are standard (Bradbury-Jones et al., 2017; Mayan, 2016; Poucher et al., 2020). Specifically, participants and researchers produced data collectively through conversations over the course of multiple interviews. In analyzing and writing the stories, we, the researchers, integrated our interpretations of the data within participants' experiences to develop creative but non-fiction stories. Importantly, the co-author with lived experience with SCI and peer mentorship participated in analysis, interpretation, and

development of the creative non-fiction stories. We outline these points so that readers can take into consideration our philosophical position when engaging with this paper.

Participants and Data Collection

We obtained ethical approval through our university research ethics board. Eligible participants (1) were adults living with SCI, (2) had participated in the SCI peer mentorship program as a mentee or mentor, and (3) were able to communicate verbally in English or French. The recruitment was first advertised by emails sent to peer mentees of a local SCI community-based organization which offers peer mentorship services at a rehabilitation center. The community-based organizational staff, including SCI peer mentors, have an on-site office at the rehabilitation center and deliver the services through daily interactions with patients with SCI. The peer mentorship services have been continuously delivered by the community-based organization at the rehabilitation center for more than forty years. Peer mentees who expressed interest in participating were asked to identify a mentor who they believed would be interested in having a discussion on peer mentorship and to forward the mentor a recruitment email. Participation of the mentees and identified mentors was voluntary and confidential. The email contained a consent form outlining the purpose, research questions, and procedures of the study. Two dyads of SCI peer mentor and mentee (four individuals) participated in the study. No data collection was conducted before obtaining participants' written consent. Five peer mentees consented to participate in an initial interview. Two of these individuals completed the study. Two mentors consented to participate and completed all three interviews.

The second author (JC) conducted three telephone interviews with each participant. As such, four participants and a total of 12 interviews aligns with the qualitative case study methodology selected with this study (Bradbury-Jones et al., 2017). This sample size is also

reasonable because: a) our focus was to explore nuances and possible situations within the mentor-mentee relationship rather than generalizing results since the relationship could be unique across individuals; b) three phone interviews were conducted with each participant at different time. Each interview was no longer than one hour to minimize demands on participants; c) a diverse sample in terms of personal and disability identity was recruited; d) the sample size reflects the relatively small number of individuals with peer mentorship experiences in this community; and e) the interview data was adequate to identify themes as potential story plots (Braun & Clarke, 2021). The interviews with each participant occurred one week apart. Following an interview guide (Appendix 5.A), the first interview aimed to know participants' backgrounds, day-to-day lives, and SCI-related information. The second interview focused on the topic of peer mentorship. The third interview asked participants to talk about their counterpart in the peer mentorship relationship. Prior to each interview, the interviewer reminded the participants that the interviews would be confidential. Each interview was approximately 45 minutes in duration. All interviews were conducted between 2016 and 2017. Data are only available on request from the first author (ZS).

Data Analysis

All audio recordings were transcribed verbatim. We used a two-phase creative non-fictional analytical approach to develop stories that were deeply committed to the data yet fictional in form (Cavallerio, 2021; Smith et al., 2013; Smith et al., 2015).

The first phase was to conduct a thematic narrative analysis to identify the content of the stories (Alexander et al., 2022; McGannon, 2016; Orr et al., 2021; Smith, 2016). The first author ZS and the fourth author PL began with listening to the interview recordings and reading over the transcripts multiple times to gain familiarity with the data. Using Nvivo, they separately

extracted and coded quotes from the transcripts based on their perception on the relevancy to the research purpose and questions. The content beyond peer mentorship since participants spoke about their general lived experiences (e.g., family) was also coded. Next, all the codes from the four participants were mapped together, which allowed us to have discussions and make decisions on the codes jointly. We identified the common themes that the mentors talked about their experiences with the mentees, as well the common themes that mentees shared on their experiences with the mentors. Additionally, we discussed the experiences and perspectives shared by the two dyads and identified common themes by integrating quotes from both dyads. A thematic narrative analysis report that outlined the themes and the corresponding codes was finalized.

The analysis report was reviewed and discussed by our entire research team through email exchanges and two online meetings. One major comment from the team was the lack of interrelationship for the themes identified. This comment helped the first author to further organize and build a hierarchical relationship for the themes (Table 5.1). For example, we identified two overarching/level-1 themes by separating the quotes relevant to participants' general lived experience from the ones about their peer mentorship experiences.

The second analytical phase was developing stories based on the thematic narrative analysis results. Developing stories allowed us to engage readers (Smith et al., 2013), while preserving anonymity and confidentiality of the four participants in stories (Bignold, 2011). The first author connected the themes as plot points to develop story proposals, which included a title, a setting, a beginning, a middle, and an ending of each story (Smith et al., 2015). The main idea/middle part of each story was built around the theme that highlights an important component of peer interactions and was relevant to the research purpose. Other themes identified

were also integrated into the story to help set up the main story behind the peer interactions. The first author tried different iterations of aligning the themes to create a logical flow to each narrative story. The placement of the themes was also to build the linkage between each story and to ensure a flow to the overall stories that highlighted different aspects of peer interactions. For example, the themes that were more relevant to the early peer interactions were placed in the first story, while the ones that were more important to the later phase of the relationship were put in the second and the third story. Representative quotes from the interviews were also presented in the proposals to demonstrate the link between the story plots and the data, which helped the team to challenge the first author's decision and suggest alternative ways of organizing the stories (Orr et al., 2021).

Based on the story proposals, the first author wrote the stories by weaving participants' quotes with creative writing. The third author JC also contributed to the writing by making sure that the language was appropriate and consistent with the third author's lived experiences of peer mentorship interactions. Minor modifications were made to the quotes to make them fit smoothly into the stories (e.g., change the pronouns). The creative writing was to provide contextual details for the stories and to build connection and logics between the quotes. The quotes were presented in italics in the results as our way to demonstrate the non-fictional portion of the stories. We also applied some techniques for creative non-fictional writing, such as characterization scene by scene writing, capturing dialogues, and using an active voice (Caulley, 2008). For example, two characters were created to represent the mentor and the mentee, who were described using gender-neutral names and pronouns (e.g., they) to make the stories relate across different gender identities. Another technique that has been frequently used was to

integrate realistic details, such as facial and bodily features, to provide readers with images and emotions in the stories.

How We Developed Rigor

Developing rigor for this qualitative study required us to select the methods and the criteria coherent with our philosophical positioning. For the thematic narrative analysis, the second author is an insider in the community who confirmed that the themes resonated with their experiences and represented the mentor-mentee relationships. We went through a multi-round revising process for all three stories. We started with the initial draft of the first story. Each co-author provided iterative feedback on the story. We tracked the changes and comments on the stories so that the co-authors could reflect on and build up each other's edits and feedback. The second author JC, the fourth author PL, and the fifth author SS made comments and edits on the diction, logic, cohesiveness, concision, evocation, significance, and aesthetic value of the story (Smith et al., 2013). For example, because three of the interviews with one participant were conducted in French, the translation of the quotes might change the meaning. However, all the authors are proficient in both English and French who reviewed and ensured the accuracy the translated quotes included in the stories. In addition, the second and the fifth author with experience in creative non-fiction analysis challenged the first author's writing as critical friends (e.g., ensuring the creative writing aligned with the data) and integrated unique ideas (e.g., adding new plots) into the story using their expertise in disability research. The story was also reviewed by the third author who had worked as a SCI peer mentor for over ten years. The third author's input ensured the story was relevant and meaningful to the real-life experience of mentors and mentees in the peer mentorship program. The other two stories also went through the same revising process which helped us ensure the reflexivity and credibility of all the stories.

Compared to mainstream qualitative methods, using a creative non-fiction analytical approach provides an avenue to write result sections that reflects the richness of the data in story format (Blodgett et al., 2011; Smith et al., 2013). Such a format uses engaging and accessible language to contextualize experiences and stimulate imagination; and therefore, have greater potential to transfer knowledge among a wider range of audiences, particularly people beyond academia (Smith, McGannon, and Williams, 2015). Taken together, our stories met the criteria that align with our relativist ontology and subjectivist epistemology, including reflexivity, credibility, and transferability (Alexandra et al., 2021; Smith & McGannon, 2018).

Results

A summary of the thematic narrative analysis was in Table 5.1. Two story characters and three stories were developed. Because the small sample size runs a risk of identifying the participants, no demographic information was presented. The participants have differences in terms of their age, gender, race, disability status, and sexual orientation. The participants were two men and two women, one French-speaker and three English-speakers, above 18 years old, and wheelchair users, with at least one who did not identify as heterosexual and at least one who did not identify as white.

The Two Characters

Alex (the mentee)

My life is like a roller coaster, emotion wise, a lot of ups and downs because of the three accidents that I've had. It has never been constant, but I feel that I'm lucky to be here. So we can say I am stubborn, but in a nice way. When I have something in mind I just go for it. For instance, when I was younger I decided to study abroad, and I travelled quite a lot by myself. *One trip in particular had a profound impact on me: it was my trip to Asia. I learned lots of*

things about life and the value of it being a lot more inwards than outwards. I got my answers so now I deal with what I have to do, and what I have to do is to be the best I can with what I have, in the time I have.

Carey (the mentor)

I've been a peer mentor for over five years and that is after experimenting different jobs and moving around a lot. Now, I don't see myself doing something else. *One day, a friend of mine told me about an opportunity for a job as a peer mentor for people with SCI and asked me 'why don't you try it?'. As a person who seems to jump into things without thinking of what the repercussions might be, I said 'why not'.*

Being the eldest of three children, my brothers would even say that I am bossy, but it is true, I decide everything. I have been really present, in charge, and acted very responsibly. I've always taken care of others before taking care of myself, so I guess I am very giving and caring. I also think that I am good company and enjoy going out with friends… or to have them over. If I am on my own, I enjoy travelling, reading, and driving. These activities are just my way of escaping from the work week and whatever may be happening on the job.

The Three Stories

The three stories move through three different situations over the course of the mentor-mentee relationship, starting with the first introduction to the post-rehabilitation interaction between Alex and Carey.

Story One - A Slow and Steady Start

Lunch time, Alex wheels from their room to the cafeteria, excited to chat with other patients. Alex and the other patients are all in the rehab center following a spinal cord injury. As Alex enters the cafeteria, they hear:

‘Hey, how’s it going?’ Alex looks around and sees a person in a powerchair signaling to them, ‘Speak of the devil, we were just talking about you.’ Using their thumb to hit the joystick, the powerchair user moves their chair to make room for Alex at the table.

‘What?! You were talking about me?’ Alex shrugs and asks.

‘Yeah, you know Carey from the local organization, right? We talked yesterday for the first time.’ The powerchair user looks at Alex and continues ‘Carey told me that they have a T4 level of injury, same level as yours, right? Did you know that?’

Alex raises their black-rimmed glasses and answers ‘No, but I do know of Carey. *I remember Carey often stays where we would take our meals and… if someone passes by, Carey just says “hi”.* I actually never talk to Carey. How did you two start talking?’

The wheelchair user explains: ‘Well, *every Wednesday* I go to *the lessons about spinal cord injury* and Carey was there. *I introduced myself to Carey and asked a question, “What’s life like after [rehab]?” And you know, it just happened like that, just like a coincidence.’*

‘Oh, that’s interesting.’ Alex says. After a brief silence in reflection, Alex decides to give peer mentorship a try and mumbles: ‘I’ll try to talk to Carey tomorrow before my therapy.’

The next day. Carey’s last working day of the week, and they are in a morning rush, moving slowly as they drive to the rehab center. Thanks to the snowplows last night, the middle of the road has been cleared, leaving only the white snow banks, knee deep.

Carey arrives at nine o’clock. Once at the office, Carey finds a person in a wheelchair waiting. It is Alex who is in a loose grey sweater. ‘Hi Carey, I’m Alex. I’m a patient here and umm…’ Alex isn’t sure what else to say.

Carey sees Alex and says: ‘Hey Alex, I know you! *When you and the other guys arrived, I introduced myself what I did.* Do you remember?*’*

Alex responds, awkwardly: 'Yeah, I remember…but I never umm…'

Carey understands and responds, 'Well, *sometimes [patients] won't talk to me because they think I'm another patient, while other times [patients] would talk to me because they believe I'm another patient. They will start by asking me why I'm here, what happened to me…* I know it can be confusing and intimidating as this spinal cord injury stuff is all new and it's a shock. But you know, *my job is to go to people, to start by introducing myself simply and naturally, then afterwards the bond, it develops. It is created as we talk.'*

'Fair enough.' Alex chuckles and says, '*I was very busy* since I got here *and we didn't have time to meet up… so I mean, can I have your cell number then I can give you a call because I want to know more about you?'*

'Oh, of course!' Carey reaches into their jacket and searches for their phone, '*I'm here four days a week, except for when I go to the office at our organization*, so you can always see me around.'

Alex responds, 'Yes, I heard from another patient that *you see each other twice a week, and you take the time to exchange, to know how he is doing, how he's progressing in his rehabilitation.'*

'Yeah, *there may be structured appointments. When I can't meet someone, we can call each other to make an appointment. But the majority of cases are not structured meetings.* Most times, we just chat as we cross paths.' Carey continues.

Alex listens to Carey's story with their upper body leaning forward. Alex is clearly interested and curious. Alex takes a quick glance at their watch, wanting to be able to talk to Carey more before their physiotherapy session in five minutes. Unfortunately, Alex has to go.

Lowering their voice and seeming apologetic, Alex says: ‘Carey, I wish I could have more time to talk to you but I have to take off. I gotta get to physiotherapy.’

‘No worries!’ Carey says, ‘You’ve got my number now so *you know how to reach me’*.

Carey’s words make Alex feel comfortable, so they smile, and Carey smiles too. There seems to be no better way to end this conversation than with smiles. Nothing is warmer than the smiles in this fierce winter. Alex is off to physiotherapy.

Alex gets back to their room after the physiotherapy. They lie cozily on the bed, recalling the morning conversation, ‘The other patients are right. Carey *is very nice and loves helping people. It’s like, if anyone asks me for my cell number, am I willing to give it to that person?* Probably not…but *Carey was like “of course”. They have to be someone who wants to share their experience. You know, people can at times be thinking of themselves, so I would say that not everyone would be able to do what Carey is doing,’* Alex grins and pulls up the blanket, ‘*We didn’t have a long conversation, but I know Carey is there for me.’*

After a long day of work, Carey is back home sitting quietly in an armchair, holding a mug with freshly brewed rooibos tea in it. Carey starts to think, ‘It’s great to see Alex make this first step. *The fact that [Alex was] open to talking to us, they want to express themselves about what happens to them and want to hear us, is already a good thing. It makes it easy to understand them and know where they might be able to be helped by a mentor and what things we can do.’* Carey takes a sip of the hot tea, *‘There are some [patients] who don’t want to talk. For example, some will tell us that they are not interested in our help, while others won’t tell us but will keep a certain distance, and that’s okay. We [mentors] are always respectful* of what the patients want*.’*

Story Two – Mentorship and Friendship: Negotiating the 'Grey Zone'

The afternoon sun shines into the hallway of the rehab center. Nurses, doctors, and therapists are busy – moving from ward to ward. In the hallway, two people in wheelchairs are talking. Their voices are low, as if they don't want to disturb others. It's Alex and Carey, the mentee and the mentor.

Alex says: 'I mean, you are totally right. *We are living with something similar* [SCI], *but we don't need the same things. For me, the hardest thing is the neuropathic pain, and for someone else, it can be the disability.'*

Carey nods, without interrupting.

'*I was crying and crying because it's so painful,* but I take on all the suffering by myself.' Alex lowers their head and continues, '*I was anxious to get back on my own, I've gone from the best to the worst. My family sort of drew away from me. I've got children, but after my accident, we are not that close. It's the hardest part.'*

From Alex's soft tone, Carey senses that Alex wants to say something else but feels embarrassed to say. 'Tell me more if you want. We have plenty of time'.

Alex continues: '*In my condition, there's a lot of ups and downs, it's a roller coaster type of emotion. There are good days and other days that it's not even there.'*

Carey nods as a response, which elicits a gentle, appreciative look on Alex's face.

Alex says: 'I couldn't talk about these emotions with my family, but I can talk to you. *I just told you about the family withdrawing from me*. *All these things are personal, but* you listen to me.' Alex looks up and continues, 'You *are a good listener*. It's like, *you are able to put yourself aside and you one hundred percent focus on me*.'

Carey smiles and says: 'Thanks. *Sometimes, I don't need to give you an answer every time. I've learned that sometimes all people need is that we listen to them.'*

'Exactly!' Alex responds in a second, 'Thinking of how much you have done for me, we see each other and talk every week like this, *you phone me sometimes, we write sometimes, text messages*…' Alex continues to say, 'And now I see *it's important for me to care more about you too. You deserve it, and it is what we do for friendship*.' Alex takes out their phone from the messenger bag slung on them and asks: 'I should friend you on Facebook. Are you on Facebook? Let me add you.'

'Facebook friends?!' Carey repeats to themself in a confused tone, 'How should I answer that? *I don't have a huge Facebook page. But the few things I have are just about me and my personal (and private) life. I don't know if I want everybody—I mean, all my clients, to know everything about me.* Alex shouldn't *know that I'm homosexual*. I never want to share too much about that. *Although it doesn't say* 'I am homosexual' *on my Facebook page, a lot of pages are with me and friends, who are mostly the same gender as me, and who just happen to be in contexts that aren't typical. I have a number of clients who will occasionally make homophobic comments or whatever. So, if I add them on my Facebook page, and they go on my page and see that, what does that do to my professional ability to help them?'*

Carey is in a spiral… forcing a response to Alex in an attempt to divert the conversation away from Facebook. But internally, Carey continues to ruminate about how to deal with this situation: 'What if I turn Alex down? *The important part of being a peer mentor is being real*. *Coming into the job and having a professional face is just not being fair to your mentees, to your peers. I think that they [mentees] deserve us [mentors] to be completely pure and true about who*

we are and what we've done. I mean, it's our responsibility—particularly in this kind of mentoring relationship and your role is to talk about what you have been through.'

Carey's mind is racing; heart is pumping. This is way more stressful than they ever thought. Here we go again: '*I try to provide a very safe environment* for all of my mentees. *And in doing so, Alex really opens up and I feel like I am talking to Alex not just talking to some patient. I don't think it's appropriate to be friends with mentees in the early parts, because they don't need a friend. They need somebody who can help them with whatever I'm helping them with. But over time, I think friendships can develop.* But Alex is special. Alex is fun, open-minded, and easy to chat with. *I may have actually become a friend with Alex* over the last little while, in addition to being *their mentor.* I guess it makes sense to "friend" Alex on Facebook.*'*

Alex's voice snaps Carey out of their intense blank stare: 'Carey, how to spell your last name?'

'Um… it's Aucoin, A-U-C-O-I-N…' Carey whispers while looking down that their hands clasped tightly on their lap. The decision weighs heavily on Carey.

'Ah! I found you. Request sent—perfect!'

'Yeah, perfect…', Carey mumbles silently while watching Alex do the whole Facebook thing, without saying more words.

'So fun!' Alex says, 'but I gotta go to physio – talk to you later, friend!'

A gentle smile remains on Carey's face, but underneath things are not so easy.

It's 11pm. The neighborhood is quiet with a yellow glow from the street lamps. Carey is curled up in bed, reflecting on the decision to accept Alex's Facebook friend request. The yellow glow from the streets is bright enough to show the anxiety on Carey's face—the clenched jaw and frown lines on their brow. Carey spent so much time after dinner 'cleaning up' their

Facebook page, removing anything that might be to too much to share with a mentee like Alex. 'How could I be so stupid?' is Carey's thought playing on repeat like a bad song.

Carey can't fall asleep. 'Why did I say yes?' Repeats again and then spirals to, 'Will Alex share my Facebook contact with more people? ... What if I wake up tomorrow and see a few more friend requests? … How do I say no to other mentees, mentors, and even nurses and therapists? *…, if I lose track of the line between the professional and personal thing. I cannot be as effective.* I will no longer be a good mentor.*'* It's now well past midnight, and Carey is still tossing and turning.

[A comic script showcasing the story 2, see Figure 5.1]

Story Three – The 'Endless' Job for Mentor

On a sweaty, July day, in the midst of a seemingly endless heat wave, Alex is reflecting back, 'I cannot believe it's been 4 months already since I left the rehab center'. Indeed, Alex is home from the rehab center and starting to feel settled in. Alex fondly remembers the sadness of saying goodbye to Carey earlier this spring. It was the last time they saw each other. They keep in touch by talking on the phone and texting most weeks.

Alex is home alone in their apartment. A drop of sweat flows down from Alex's chubby cheekbones. The room is hot and sticky. Alex is starting to feel pretty uncomfortable—yes because of the summer heat, but mostly because what's been on their mind for quite some time; their sexuality issues.

Alex is constantly searching for information online. 'Gosh', they say to themself in frustration, 'None of the people online seems to feel the same way as I do. It's so hard for me to express how I feel during sex. It would be great to talk to someone, but my doctor's appointment isn't until next month…'

Alex thinks of Carey: '*Anytime I need Carey, I give Carey a call, or if I need some guidance for something, I go to find Carey. And Carey is always open to that*.' Alex grabs the phone from the tea table, looking for Carey's name.

'Brrrrrr …brrrrrrrr', Alex makes the call.

'Bzzzz-bzzzz', Carey's phone starts vibrating.

Carey just selected a movie on TV, and is sitting on a dark brown sofa. Carey is off work on Fridays and tries to take advantage of their off time, *watching movies almost every Friday afternoon, because it's just Carey's way of getting out of their own head.*

The phone vibrates beside Carey's lap. Grabbing the phone, pausing the movie, Carey sees Alex's name on the screen, and mutters: 'That's Alex… Is it urgent? I have no idea...'

The phone keeps on vibrating, 'Bzzzz…Bzzzz'. Panic is setting in. Carey can't stop thinking, 'Should I pick up? Should I pick up?' Carey thinks 'As a mentor, I should, because *I want to take care of people [mentees], that characteristic is a big plus* of mine to do this job. It's also a *commitment, I will be there if I sense any sort of need*.'

Glancing at the TV, Carey calms their mind by reminding themself that this is their Friday treat: 'Whoa, Whoa! I don't need to be a mentor right now. *When I leave the center, my work is over. When I get home, it may happen to me to think about my mentee, because I know I'm going to see them again either the next day or the following week. However, I don't let it obsess me all day and night.* I will just let it go for now.'

Without pressing 'decline', Carey puts the phone aside and lets it go to voicemail. Feeling satisfied, Carey restarts the movie. As good as the movie might be, their thoughts keep returning to the voicemail that is surely waiting. Then a phone buzz confirms it, Alex left a message. Carey is determined to ignore it as they need to put the effort in for self-care.

Ten minutes pass and Carey realizes that ignoring the voicemail isn't working. The thought that Alex's message might be important keeps interrupting Carey's attempt to get into the movie. Carey can't help noticing the phone. A few more drops of sweat appear on their forehead. The only way to calm the anxiety is to deal with the voicemail. Pausing the movie again, Carey grabs the phone and sends a quick text, 'Hey Alex, I saw that you called. I can't talk right now, is it something urgent?'

The message reaches Alex in half of a second. Alex sees the message and realizes that it isn't a good time to call, so Alex responds to Carey: 'Nothing urgent! You can call me when you have time.'

Seeing Alex's message, Carey sighs as their mind fills with a variety of thoughts: 'I guess Alex doesn't know I am off work. Alex is just one of the mentees who have left the center, but can still reach me because I shared my number.'

'Sometimes being a mentor can be very burdensome and even hard emotionally'. What happened today makes Carey reflect on their emotional challenges and experiences of burnouts as a mentor: '*In five years, I've only had one period where there has been a little burnout, but that shouldn't have happened.* Our organization should be aware of that and do something about it.' Carey continues, 'What I would *suggest is that we [mentors] have a psychologist on call.* If a mentor's feeling something negative and needs support, the organization would have someone who the mentor can talk to. I hope that *the organization can implement more things to ensure that we [mentors] don't have burnouts, and to make sure that we are not left out alone.'*

Turning off the TV halfway through the movie that no longer appeals to them, Carey closes their eyes and sighs deeply. Obviously, Carey didn't unwind on this Friday. Being a mentor can sometimes feel like an endless job.

Discussion

The purpose of our study was to explore the dyadic interactions and relationships between SCI mentors and mentees within a community-based peer mentorship program delivered in a rehabilitation center. Based on the participants' verbal accounts, we developed three stories showcasing mentee-focused mentorship, mentorship-friendship boundaries, and impact of mentorship on mentors. We attempted to showcase the complexity of the dyadic interactions between mentors and mentees while highlighting how the relationship could evolve. These stories provide insights on some nuances of the SCI mentor-mentee relationship that are only broadly mentioned in past studies.

According to one of the narrative themes identified in this study (i.e. mentee-centered approach), a personalized, mentee-focused style of peer mentorships is an important attribute to the mentorship relationship. Previous studies noted that mentors who adopted a person-centered style were more capable to build and maintain a positive relationship with their mentees (Alexander et al., 2022; Gainforth et al., 2019; Shaw et al., 2018). Of importance, this mentee-focused approach equates to not forcing mentorship on rehabilitation patients, especially when they are not ready or interested in interacting with a peer mentor. Mentees' readiness to be mentored is a critical consideration for the mentorship process (Sweet et al., 2021a). Past literature has highlighted that people who have a new SCI might be managing the new realities and facets of living with a disability such as psychological impacts, lack of financial support, and social disconnection (Barclay et al., 2016; Shi et al., 2020). Yet, how mentee readiness can be addressed has not received as much attention in the literature. Our results appeared to favor informal introduction to mentorship in rehabilitation settings as a way to facilitate mentee readiness.

Introductions to peer mentorship and matching approaches between mentors and mentees have received growing attention in the SCI literature. In our study, the mentees leaned towards the mentor(s) who they wanted to talk to according to their specific needs. Our finding aligned with past research suggesting that matching on interest and common lived experience was a favorable approach compared to matching on age, gender, or levels of injuries (Gainforth et al., 2019; Gassaway et al., 2017; Veith et al., 2006). However, more research is needed to understand if certain matching approaches have a significant influence on the relationship (does matching matter) and how it can affect the impacts of mentorship (how matching matters; Shaw et al., 2021). SCI mentors and community-based organizations need to take into consideration individuals' different situations and determine appropriate timing to introduce peer mentorship (Sweet et al., 2021a), particularly in a rehabilitation setting. For example, mentors may give quick informal greetings/check-ins and be present in common space without inquiring so that mentees can build comfort around mentors (Duque et al., 2021).

Another important element of SCI peer mentorship was the mentorship-friendship boundary. We found that the mentee experienced difficulties in distinguishing between a mentor and a friend. In fact, mentees with SCI often state 'feel amongst friends' in their mentorship experiences (Sweet et al., 2021b; p.5). This reaction is logical because peer mentors often become an important source of social support in the rehabilitation process (Monden et al., 2014). Furthermore, mentors reported having trouble managing boundary-crossing situations and keeping their roles separate, which might be due to a lack of understanding of their responsibilities in the relationship (Chemtob et al., 2018). In a healthcare context, care providers (e.g., nurses) were encouraged to receive a clear delineation of their responsibilities and ongoing guidance to help navigate their roles (Slobogian et al., 2017). Our recommendation for peer

mentorship program organizers/creators is to set up explicit expectations and boundaries of their mentorship programs and make sure mentors and mentees understand their roles. For example, mentors and mentees could receive training on possible boundary-crossing situations, such as sharing personal contact, physical touching, and answering sensitive questions (Ryan et al., 2017).

Past studies reported the negative outcomes of peer mentorship relationships for mentors with SCI (Sweet et al., 2021b; Alexander et al., 2022), without a further look at the potential causes of these outcomes. Our study highlighted how the mentors' emotional well-being can be affected by the blurry friendship-mentorship boundaries alongside mentors' investments in mentees' lives. We found that being 'off work' did not always mean being free from the responsibilities of being a mentor. Mentors may struggle with feelings of commitment to be available for their mentee. They may also worry about causing a mentorship relationship to weaken if the mentors prioritize their personal life. Such demands on mentors can cause compassion fatigue and stress, impacting mentors' well-being and willingness to continue being a mentor (Sweet et al., 2021b; Alexander et al., 2022). Given the challenge in retaining mentors, community-based SCI organizations and/or rehabilitation institutions may need to communicate with their mentors more frequently and put in place resources to promote mentors' well-being (Ariapooran, 2014; Barr, 2017).

Limitations and Constraints on Generality

The lived experiences presented in the stories are specific to the context that we investigated. The context of this study (e.g., type of program, rehabilitation setting) may not resemble other programs or settings due to the variability of peer support provision in SCI (Barclay & Hilton, 2019). The interviews were conducted prior to the Covid-19 pandemic which

may limit generality given some mentorship approaches might have changed due to the disruption of the pandemic. Future research may investigate the impact of the pandemic on SCI peer mentorship relationships, especially surrounding the increased use of virtual communication methods. For example, the friendship-mentorship boundary may be further affected than described in this study by the increasing interactions with others through phone calls, text, or social media of individuals with SCI upon the pandemic (Bhattarai et al., 2023). The interviews were participants' retrospective recall of the relationship. We encourage future research to capture prospective data on diverse mentorship experiences of individuals with SCI. In sum, the objective of this study was to explore some of the attributes of SCI mentor-mentee relationships and provide considerations for community-based organizations and rehabilitation institutions to develop and optimize SCI peer mentorship programs. Our intention is not to generalize the findings among all individuals with SCI involved in mentorship relationships.

Conclusion

By using a creative non-fiction approach to develop three stories based on the interview data, we explored important attributes to the dyadic mentorship relationships between SCI mentors and mentees. We highlighted how the mentors prioritized the mentees' needs in building the relationship, as well as the issue around friendship-mentorship boundaries and its profound impact on the relationship. We made recommendations for community-based SCI organizations, rehabilitation institutions, and future research, including to take a closer look at different ways of mentorship introductions and matching, to explicitly define mentors' role according to the needs (friend vs. professional mentor), and to build support systems for mentors.

References

Alexander, D., Caron, J. G., Comeau, J., & Sweet, S. N. (2022). An exploration of the roles and experiences of SCI peer mentors using creative non-fiction. *Disability and Rehabilitation*, *44*(22), 6824-6832. https://doi.org/10.1080/09638288.2021.1977395

Ariapooran, S. (2014). Compassion fatigue and burnout in Iranian nurses: The role of perceived social support. *Iranian Journal of Nursing and Midwifery Research*, *19*(3), 279–284. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4061629/

Balcazar, F. E., Kelly, E. H., Keys, C. B., & Balfanz-Vertiz, K. (2011). Using peer mentoring to support the rehabilitation of individuals with violently acquired spinal cord injuries. *Journal of Applied Rehabilitation Counseling*, *42*(4), 3–11. https://psycnet.apa.org/record/2012-01897-001

Barclay, L., & Hilton, G. M. (2019). A scoping review of peer-led interventions following spinal cord injury. *Spinal Cord*, *57*(8), 626–635. https://doi.org/10.1038/s41393-019-0297-x

Barclay, L., McDonald, R., Lentin, P., & Bourke-Taylor, H. (2016). Facilitators and barriers to social and community participation following spinal cord injury. *Australian Occupational Therapy Journal*, *63*(1), 19–28. https://doi.org/10.1111/1440-1630.12241

Barr, P. (2017). Compassion fatigue and compassion satisfaction in neonatal intensive care unit nurses: Relationships with work stress and perceived social support. *Traumatology*, *23*(2), 214–222. https://doi.org/10.1037/trm0000115

Beauchamp, M. R., Scarlett, L. J., Ruissen, G. R., Connelly, C. E., McBride, C. B., Casemore, S., & Martin Ginis, K. A. (2016). Peer mentoring of adults with spinal cord injury: A transformational leadership perspective. *Disability and Rehabilitation, 38*(19), 1884-1892. https://www.tandfonline.com/doi/abs/10.3109/09638288.2015.1107773

Bhattarai, M., Sherpa, P. D., & Limbu, S. (2023). A qualitative study of coping strategies in persons with spinal cord injury during the COVID-19 pandemic. *Rehabilitation Psychology, 68*(1), 25–31. https://doi.org/10.1037/rep0000477

Bignold, Wendy. 2011. 'Creative non-fiction: one approach to narrative research in education.' *Educational Futures 4*(1): 19-27. Available at: https://educationstudies.org.uk/?p=556

Blodgett, A. T., Schinke, R. J., Smith, B., Peltier, D., & Pheasant, C. (2011). In Indigenous Words: Exploring Vignettes as a Narrative Strategy for Presenting the Research Voices of Aboriginal Community Members. *Qualitative Inquiry*, *17*(6), 522–533. https://doi.org/10.1177/1077800411409885

Bradbury-Jones, C., Breckenridge, J., Clark, M. T., Herber, O. R., Wagstaff, C., & Taylor, J. (2017). The state of qualitative research in health and social science literature: a focused mapping review and synthesis. *International Journal of Social Research Methodology, 20*(6), 627-645. http://dx.doi.org/10.1080/13645579.2016.1270583

Braun, V., & Clarke, V. (2021). To saturate or not to saturate? Questioning data saturation as a useful concept for thematic analysis and sample-size rationales. *Qualitative Research in Sport, Exercise and Health, 13*(2), 201-216.

Caulley, D. N. (2008). Making Qualitative Research Reports Less Boring: The Techniques of Writing Creative Nonfiction. *Qualitative Inquiry*, *14*(3), 424–449. https://doi.org/10.1177/1077800407311961

Cavallerio, F. (Ed.). (2021). *Creative Nonfiction in Sport and Exercise Research*. Routledge. https://doi.org/10.4324/9781003038900

Chemtob, K., Caron, J. G., Fortier, M. S., Latimer-Cheung, A. E., Zelaya, W., & Sweet, S. N. (2018). Exploring the peer mentorship experiences of adults with spinal cord injury. *Rehabilitation Psychology*, *63*(4), 542–552. https://doi.org/10.1037/rep0000228

Duque, M., Annemans, M., Pink, S., & Spong, L. (2021). Everyday comforting practices in psychiatric hospital environments: A design anthropology approach. *Journal of Psychiatric and Mental Health Nursing*, *28*(4), 644–655. https://doi.org/10.1111/jpm.12711

Gainforth, H. L., Giroux, E. E., Shaw, R. B., Casemore, S., Clarke, T. Y., McBride, C. B., Garnett, C. V., & Sweet, S. N. (2019). Investigating Characteristics of Quality Peer Mentors With Spinal Cord Injury. *Archives of Physical Medicine and Rehabilitation*, *100*(10), 1916–1923. https://doi.org/10.1016/j.apmr.2019.04.019

Gassaway, J., Jones, M. L., Sweatman, W. M., Hong, M., Anziano, P., & DeVault, K. (2017). Effects of Peer Mentoring on Self-Efficacy and Hospital Readmission After Inpatient Rehabilitation of Individuals With Spinal Cord Injury: A Randomized Controlled Trial. *Archives of Physical Medicine and Rehabilitation*, *98*(8), 1526-1534. https://doi.org/10.1016/j.apmr.2017.02.018

Gassaway, J., Jones, M. L., Sweatman, W. M., & Young, T. (2019). Peer-led, transformative learning approaches increase classroom engagement in care self-management classes during inpatient rehabilitation of individuals with spinal cord injury. *The Journal of Spinal Cord Medicine, 42*(3), 338–346. https://doi.org/10.1080/10790268.2017.1385992

Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 105–117). Sage Publications, Inc.

Haas, B. M., Price, L., & Freeman, J. A. (2013). Qualitative evaluation of a Community Peer Support Service for people with spinal cord injury. *Spinal Cord*, *51*(4), 295–299. https://doi.org/10.1038/sc.2012.143

Houlihan, B. V., Brody, M., Everhart-Skeels, S., Pernigotti, D., Burnett, S., Zazula, J., Green, C., Hasiotis, S., Belliveau, T., Seetharama, S., Rosenblum, D., & Jette, A. (2017). Randomized Trial of a Peer-Led, Telephone-Based Empowerment Intervention for Persons With Chronic Spinal Cord Injury Improves Health Self-Management. *Archives of Physical Medicine and Rehabilitation*, *98*(6), 1067-1076.e1. https://doi.org/10.1016/j.apmr.2017.02.005

Mayan, M. J. (2016). *Essentials of Qualitative Inquiry*. Routledge. https://doi.org/10.4324/9781315429250

McGannon, K. R. (2016). "Critical Discourse Analysis in Sport and Exercise: What, Why, and How." In B. Smith and A. C. Sparkes (Eds.), In *Routledge handbook of qualitative research in sport and exercise* (pp. 230–242). Routledge.

McKay, R. C., Giroux, E. E., Baxter, K. L., Casemore, S., Clarke, T. Y., McBride, C. B., Sweet, S. N., & Gainforth, H. L. (2022). Investigating the peer Mentor-Mentee relationship: Characterizing peer mentorship conversations between people with spinal cord injury. *Disability and Rehabilitation*, *45*(6), 962-973. https://doi.org/10.1080/09638288.2022.2046184

Monden, K. R., Trost, Z., Catalano, D., Garner, A. N., Symcox, J., Driver, S., Hamilton, R. G., & Warren, A. M. (2014). Resilience following spinal cord injury: A phenomenological view. *Spinal Cord*, *52*(3), 197–201. https://doi.org/10.1038/sc.2013.159

Orr, K., Smith, B., Arbour-Nicitopoulos, K. P., & Wright, F. V. (2021). The café talk: A discussion of the process of developing a creative non-fiction. *Qualitative Research in Sport, Exercise and Health*, *13*(6), 887–903. https://doi.org/10.1080/2159676X.2020.1834443

Poucher, Z. A., Tamminen, K. A., Caron, J. G., & Sweet, S. N. (2020). Thinking through and designing qualitative research studies: A focused mapping review of 30 years of qualitative research in sport psychology. *International Review of Sport and Exercise Psychology*, *13*(1), 163–186. https://doi.org/10.1080/1750984X.2019.1656276

Rocchi, M. A., Shi, Z., Shaw, R. B., McBride, C. B., & Sweet, S. N. (2022). Identifying the outcomes of participating in peer mentorship for adults living with spinal cord injury: A qualitative meta-synthesis. *Psychology & Health*, *37*(4), 523–544. https://doi.org/10.1080/08870446.2021.1890729

Ryan, S. M., Nauheimer, J. M., George, C. L., & Dague, E. B. (2017). "The Most Defining Experience": Undergraduate University Students' Experiences Mentoring Students with Intellectual and Developmental Disabilities. *Journal of Postsecondary Education and Disability, 30*(3), 283–298. Available at: https://files.eric.ed.gov/fulltext/EJ1164002.pdf

Shaw, R. B., Lawrason, S. V. C., Todd, K. R., & Martin Ginis, K. A. (2021). A Scoping Review of Peer Mentorship Studies for People with Disabilities: Exploring Interaction Modality and Frequency of Interaction. *Health Communication*, *36*(14), 1841–1851. https://doi.org/10.1080/10410236.2020.1796293

Shaw, R. B., McBride, C. B., Casemore, S., & Martin Ginis, K. A. (2018). Transformational mentoring: Leadership behaviors of spinal cord injury peer mentors. *Rehabilitation Psychology*, *63*(1), 131–140. https://doi.org/10.1037/rep0000176

Shaw, R. B., Sweet, S. N., McBride, C. B., Adair, W. K., & Martin Ginis, K. A. (2019). Operationalizing the reach, effectiveness, adoption, implementation, maintenance (RE-AIM) framework to evaluate the collective impact of autonomous community programs that promote health and well-being. *BMC Public Health*, *19*(1), 803. https://doi.org/10.1186/s12889-019-7131-4

Shi, Z., Koch, J., Schaefer, L., Li, Q., Wang, L., & Sweet, S. N. (2020). Exploring how Chinese adults living with spinal cord injury viewed the prospect of inpatient peer support programs within a hospital-based rehabilitation setting. *Spinal Cord*, *58*(11), 1206-1215. https://doi.org/10.1038/s41393-020-0490-y

Slobogian, V., Giles, J., & Rent, T. (2017). #Boundaries: When patients become friends. *Canadian Oncology Nursing Journal = Revue Canadienne De Nursing Oncologique*, *27*(4), 394–396. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6516352/

Smith, B. (2016). Narrative analysis in sport and exercise: How can it be done? In *Routledge handbook of qualitative research in sport and exercise* (pp. 282-295). Routledge.

Smith, B., & McGannon, K. R. (2018). Developing rigor in qualitative research: Problems and opportunities within sport and exercise psychology. *International Review of Sport and Exercise Psychology, 11*(1), 101–121. https://doi.org/10.1080/1750984X.2017.1317357

Smith, B., McGannon, K., & Williams, T. (2015). Ethnographic creative non-fiction: Exploring the what's, why's and how's. In *Ethnographies in sport and exercise research*. Routledge

Smith, B., Papathomas, A., Martin Ginis, K. A., & Latimer-Cheung, A. E. (2013). Understanding physical activity in spinal cord injury rehabilitation: Translating and communicating research through stories. *Disability and Rehabilitation*, *35*(24), 2046–2055. https://doi.org/10.3109/09638288.2013.805821

Sweet, S. N., Hennig, L., Pastore, O. L., Hawley, S., Clarke, T. Y., Flaro, H., Schaefer, L., & Gainforth, H. L. (2021a). Understanding peer mentorship programs delivered by Canadian SCI community-based organizations: Perspectives on mentors and organizational considerations. *Spinal Cord*, *59*(12), 1285-1293. https://doi.org/10.1038/s41393-021-00721-6

Sweet, S. N., Hennig, L., Shi, Z., Clarke, T., Flaro, H., Hawley, S., Schaefer, L., & Gainforth, H. L. (2021b). Outcomes of peer mentorship for people living with spinal cord injury: Perspectives from members of Canadian community-based SCI organizations. *Spinal Cord*, *59*(12), 1301-1308. https://doi.org/10.1038/s41393-021-00725-2

Sweet, S. N., Michalovic, E., Latimer-Cheung, A. E., Fortier, M., Noreau, L., Zelaya, W., & Martin Ginis, K. A. (2018). Spinal Cord Injury Peer Mentorship: Applying Self-Determination Theory to Explain Quality of Life and Participation. *Archives of Physical Medicine and Rehabilitation*, *99*(3), 468-476.e12. https://doi.org/10.1016/j.apmr.2017.08.487

Veith, E. M., Sherman, J. E., Pellino, T. A., & Yasui, N. Y. (2006). Qualitative analysis of the peer-mentoring relationship among individuals with spinal cord injury. *Rehabilitation Psychology*, *51*(4), 289–298. https://doi.org/10.1037/0090-5550.51.4.289

Chapter Six: General Discussion

This chapter provides an overall summary of the findings, discusses the theoretical and practical implications of the findings, and highlights the future research directions.

Summary of Findings

The overall purpose of this doctoral thesis was to identify key determinants (barriers and facilitators), individual and organization processes of implementing SCI peer mentorship programs in rehabilitation settings. At an organizational level, establishing an optimal program structure (e.g., adaptability, minimal cost to mentees) contributes to successful implementation of SCI peer mentorship programs (Chapter four). In addition, a patient-centered team culture, collaborative work infrastructure, and access to community-based resources are facilitators to implementing a SCI peer mentorship program (Chapter three and four). At an individual level, engaging health professionals and patients with SCI, as well as establishing dynamic relationships between these individuals and SCI mentors are key processes for rehabilitation and community organizations to implement a peer mentorship program (Chapter three, four, and five). We found that mentors, mentees, and health professionals are the three main players within SCI peer mentorship programs implemented in rehabilitation settings. Strengthening communication and drawing clear boundaries among these individuals may lead to a sustainable peer mentorship program. Overall, effective implementation of SCI peer mentorship programs in rehabilitation settings consists of 1) assessing the needs of the three main players (SCI mentors, mentees, health professionals) and leveraging available organizational resources, 2) creating flexibility in the program structure and drawing clear boundaries to build and maintain quality relationships among the three key players.

Theoretical and Practical Implications

The determinants, individual and organization processes identified in this thesis enriched the SCI peer mentorship literature and may inform the development and implementation of SCI peer mentorship programs in rehabilitation settings. We categorized the theoretical and practical

implications of this thesis into two topics: 1) need assessment and resource management; 2) relationship building and maintenance.

Need Assessment and Resource Management

In Chapter four and five, we examined an ongoing peer mentorship program delivered by a SCI community organization at a rehabilitation center. Within this program, the mentors who are hired by the community organization have a strong presence at the rehabilitation center because the center provides them with space and time to interact with the patients. However, some rehabilitation settings may not have such resources, or the resources from community organizations cannot meet their needs. For example, the Chinese hospital in Chapter three does not have any access to community resources and would need to develop a program internally. This situation may require this hospital to leverage local resources, such as identifying mentors from its SCI clientele. By contrast, the Canadian hospital in Chapter three may take advantage of certain community-based resources (e.g., professional mentors). However, implementing onsite mentors may not meet the needs because this Canadian hospital mainly offers services to outpatients who live in the community.

Therefore, need assessment and resource management are important processes for rehabilitation and community organizations to develop and implement SCI peer mentorship programs. Need assessment includes collecting information about the priorities, preferences, and needs of both program recipients (i.e., patients) and deliverers (i.e., mentors, health professionals; Damschroder et al., 2022). This thesis moved away from the previous research focus on the patient/mentees' needs (e.g., Shi et al., 2020). Instead, prominent needs of SCI mentors (e.g., emotional support and clear boundary, Chapter five) and health professionals (e.g., lack of time, Chapter three) were identified in this thesis. The needs of these program deliverers

were found to facilitate or hinder the implementation of the program and should be considered in developing and implementing a peer mentorship program.

Effective resource management can also lead to successful implementation of a peer mentorship program. Our findings are consistent with the past research, which identified funding, training, education, physical space, and time as the most critical resources for implementation (Lazzara et al., 2014). For example, we suggested that training and education may help SCI mentors manage their professional role and maintain work-life balance (Chapter five). Moreover, human resources are highlighted as one of the top priorities in all the three chapters. Implementation of a SCI peer mentorship program relies on active engagement of health professionals and SCI mentors who are able to invest time and energy in the program (Chapter three and four). Because staff shortage has been one of the biggest challenges faced by healthcare systems and community organizations (Chervoni-Knapp, 2022; Li & Chen, 2022), those who plan to implement a peer mentorship program may need to have "slack resources" in place, particularly slack human resources. Slack human resources may include remuneration, wellness benefits, flexible schedules, and temporary workers, which are in excess of the requirements necessary for the efficient operation (McHugh & Cross, 2021). These resources may enable frontline staff members to "squeeze" time for the program on top of what they are already doing without significantly impacting other priorities (Huang & Li, 2012).

Relationship Building and Maintenance

Another key aspect of implementing SCI peer mentorship programs in rehabilitation settings is the dynamic relationship between the individuals involved. We identified the three key players in SCI peer mentorship programs – SCI mentees, mentors, and health professionals. The majority of the past research focused on relationships between SCI mentors and mentees. In

Chapter three and four, we offered new insights into the relationships between health professionals and SCI mentors. In Chapter five, we expanded our understanding of the nature of mentor-mentee relationships by capturing the evolvement of the relationship and the mentorship-friendship boundary, which were not examined by past research. Taken together, this thesis contributed to the literature by highlighting many nuances of the interpersonal relationships among the three key players within SCI peer mentorship programs.

Building relationships among the three key players within a SCI peer mentorship program may require rehabilitation and community organizations to create flexibility within the program structure. We found that interactions between mentors and health professionals, as well as between mentors and mentees often occurred in an organic, informal context. These individuals were able to build and maintain relationships because the program created flexible time and space for them to come across and initiate conversations with each other. By having this flexibility in the program, information sharing between health professionals and mentors could take place in a daily basis, and thus problem solving was timely. In addition, mentees and mentors were able to adjust their interaction approaches (e.g., frequency, length, topics) based on their needs (Shaw et al., 2022). Rehabilitation and community organizations should ensure that mentors, mentees, and health professionals have the flexibility to engage in or disengage from a mentorship relationship if these individuals are not ready or find the relationship negative to their emotional well-being (Sweet et al., 2021).

Having clear boundaries were found to be critical to maintain the relationship among the three key players within a SCI peer mentorship program. Roles and responsibilities of health professionals and SCI mentors should be explicitly defined within the program to minimize the risk of conflicts and poor collaboration. Chapter four only identified one method that the

organizations used to set the boundary between health professionals and SCI mentors, which is to have a formal agreement on mentors' access to patient information. Rehabilitation and community organizations may attempt other strategies to strengthen the boundaries between health professionals and SCI mentors, such as interprofessional education (i.e., creating opportunities for the two players to learn with, from and about each other; Cameron, 2011). In addition, drawing explicit boundaries between mentors and mentees may help these individuals avoid misunderstanding and confusion in the relationship. In Chapter five, the blurred mentorship-friendship boundary appears to impact on the mentors' mental health. Future research may examine how SCI mentors and mentees could effectively manage the boundary and protect their well-being. Overall, past research broadly discussed the boundary issue between mentor and mentee within community-based peer mentorship programs (Sweet et al., 2021). In this thesis, we identified the interpersonal boundary among health professionals, mentors, and mentees as a unique element of SCI peer mentorship programs implemented in rehabilitation settings.

Conceptual and Methodological Implications

The Consolidated Framework of Implementation Research (CFIR; Damschroder et al., 2009) was used to guide the conceptualization of Chapter three and four. Although the CFIR has been widely used in implementation research, our research offered insights into the under-researched aspects of the CFIR (Esmail et al., 2020). First, our research discussed the interplay between some CFIR constructs, such as engaging, opportunity, implementation leads. Further, our research increased the understanding of the relative importance between some of the CFIR constructs in the SCI peer mentorship context. Finally, we suggested novel implementation strategies corresponding to some of the CFIR constructs.

The interplay between the CFIR constructs (italic in this paragraph) has rarely been investigated in past research (Esmail et al., 2020), which limits our ability to understand the connections between the constructs across the five CFIR categories (i.e., innovation, outer setting, inner setting, individuals, implementation process). In this thesis, we attempted to shed light on this knowledge gap by discussing how the constructs from one category (e.g., implementation process) may be related to the constructs from another category (e.g., individuals). For example, *engaging* health professionals (from implementation process category) may require rehabilitation organizations to first address frontline health professionals' lack of time (low *opportunity*; from individuals category). To address the low *opportunity* barrier, rehabilitation and community organizations may assign *implementation leads* (from individuals category) and/or share human resources through organizational *partnerships and connections* (from outer setting category). These examples showcase that the connections between CFIR constructs can be identified within and beyond the CFIR categories. Therefore, future CFIR users may need to place greater emphasis on the complex interplay of the constructs than solely discussing their results based on the original five CFIR categories.

Increasing our understanding of the relative importance of CFIR constructs was also highlighted in past research (Esmail et al., 2020). Given we used the CFIR in both pre-implementation (Chapter three) and implementation phases (Chapter four), our research demonstrated the possible importance of some CFIR constructs in the SCI peer mentorship context. Three CFIR constructs (*engaging, knowledge, team culture*) were identified in both phases, suggesting that these factors may be of particular importance to the implementation of SCI peer mentorship programs (Varsi et al., 2015). However, the relative importance of the constructs was mostly described post-hoc rather than being part of the research questions. To

further advance the CFIR, future research may need to explicitly examine the relative importance of CFIR constructs within and beyond the SCI peer mentorship context.

A range of implementation strategies to address/leverage implementation barriers and facilitators were suggested in the literature, such as the Expert Recommendations for Implementing Change (ERIC; Powell et al., 2015). Some of the ERIC strategies overlapped with the implementation processes identified in this thesis. For example, the ERIC recommendation of conducting local needs assessment was identified as a key pre-implementation process in Chapter three and four. We found that a better understanding of the needs of mentors, mentees, and health professionals might help these individuals avoid the barriers of lack of time and burnout. Additionally, the ERIC recommendation of revising professional roles aligned with the implementation process of defining health professionals' roles within the peer mentorship program to facilitate these individuals' engagement (Chapter three). However, the majority of the ERIC strategies (e.g., develop a formal implementation blueprint) focus on a general implementation context, while few were specific enough to help implement SCI peer mentorship programs in rehabilitation settings. In this thesis, novel implementation strategies were suggested by the health professionals, SCI mentors, and mentees. For example, sharing common workspace was identified as a strategy to promote health professionals' engagement and strengthening inter-professional collaboration between health professionals and SCI mentors (Chapter four). Compared to strategies outlined in the broader literature, the ones suggested in this thesis may be more relevant and effective to address/leverage barriers and facilitators in the SCI peer mentorship program implementation context.

From a methodological perspective, this PhD thesis used multiple qualitative designs and methods to collect and analyze data. Chapter three and four adopted qualitative (multiple) case

study design to examine the implementation of SCI peer mentorship programs in three specific contexts located in two countries. We collected the contextual information of the local contexts and discussed how these contextual factors (e.g., organizational characteristics) could have an impact on the implementation of SCI peer mentorship programs. We answered the call for rigorous, "context-rich" case studies of global implementation research (Beecroft et al., 2022). In addition, we used a creative non-fictional research approach in Chapter five. This approach has been used by other researchers to transform SCI mentors' perspectives into monologue stories (Alexander et al., 2022). The stories in this thesis are unique from the past research because they integrated the perspectives of both SCI mentors and mentees. In addition, our stories used a combination of dialogue and monologue to showcase the dyadic mentor-mentee relationship and interactions. Together, the use of these qualitative designs and methods allowed this thesis to rigorously transform individuals' reports of their lived experiences into evidence-based knowledge that could be used in implementing SCI peer mentorship programs.

Strength and Limitation

According to Hamilton and Finley (2019), qualitative methods are essential in implementation research because they provide a rigorous and efficient way to answer "how" and "why" questions, and we need the answers to know how (and whether) to proceed with the implementation efforts. Qualitative research is also appropriate to discover and document the context in which implementation occurs, as well as the process that occurs during implementation (Hamilton & Finley; 2019). Last, qualitative methods are suitable to reveal organizational and interpersonal dynamics affecting the implementation (Harvey et al., 2018). A strength of this thesis is that we used a range of qualitative methods (e.g., interview, focus group, cross-case analysis) to: 1) answer our general research question on *how* to implement SCI peer

mentorship programs in rehabilitation settings; 2) collect the contextual elements (i.e., barriers, facilitators, organizational characteristics) that affect the implementation of the SCI peer mentorship program; and 3) examine the relationships among the three key players within SCI peer mentorship programs.

We acknowledge that our philosophical positions shift from post-positivism towards interpretivism across the three chapters. Specifically, our ontological assumption shifts from critical realist (Chapter three and four) towards relativist (Chapter five), while our epistemological assumption remains subjectivist. In Chapter three and four, we used the CFIR to identify barriers and facilitators to the implementation of SCI peer mentorship programs. A part of the investigation focused on the "objective aspects" of the implementation, such as the organizational structure, resources, and program characteristics; while the other part examined the individual experiences and perceptions, including the knowledge and motivation of the health professionals and their relationship with the mentors. As such, critical realist ontology is appropriate for Chapter three and four because it "simultaneously recognizes the existence of knowledge independent of humans but also the socially embedded and fallible nature of scientific inquiry" (Clark, 2008; p. 167). By contrast, relativism is better suited for Chapter five because we focused on the mentorship relationship that is completely dependent on the lived experience of SCI mentors and mentees (Poucher et al., 2019). Our subjectivist epistemology was consistent across the three chapters because the knowledge was always produced through the "transactions between researchers and participants" (Poucher et al., 2019; p.165). We acknowledge that researchers' background and experiences inform our interpretation and described the researchers' information in all three chapters. Rectifying our philosophical positions across the three chapters might align better with a "pragmatic paradigm", in which we

accept that "there can be single or multiple realities" and "our choice of one version of reality over another is governed by how well that choice results in anticipated or desired outcomes" (Kaushik & Walsh, 2019; p.258).

Methodological limitations are outlined in each chapter. One limitation throughout the research process was the inconsistent level of knowledge user engagement. Our intention was to meaningfully engage knowledge users of the rehabilitation and community organizations throughout the research process (Gainforth et al., 2021). Unfortunately, the knowledge users from the organizations were only engaged in method development, recruitment, and a part of the analysis. We attempted to avoid tokenism by sharing decision-making and maintaining communication with these individuals by having in-person visits, email check-in, and teleconference, but still failed to establish a solid research partnership. In research domains such as psychology and health, the development of research partnership is still in its infancy (Gagliardi et al., 2017; Shwed et al., 2023). For example, over half of research partnerships in the biotechnology field failed (Kehrel et al., 2016). Some reasons for our unsuccessful partnership are similar to the ones encountered by other partnerships, including low operational compatibility, unilateral exchange of information, and inadequate partnership experience (Kehrel et al., 2016). The capacity of our knowledge users, particularly the hospital staff, was significantly affected by the pandemic. In addition, some decisions were not made through bilateral communication because the needs and priorities of the knowledge users (e.g., implementing a program independently and instantly) might not align with our research objectives. Despite this unsuccessful partnership, the research process offered a learning opportunity for both sides to obtain experience of partnership research.

Future Research and Conclusion

This thesis identified key determinants, individual and organization processes of implementing SCI peer mentorship programs in rehabilitation settings. Individual processes included developing dynamic relationships among SCI mentors, mentees, and health professionals by creating flexibility in the program structure, as well as maintaining clear boundaries between these individuals. This thesis separately looked at the relationship between health professionals and mentors (Chapter three and four), as well as the relationship between mentors and mentees (Chapter five). Future research may examine how the three key players integrate as a whole within SCI peer mentorship programs. Key organizational processes of implementing SCI peer mentorship programs included planning the program according to needs of local SCI mentors, mentees, and health professionals, leveraging available resources, as well as fostering a patient-centered, collaborative team culture. Future research can further examine the interplay and relative importance of these processes. Taken together, this thesis offered insight into the implementation of SCI peer mentorship programs in rehabilitation settings and may inform development, implementation, and optimization of these programs in order to promote the well-being of individuals with SCI.

References

Alexander, D., Caron, J. G., Comeau, J., & Sweet, S. N. (2022). An exploration of the roles and experiences of SCI peer mentors using creative non-fiction. *Disability and Rehabilitation*, *44*(22), 6824–6832. doi:10.1080/09638288.2021.1977395

Beecroft, B., Sturke, R., Neta, G., & Ramaswamy, R. (2022). The "case" for case studies: Why we need high-quality examples of global implementation research. *Implementation Science Communications*, *3*(1), 15. https://doi.org/10.1186/s43058-021-00227-5

Cameron, A. (2011). Impermeable boundaries? Developments in professional and inter-professional practice. *Journal of Interprofessional Care*, *25*(1), 53–58. https://doi.org/10.3109/13561820.2010.488766

Chervoni-Knapp, T. (2022). The staffing shortage pandemic. *Journal of Radiology Nursing*, *41*(2), 74–75. https://doi.org/10.1016/j.jradnu.2022.02.007

Clark, A. (2008). Critical realism. In L. Given (Ed.), *The Sage encyclopedia of qualitative research methods* (pp. 168–170). Thousand Oaks, CA: Sage.

Damschroder, L. J., Aron, D. C., Keith, R. E., Kirsh, S. R., Alexander, J. A., & Lowery, J. C. (2009). Fostering implementation of health services research findings into practice: A consolidated framework for advancing implementation science. *Implementation Science*, *4*, 50. https://doi.org/10.1186/1748-5908-4-50

Damschroder, L. J., Reardon, C. M., Widerquist, M. A. O., & Lowery, J. (2022). The updated Consolidated Framework for Implementation Research based on user feedback. *Implementation Science*, *17*(1), 75. https://doi.org/10.1186/s13012-022-01245-0

Esmail, R., Hanson, H. M., Holroyd-Leduc, J., Brown, S., Strifler, L., Straus, S. E., Niven, D. J., & Clement, F. M. (2020). A scoping review of full-spectrum knowledge translation

theories, models, and frameworks. *Implementation Science, 15*(1), 11. https://doi.org/10.1186/s13012-020-0964-5

Gagliardi, A. R., Kothari, A., & Graham, I. D. (2017). Research agenda for integrated knowledge translation (IKT) in healthcare: What we know and do not yet know. *Journal of Epidemiology and Community Health, 71*(2), 105–106. https://doi.org/10.1136/jech-2016-207743

Gainforth, H. L., Hoekstra, F., McKay, R., McBride, C. B., Sweet, S. N., Martin Ginis, K. A., Anderson, K., Chernesky, J., Clarke, T., Forwell, S., Maffin, J., McPhail, L. T., Mortenson, W. B., Scarrow, G., Schaefer, L., Sibley, K. M., Athanasopoulos, P., & Willms, R. (2021). Integrated knowledge translation guiding principles for conducting and disseminating spinal cord injury research in partnership. *Archives of Physical Medicine and Rehabilitation, 102*(4), 656–663. https://doi.org/10.1016/j.apmr.2020.09.393

Hamilton, A. B., & Finley, E. P. (2019). Qualitative methods in implementation research: An introduction. *Psychiatry Research, 280*, 112516. https://doi.org/10.1016/j.psychres.2019.112516

Harvey, G., McCormack, B., Kitson, A., Lynch, E., & Titchen, A. (2018). Designing and implementing two facilitation interventions within the 'Facilitating Implementation of Research Evidence (FIRE)' study: A qualitative analysis from an external facilitators' perspective. *Implementation Science, 13*(1), 141. https://doi.org/10.1186/s13012-018-0812-z

Huang, J.-W., & Li, Y.-H. (2012). Slack resources in team learning and project performance. *Journal of Business Research*, *65*(3), 381–388. https://doi.org/10.1016/j.jbusres.2011.06.037

Karaferis, D., Aletras, V., Raikou, M., & Niakas, D. (2022). Factors influencing motivation and work engagement of healthcare professionals. *Materia Socio-Medica*, *34*(3), 216–224. https://doi.org/10.5455/msm.2022.34.216-224

Kaushik, V., & Walsh, C. A. (2019). Pragmatism as a research paradigm and its implications for social work research. *Social Sciences*, *8*(9), 255. https://doi.org/10.3390/socsci8090255

Kehrel, U., Klischan, K., & Sick, N. (2016). Why research partnerships fail in the biotechnology sector—An empirical analysis of strategic partnerships. *International Journal of Innovation and Technology Management*, *13*(01), 1650003. https://doi.org/10.1142/S0219877016500036

Lazzara, E. H., Benishek, L. E., Dietz, A. S., Salas, E., & Adriansen, D. J. (2014). Eight critical factors in creating and implementing a successful simulation program. *The Joint Commission Journal on Quality and Patient Safety*, *40*(1), 21–29. https://doi.org/10.1016/S1553-7250(14)40003-5

Li, B., & Chen, J. (2022). Barriers to community-based primary health care delivery in urban China: A systematic mapping review. *International Journal of Environmental Research and Public Health*, *19*(19), 12071. https://doi.org/10.3390/ijerph191912701

McHugh, J. P., & Cross, D. A. (2021). The application of organizational slack to hospital system responsiveness during the COVID-19 pandemic. *Journal of Hospital Management and Health Policy*, *5* A, 14. https://doi.org/10.21037/jhmhp-21-13

Poucher, Z. A., Tamminen, K. A., Caron, J. G., & Sweet, S. N. (2019). Thinking through and designing qualitative research studies: A focused mapping review of 30 years of qualitative research in sport psychology. *International Review of Sport and Exercise Psychology*, *13*(1), 163–186. https://doi.org/10.1080/1750984X.2019.1656276

Powell, B. J., Waltz, T. J., Chinman, M. J., Damschroder, L. J., Smith, J. L., Matthieu, M. M., Proctor, E. K., & Kirchner, J. E. (2015). A refined compilation of implementation strategies: Results from the Expert Recommendations for Implementing Change (ERIC) project. *Implementation Science*, *10*(1), 21. https://doi.org/10.1186/s13012-015-0209-1

Shaw, R. B., Giroux, E. E., Gainforth, H. L., McBride, C. B., Vierimaa, M., & Martin Ginis, K. A. (2022). Investigating the influence of interaction modality on the communication patterns of spinal cord injury peer mentors. *Patient Education and Counseling*, *105*(5), 1229–1236. https://doi.org/10.1016/j.pec.2021.09.008

Shi, Z., Koch, J., Schaefer, L., Li, Q., Wang, L., & Sweet, S. N. (2020). Exploring how Chinese adults living with spinal cord injury viewed the prospect of inpatient peer support programs within a hospital-based rehabilitation setting. *Spinal Cord*, *58*(11), 1206-1215. https://doi.org/10.1038/s41393-020-0490-y

Shwed, A., Hoekstra, F., Bhati, D., Athanasopoulos, P., Chernesky, J., Martin Ginis, K., McBride, C. B., Mortenson, W. B., Sibley, K. M., Sweet, S. N., Gainforth, H. L., & SCI Guiding Principles Panel. (2023). IKT Guiding Principles: Demonstration of diffusion and dissemination in partnership. *Research Involvement and Engagement*, *9*(1), 53. https://doi.org/10.1186/s40900-023-00462-1

Sweet, S. N., Hennig, L., Pastore, O. L., Hawley, S., Clarke, T. Y., Flaro, H., Schaefer, L., & Gainforth, H. L. (2021). Understanding peer mentorship programs delivered by Canadian

SCI community-based organizations: Perspectives on mentors and organizational considerations. *Spinal Cord*, *59*(12), 1285-1293. https://doi.org/10.1038/s41393-021-00721-6

Varsi, C., Ekstedt, M., Gammon, D., & Ruland, C. M. (2015). Using the Consolidated Framework for Implementation Research to identify barriers and facilitators for the implementation of an Internet-based patient-provider communication service in five settings: A qualitative study. *Journal of Medical Internet Research*, *17*(11), e5091. https://doi.org/10.2196/jmir.5091

Appendices

Appendix 3.A - Research Activity Engagement

The table below outlines the engagement of the named authors and hospital staff members through the research process. Our team situated within a post-positivist paradigm with an assumption of an independent, external reality (i.e., realist ontology) and a rejection in "bias-free" research (i.e., subjectivist epistemology). All research members self-identify as non-disabled. ZS is a doctoral trainee with expertise in qualitative methods and SCI peer mentorship research. AT, GB, HG, and SS are university professors with expertise in disability research. We recognized that the subjective values and prior lived experiences of our team shaped and mediated the research process of identifying the answers to our research questions.

Research Activity	**Initials**	**Activity Description**
Conceptual Design	ZS, GB, HG, AT, SS, VB*, VV*, LQ**	In multiple meetings, ZS and SS discussed the need of implementing SCI peer mentorship program and conducting a study to understand the implementation barriers and facilitators with staff members of the two rehabilitation hospitals (VB, VV, LQ). ZS and SS then had discussion with three university professors (GB, HG, AT) to define the research questions, study design, and the theoretical framework.
Preparing Study Materials and Methods	ZS, SS, VB*, VV*, LQ**	ZS, SS discussed and prepared the following study components: data resources; study documents (i.e., interview guides); inclusion criteria & sampling methods; recruitment methods; data collection timeline. VB, VV, and LQ provided feedback and made agreement on the feasibility of the proposed recruitment and data collection. ZS submitted the proposed study to the university and hospital research ethics board.
Recruitment	ZS, VB*, VV*, LQ**	ZS sent the recruitment materials and inclusion criteria to VB, VV, and LQ. VB, VV, and LQ distributed the recruitment materials through work emails. VB, VV, and LQ provided basic contact information (name, work title, and email) of the eligible participants who agreed to share their information with ZS. ZS contacted the eligible participants by emails and sent them the consent form.
Data Collection	ZS, VB*, VV*, LQ**	VB, VV, and LQ helped ZS coordinate time for the interviews and focus groups with

		participants. (Focus groups took place during regular team meetings) ZS conducted interviews and focus groups with participants.
Data Analysis	ZS, SS, VB*, VV*, LQ**	ZS transcribed the interviews and focus groups and conducted the thematic analysis. SS reviewed the preliminary analysis reports (single case and cross-cases) and provided feedback as a critical friend. ZS and SS had multiple meetings to finalize the cross-case analysis report. ZS presented and discussed the analysis results with VB, VV, LQ prior to writing the manuscript.
Manuscript Preparation	ZS, GB, HG, AT, SS	ZS and SS led the writing of the manuscript. The manuscript was sent to all named co-authors who provided edits and comments prior to submission.

*Staff member at the Canadian rehabilitation hospital
**Staff member at the Chinese hospital

Appendix 3.B - Interview Guide

(A) Focus group with participants at the Canadian hospital

1. Introduce the researcher, the research idea, the procedure of the focus group, turn on audio-recording

2. Round table introduction
    a. Could you please just tell me your name, your position, and how long you have been working at the hospital?

3. W*hat do* you know about peer mentorship for people with SCI? *[Characteristics of Individuals: Knowledge about the intervention]*
    a. What do you know about any other hospitals or other units at this hospital that have implemented such peer program or something similar? *[Outer Setting: Peer pressure]*

4. How do you think the clients with SCI will respond to a peer mentorship program being implemented in your hospital? *[Outer Setting: Patient Needs & Resources]*
    a. What barriers will your clients face to participating in the program?

5. What are the factors that will facilitate or hinder the implementation of a SCI peer mentorship program?
    a. What issues do we need to consider when implementing a SCI peer mentorship?
    b. What kind of support do you need to implement the program? *[Inner Setting: Readiness for implementation]*; Any support necessary from the leader level? *[Inner Setting: High-level leader]*
    c. How important is this peer mentorship program to your current service? [*Inner Setting: Implementation Climate]*; Might it take a backseat to other higher-priority going on now? *[Inner Setting: Relative priority]*
    d. To what extent are new ideas, such as a SCI peer mentorship program, embraced and used by your team to make improvements? *[Inner Setting: Culture]*
    e. What can be done to get buy-in from the hospital staff? *[Inner Setting: Implementation Climate]*

6. How can a SCI peer mentorship program be implemented by your team? *[Intervention Characteristics]*
    a. Who will be the persons involved? *[Characteristics of Individuals]*
    b. What is the goal of the program?
    c. How can peer mentors interact with patients in the program?
    d. How do you see your role, as health professionals, in the program?
        i. How can you work with peer mentors?
        ii. How can you facilitate patient participation in the program?

7. Ending: Appreciate their participation, ask their interest in doing a follow-up interview, highlight that there will be future work and happy to keep working with them.

(B) Follow-up interviews with participants at the Canadian hospital

1. Introduce the procedure of the interview, turn on audio-recording

2. Ask participants if they have any follow-up thoughts or questions upon the focus group.

3. What do you know about peer mentorship? *[Characteristics of Individuals: Knowledge about the intervention]*
    a. In your opinion, how can peer mentorship be utilized in the rehabilitation for patients with SCI?

4. If we want to implement a peer mentorship program for patients, what that program might look like? *[Intervention Characteristics]*
    a. What is the goal of the program?
    b. How do we deliver that program?
    c. How can peer mentors interact with patients in the program?

5. What can you do to support this program as a health professional? *[Characteristics of Individuals]*
    a. How do you see your role in the program?
    b. How can you facilitate patient participation in the program?

6. What obstacles or resources do we have to implement the program? *[Inner Setting: Readiness for implementation: Available Resources]*
    a. What issues do we need to consider when implementing a SCI peer mentorship?
    b. What kind of support do you need to implement the program? [Inner Setting: Readiness for implementation]; Any support necessary from the leader level?

7. How would you like to learn more about peer mentorship?

8. Ending: Appreciate their participation

(C) Interviews with participants at the Chinese hospital

1. Introduce the researcher, the research idea, the procedure of the interview, turn on audio-recording

2. Could you please just tell me your name, your position, and how long you have been working at the hospital?

3. What do you know about peer mentorship? *[Characteristics of Individuals: Knowledge about the intervention]*
    a. In your opinion, how can peer mentorship be utilized in the rehabilitation for patients with SCI?

4. If we want to implement a peer mentorship program for patients, what that program might look like? *[Intervention Characteristics]*
    a. What is the goal of the program?
    b. How do we deliver that program?
    c. How can peer mentors interact with patients in the program?

5. What can you do to support this program as a health professional? *[Characteristics of Individuals]*
    a. How do you see your role in the program?
    b. How can you facilitate patient participation in the program?

6. What obstacles or resources do we have to implement the program? *[Inner Setting: Readiness for implementation: Available Resources]*
    a. What issues do we need to consider when implementing a SCI peer mentorship?
    b. What kind of support do you need to implement the program? *[Inner Setting: Readiness for implementation]*; Any support necessary from the leader level? *[Inner Setting: High-level leader]*

7. How would you like to learn more about peer mentorship?

8. Ending: Appreciate their participation

Note: CFIR constructs were in italic. All interview guides were reviewed and discussed by ZS and SS.

Appendix 3.C - The Eight Universal Criteria for Qualitative Research

Criteria	Approach
Worthy topic	Highlighting the need of understanding the implementation barriers and facilitators in order to meet the desire of implementing SCI peer mentorship program of the two rehabilitation hospitals
Rich rigor	Using a theoretical framework (CFIR) to guide the analysis and engaging a critical friend in data collection and analysis
Sincerity	Reflecting on researchers' philosophical position and positionality.
Credibility	Using two data collection methods (interview and focus group) and providing detailed descriptions on the study contexts
Resonance	Showing participants' quotes in the results and discussing the results with the two rehabilitation hospitals prior to finalizing the manuscript
Significant contribution	Prioritizing the needs of the two rehabilitation hospitals and outlining practical recommendations for rehabilitation institutions to implement SCI peer mentorship programs in the document.
Ethics	Rigorously adhering to the procedures approved by the university ethics board. No ethical issues took place beyond the approved procedures.
Meaningful coherence	Using the methods coherent with the qualitative multiple-case design (Smith & McGannon, 2018; Smith et al., 2014)

Appendix 4.A - Interview Guide

Interview questions <u>with mentors</u>

1. Tell me about your role in the peer mentorship program at the rehabilitation center.
    a. what do you do in relation to the program? Your daily routine?

2. How is the peer mentorship program currently implemented?
    a. what is the modality of mentor-mentee interactions? e.g., duration, frequency?
    b. who developed the program/why the program being implemented at the rehabilitation center/how/why the collaboration between the community-based SCI organization and the rehabilitation center was initiated?
        i. if you don't know, who may know, any names?
    c. what is the process for deciding whether changes are needed to the program so that it works well at the rehabilitation center?
    d. What supports are available to help you deliver the program at the rehabilitation center?
    e. What kind of provincial, or national policies and/or financial factors influenced the decision to implement the program?

3. Who are the other persons involved in the peer mentorship program?
    a. Who are the hospital staff involved? Names and their positions? How do you work with them?
    b. Can you describe your working relationships with them? / What kinds of interactions do you have with them?
    c. When you need to get something done or to solve a problem, who are your "go-to" persons?
    d. Is there anyone who involved but currently left the program? Can you tell me about them?

4. How do you feel about the peer mentorship program at the rehabilitation center?
    a. How well do you think the program meets or doesn't meet the needs of the clients with SCI?
    b. How well do or do not the hospital staff/professionals support the program?
    c. How is the program meeting or not meeting your expectations, primarily based on how it is delivered and/or integrated within the rehabilitation center?

5. What are your lesson learned from delivering the peer mentorship program?
    a. What recommendations do you have to hospitals and rehabilitation centers that aim to integrate a SCI peer mentorship program?

Interview questions <u>with mentees:</u>

1. Could you please introduce yourself?
    a. How long had you been receiving healthcare services at the rehabilitation center?
    b. How long have you been receiving peer mentorship from the community-based SCI organization?
    c. (If the participant has already left the rehabilitation center), are you still receiving peer mentorship or other services from the community-based SCI organization?

2. How did you interact with the mentors at the rehabilitation center?
    a. What type of conversation did you have with the mentor?
    b. How did you benefit from the mentorship?
3. What service did you receive from healthcare professionals at the rehabilitation center?
    a. Are the healthcare professionals involved in the mentorship program?
    b. If so, who are they and how are they involved?

4. Thinking of what the mentors do at the rehabilitation center, what are the differences and similarities between their role and health professionals' roles?
    a. What are the complementary areas between health professionals and mentors? / How do they complement each other's work? How well do or do not the health professionals support the program?
    b. What added value do the health professionals bring on top of the mentorship service?
    c. Is there any area where the services provided health professional vs mentors are in conflict? / (for example: If a mentor offers an advice, might a nurse offer something is opposite?)

5. How do you feel about the peer mentorship program at the rehabilitation center?
    a. How well do you think the program meets or doesn't meet your needs?
    b. How can the program be improved?
    c. What recommendations do you have to hospitals and rehabilitation centers that want to offer peer mentorship to their clients with SCI?

Interview questions <u>with health professionals:</u>

1. Tell me about your role at the rehabilitation center,

2. How have you been involved in the SCI peer mentorship program?
    a. What do you do in relation to the program?

3. Who are the other persons involved in the peer mentorship program?
    a. What kinds of interactions do you have with them? / How do you work with them?
    b. Who are the health professionals involved in the peer mentorship program? What positions they have?
        i. How do you work with them in supporting the peer mentorship program?

4. How is the peer mentorship program currently implemented at the rehabilitation center?
    a. how the clients with SCI interact with the mentors from the community-based SCI organization? (e.g., where they meet, how often?)
    b. Who developed the program/why the program being implemented at the rehabilitation center/ how/why the collaboration between the rehabilitation center and the community-based SCI organization was initiated?
        i. if you don't know, who may know, any names?
    c. What is the process for deciding whether changes are needed to the peer mentorship program so that it works well at the rehabilitation center?
    d. When you need to get something done or to solve a problem, what do you do / who are your "go-to" persons?
    e. What kind of provincial, or national policies and/or financial factors influenced the decision to deliver the program?
    f. Is there anyone who involved but currently left the program? Can you tell me about them?

5. How do you feel about the peer mentorship program at the rehabilitation center?

    a. How well do you think the program meets or doesn't meet the needs of the clients with SCI?
    b. How well do you think the health professionals have supported the program?
    c. How is the program meeting or not your expectations, based on how it is delivered at the rehabilitation center?

6. What are your lesson learned about working with the mentors?
    a. What recommendations do you have to hospitals and rehabilitation centers that aim to integrate a peer mentorship program for their clients with SCI?

Interview questions <u>with program director:</u>

1. Tell me about your role at the community-based SCI organization.
    a. How long have you been working for the community-based SCI organization?
    b. What are your main job duties at the community-based SCI organization?

2. What role are you taking in the peer mentorship program at the rehabilitation center?

3. How does the community-based SCI organization and the rehabilitation center to deliver the peer mentorship program?
    a. who developed the program/why the program being implemented at the rehabilitation center/how/why the collaboration between the community-based SCI organization and the rehabilitation center was initiated?
    b. How did your team get involved in the rehabilitation center? (e.g., is there an official agreement?)
    c. How does the community-based SCI organization integrate the mentors into the rehabilitation center?
    d. What is the decision-making process if the program needs changes?
    e. How do you describe this collaboration between the community-based SCI organization and the rehabilitation center?

4. What are the factors/things that influence the peer mentorship program?
    a. What barriers/challenges has the community-based SCI organization faced to deliver this peer mentorship program?
    b. What supports the role of mentors at the rehabilitation center?

5. What are your lesson learned from delivering the peer mentorship program?
    a. What recommendations do you have to hospitals and rehabilitation centers that aim to integrate a SCI peer mentorship program?

Appendix 4.B - COnsolidated criteria for REporting Qualitative Research (COREQ) Checklist

A checklist of items that should be included in reports of qualitative research. You must report the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

Topic	Item No.	Guide Questions/Description	Reported on Page No.
Domain 1: Research team and reflexivity			
Personal characteristics			
Interviewer/facilitator	1	Which author/s conducted the interview or focus group?	3
Credentials	2	What were the researcher's credentials? E.g. PhD, MD	2
Occupation	3	What was their occupation at the time of the study?	2
Gender	4	Was the researcher male or female?	N/A
Experience and training	5	What experience or training did the researcher have?	2
Relationship with participants			
Relationship established	6	Was a relationship established prior to study commencement?	3
Participant knowledge of the interviewer	7	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	3
Interviewer characteristics	8	What characteristics were reported about the inter viewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	3
Domain 2: Study design			
Theoretical framework			
Methodological orientation and Theory	9	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	2
Participant selection			
Sampling	10	How were participants selected? e.g. purposive, convenience, consecutive, snowball	3
Method of approach	11	How were participants approached? e.g. face-to-face, telephone, mail, email	3
Sample size	12	How many participants were in the study?	3

Non-participation	13	How many people refused to participate or dropped out? Reasons?	N/A
Setting			
Setting of data collection	14	Where was the data collected? e.g. home, clinic, workplace	3
Presence of non-participants	15	Was anyone else present besides the participants and researchers?	3
Description of sample	16	What are the important characteristics of the sample? e.g. demographic data, date	3
Data collection			
Interview guide	17	Were questions, prompts, guides provided by the authors? Was it pilot tested?	3
Repeat interviews	18	Were repeat inter views carried out? If yes, how many?	N/A
Audio/visual recording	19	Did the research use audio or visual recording to collect the data?	3
Field notes	20	Were field notes made during and/or after the inter view or focus group?	N/A
Duration	21	What was the duration of the inter views or focus group?	3
Data saturation	22	Was data saturation discussed?	N/A
Transcripts returned	23	Were transcripts returned to participants for comment and/or correction?	N/A
Domain 3: analysis and findings			
Data analysis			
Number of data coders	24	How many data coders coded the data?	3
Description of the coding tree	25	Did authors provide a description of the coding tree?	4
Derivation of themes	26	Were themes identified in advance or derived from the data?	3
Software	27	What software, if applicable, was used to manage the data?	3
Participant checking	28	Did participants provide feedback on the findings?	N/A
Reporting			
Quotations presented	29	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	4-6
Data and findings consistent	30	Was there consistency between the data presented and the findings?	4-6
Clarity of major themes	31	Were major themes clearly presented in the findings?	4-6
Clarity of minor themes	32	Is there a description of diverse cases or discussion of minor themes?	4-6

*Note: the page numbers in the table were according to the journal manuscript.

Developed from: Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

Appendix 5.A - Interview Guide

Interview #1: Getting to know the participants

Pre-interview Routine (Interview #1 only):

- Involvement in Future Studies ☐
- Honorarium Form ☐
- Screening/Demographic Questions ☐

1. Tell me about your family, where you grew up, and where you currently live
2. How would your friends/family describe you?
3. Describe some of your favorite hobbies/activities
4. Walk me through a typical day for you
5. Who are the people most important to you?
6. Describe (if you want) your transition from the hospital or rehabilitation center to your home
7. Would you like to add anything else related to our interview?
    - Do you have any comments or questions?
    - Schedule time/date for Interview #2 and briefly describe the topic that will be discussed

Interview #2: Understanding Peer Mentorship

Pre-interview Routine:

- Debrief Interview #1
- Add/clarify comments based on previous discussion
- Outline the focus for Interview #2

1. Why/How did you get involved in peer mentorship?
2. How does peer mentorship work?
3. Why do you think peer mentorship is important?
4. In what ways has peer mentorship helped you?
5. In what ways do you think the peer mentorship process could have been more helpful? What are some things you wish you could have gotten out of peer mentorship?
6. Describe your relationship with _____, as a peer mentor.
7. Would you like to add anything else related to our interview?
    - Do you have any comments or questions?
    - Schedule time/date for Interview #3

Interview #3: Understanding the Dyad's Experience

Pre-interview Routine:

- Debrief Interview #2
- Add/clarify comments based on previous discussion
- Outline the focus for Interview #3

1. Why was _____ such a good peer mentorship partner for you?
2. Describe a time/experience when your relationship was particularly strong?
3. What makes for a strong peer mentor relationship?
4. What is the single most important thing that peer mentorship has done for you?
5. What needs to be done to improve peer mentorship?
6. Would you like to add anything else related to our interview?
    - Do you have any comments or questions?

Tables

Table 3.1– Description of the Two Rehabilitation Hospitals

	Chinese hospital	**Canadian hospital**
Location	City of Tianjin	Suburban Montréal
Regional population	16 million	440 thousand
Language spoken	Mandarin	English and French
Organizational characteristic	One of the largest hospitals characterized by orthopedics and rehabilitation medicine in northeast China	Regional center in physical rehabilitation
Department/Unit	Rehabilitation Medicine Department	Trauma and Neuro unit
Staff size	About 80	About 20
Type of rehabilitation service	Inpatient-focused	Outpatient-focused
Type of Patient	Acute phase of SCI	Community-dwelling

Note: Both hospitals provide a comprehensive range of rehabilitation services to individuals with various health conditions, including SCI.

Table 3.2 - Participant Information

Department/Unit		Chinese Hospital Rehabilitation Medicine Department	Canadian Hospital Trauma unit	Canadian Hospital Neuro unit
Participants (n)		10	5	9
Gender (n)	Female	6	3	8
	Male	4	2	1
Occupation (n)	Doctors	3	0	0
	Nurse	2	0	0
	Physiotherapist	4	2	3
	Occupational Therapist	1	0	4
	Social Worker	0	0	1
	Psychologist	0	1	0
	Kinesiologist	0	1	0
	Coordinator	0	1	1
Years of experience	1-5	2	0	3
	6-10	4	0	0
	11-20	3	1	4
	20+	1	4	2

Table 3.3 - Participant Quotes

CFIR constructs	Quote number	Quotes
Engaging innovation recipients (patients with SCI)	1	The approach has to be, I hope it's the right word, non-threatening. We had a program at one point with the stroke patients, it was called: The coffee meeting. Former stroke patients would come and speak about their experience to a group of people, and literally we would serve coffee and cookies to the people attending. It was very non-threatening, very informal. It was just the way of opening up the discussion and seeing what's out there. (Participant from the Neuro unit of the Canadian hospital)
	2*	Some time ago there were two patients with very similar conditions. One came in with a very strong motivation of being independent because he is a young man who suffered a lot financially. He wanted to recover in the shortest possible time, and then to go to work. His rehabilitation process with us was no longer than two months, while he had great outcomes. Before he was discharged, we received the other patient with similar conditions. The first patient often talked to and encouraged the second one who was very anxious at first. The first patient told him: "I went through a lot of things you are experiencing right now. You might encounter different issues later, such as… However, you could end up having the same outcome eventually". I feel like these words made a big difference on that person. (Participant from the Rehabilitation Medicine Department of the Chinese hospital)
	3*	In terms of selecting the patients for this peer mentorship program, we are not going to say all of them will do it. We may just start with the ones who are easy to get along with. Many patients are in the acute phase of their SCI. They tend to be in denial of their condition and not willing to talk to others. (Participant from the Rehabilitation Medicine Department of the Chinese hospital)
Engaging innovation deliverers (health professionals):	4*	[To organize a peer mentorship program], we may need to coordinate the time for those interactions and events. Every patient has a lot of treatment sessions per day. We need to spend some time coordinating the schedule of their treatments so that we can have patients with the same conditions show up together. (Participant from the Rehabilitation Medicine Department of the Chinese hospital)
	5	As much as I'm the type of clinician where I tried to be very approachable, I'm scared that my presence would

		limit the conversation. You know, I want them to feel like they're [patients] talking to somebody who they can ask any question to and just have an open discussion. And then if there's something that they want to give me as information later on, I'm there. (Participant from the Neuro unit of the Canadian hospital)
	6	"We notice there's a lot of mental health issues in neurology, so you have to be sure that the mentor is well equipped to deal with that and handle the situation. We also have to do a little bit of supervision in terms of how the interaction is going [between mentors and mentees] because it can go really, really well, but can also go in a different way." (Participant from the Neuro unit of the Canadian hospital)
Implementation team members	7	I know that we [the Neuro unit] went once to [another local rehabilitation hospital] because we had a lot of questions for them and we could meet the whole team there… We could just reach out to them and see how they do it with the mentor, and also ask the mentor like, 'who are they and what can they offer us?', because I'm sure they've seen a lot as mentors on what their specialty or their role in our team would be. (Participant from the Neuro unit of the Canadian hospital)
	8*	If you just try to educate our health professionals [about peer mentorship]… first, they may not have time. Also, people might just not take it seriously. However, if you started a little bit of something [a pilot program] and have patients tell us about their experience, we [health professionals] would believe that it might be meaningful to do. (Participant from the Rehabilitation Medicine Department of the Chinese hospital)
	9*	You really need to have people who have time to do it [implementing a peer mentorship program]. If I have a lot of work every day, a lot of patients waiting for you to serve them, I would like to do it [peer mentorship], but I really don't have time. We need to focus on our clinical work first. We know peer mentorship is a very good idea, it's good and helpful for our patients. However, it may not be appropriate to say this… it [peer mentorship] is the icing on the cake. What we need to do is delivering the charcoal in the snow before we can do the icing on the cake. (Participant from the Rehabilitation Medicine Department of the Chinese hospital)

	10	We [health professionals] don't have a lot of time during the day to sit down and do the PowerPoint presentation and stuff like that. If we were to have time off to do it and with a big committee that would divide [the work], that's one way. (Participant from the Neuro unit of the Canadian hospital)
	11*	Now, no matter it's the nurse, doctor, or therapist, all of them are very occupied with their work. If we want to start a peer mentorship program, we can choose someone from the team. They could be any of the three roles. I believe we have to pick 1 to 2 staff to focus on implementing this program. Everyone from rest of the team still needs to participate, but maybe they could only help a little bit but not be able to follow up with the whole process. (Participant from the Rehabilitation Medicine Department of the Chinese hospital)
High-level leaders	12	I agree that it's [implementing a peer mentorship program] time-consuming, so I think our supervisor needs to understand that it does take time for us. But I think the upper level is very supportive to this approach, trying to get people in the community. (Participant from the Trauma unit of the Canadian hospital)
	13*	The leaders need to look at it from a higher level, trying to see if they can find someone to do it [implementing a peer mentorship program]. (Participant from the Rehabilitation Medicine Department of the Chinese hospital)
Culture	14	I think the [rehabilitation hospital] has a very positive workplace culture where people are very open, collaborative, and patient-centered. I think all of those are facilitators towards implementing something like this [peer mentorship]. (Participant from the Neuro unit of the Canadian hospital)
Work Infrastructure	15*	Regarding the patient turnover, they have to be discharged or getting readmission within 21 days. Some health professionals thus prefer to give the treatments that are simple and fast. Let's say, a patient with SCI came here, we as therapists, want to make a long-term treatment plan and help this patient achieve good outcomes, such as better motor functions and quality of life. However, the hospital requires this turnover rate, as well as the doctors don't want to spend such a long time on this one patient. Then, maybe the rehab process is only a couple of months, but the patient is asked to be discharged. (Participant from the Rehabilitation Medicine Department of the Chinese hospital)

	16*	The communication between the therapists is little because we are in four different teams. Every team has a small number of patients with SCI. It's even less for every therapist. We tend to encourage patients with SCI to talk to patients with other conditions. When two patients talk, they definitely talk about their treatments. Some patients may question: "why you can do this [treatment], but I cannot? (Participant from the Rehabilitation Medicine Department of the Chinese hospital)
	17	We have a shared space, so trauma and neuro [teams] are all in the same area, like the gym workspace with different rooms and equipment and so on. There's a variety of different programs working [going on] together but we had to split outpatients and inpatients because of COVID. (Participant from the Neuro unit of the Canadian hospital)
Partnerships & Connections	18	If they [the community-based organization] were more present in the hospital on a regular basis, I think maybe we would have more people willing to participate in the activities with [the community-based organization] and the peers. If there's some needs, they [patients] can call us, but they can also call [the community-based organization] from there and get some support from the people that have their conditions so that it could help them. (Participant from the Trauma unit of the Canadian hospital)
	19	Having [the community-based organization] on board seems to be essential because we won't be able to find a mentor in our little group of spinal cord injury patients. (Participant from the Trauma unit of the Canadian hospital)
	20	What is the program? What is the goal? Who are the mentors? I think we need to define more specifically, and then we can explain it to the patient when it's in place, we can explain to the patient and explain why it would be the goal for them and how they could benefit from such a program. (Participant from the Trauma unit of the Canadian hospital)
	21*	When we are doing this thing [peer mentorship program], we need to first find a target patient. Ideally, this patient could comprehend and follow the advices from the health professionals very well. Once we find this patient, we could offer this patient a bit more guidance and let them influence the other patients with that knowledge. We will also need to pick the target patient who has ability to explain things and communicate well with others. (Participant from the Rehabilitation Medicine Department of the Chinese hospital)

**Note: Ten quotes were translated from Chinese into English*.

Table 5.1 - Summary of the Narrative Themes

Level-1 theme	Level-2 theme	Level-3 theme
Personal Background	SCI-related information* Family & marital status* Hobbies* Education & career* Personality* Important others* Daily routine* General life experience*	
Peer Mentorship	Mentor-mentee relationship	The first interaction* Mentee autonomy* Mentee-centered approach* Gender impact* Trust & Respect* Friendship-mentorship boundary*
	Mentor's qualities	Empathetic understanding Open-minded Authentic Willing to share* Listening skills* Work ethics
	Mentee's qualities	Acceptance Readiness to mentorship*
	Mentorship modality*	
	Impact of mentorship	Informational & practical support Emotional support Support mentee's family
	Improve mentorship	Support for mentors* Accessibility Personal space for mentee*

Note: *Themes selected as story plots

Figures

Figure 3.1 – Barriers and Facilitators across the Two Cases

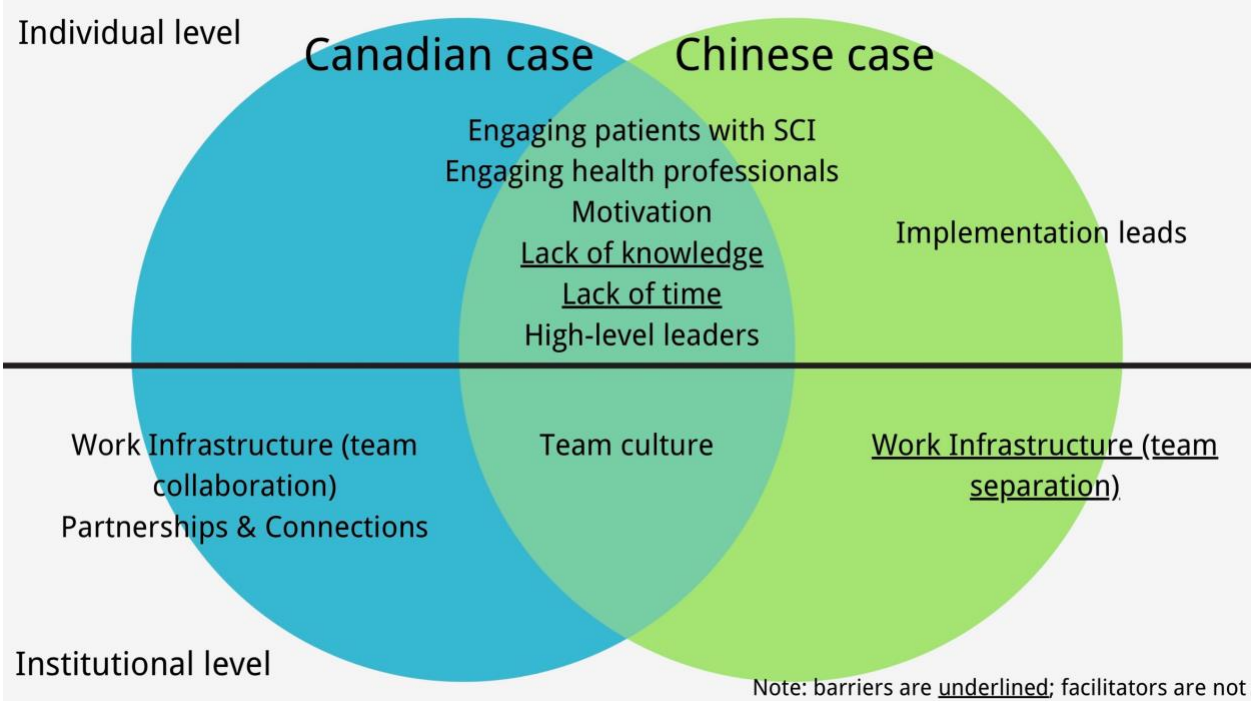
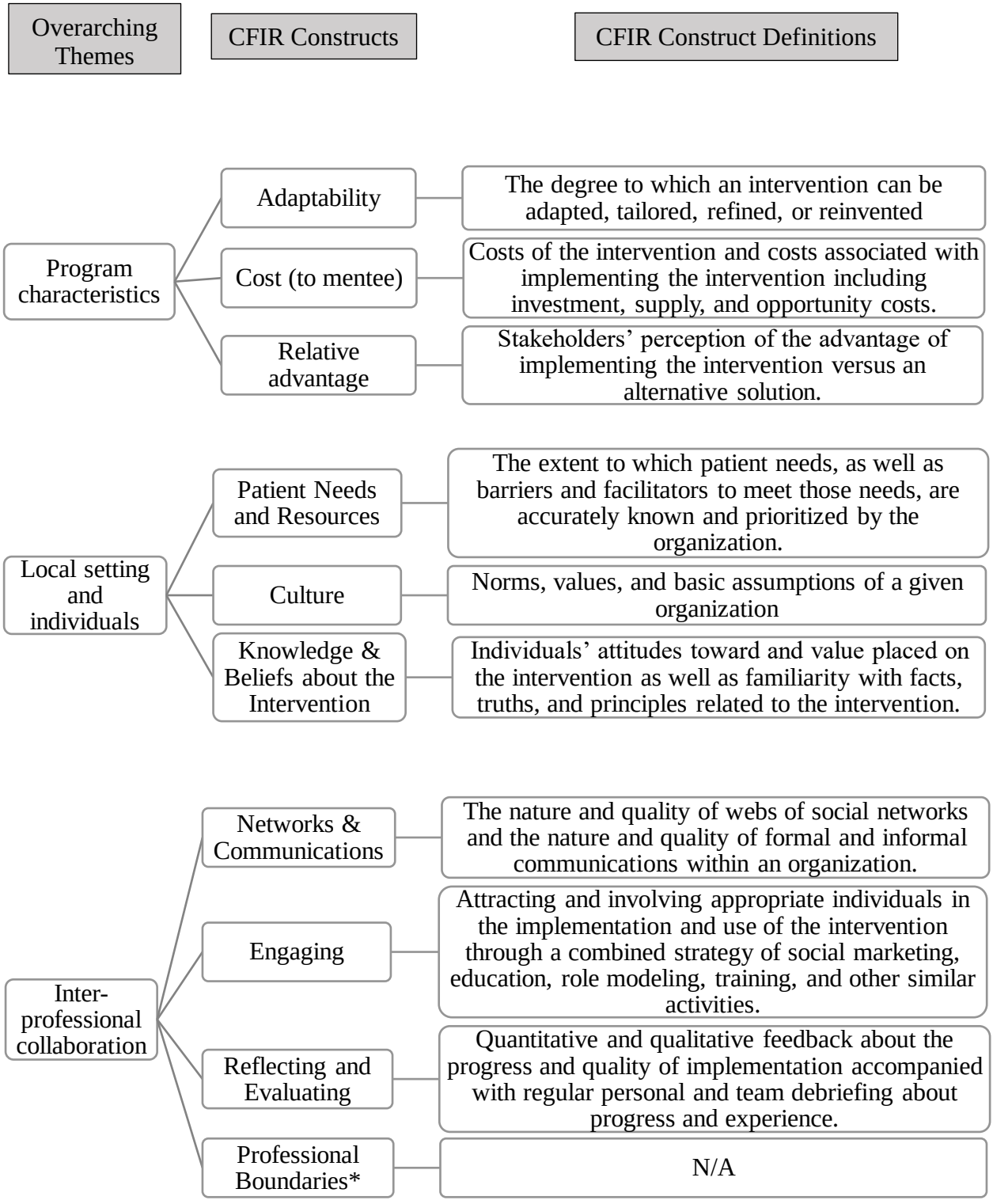


Figure 4.1 - Overarching Themes and CFIR Constructs with its Definition



*Inductive themes identified

Figure 5.1 - Comic Script Showcasing Story 2