Physical Education, Health and Social Sciences

https://journal-of-social-education.org

E-ISSN: 2958-5996
P-ISSN: 2958-5988

Relationship Between Health Literacy and Self-Management of Neurogenic Bladder in Spinal Cord Injury Patients

Muhammad Imran [1], Afrooz Bibi [2], Dr. Muhammad Anwar [3], Dr. Naheed Akhtar [4], Dr. Shah Hussain [5]

[1] MSN - Head Nurse, Emergency Department, DHQ Hospital Daggar Buner.
[2] MSN - Assistant Professor - Khyber Medical University, IHS Islamabad.
[3] PhD, MSN Principal/Assistant Professor, Medtec College of Nursing, KPK
[4] PhD, MSN Principal/Assistant Professor, Nursing Department, Sina Institute of Nursing & Allied Health Science.
[5] PhD, MSN Principal/Assistant Professor, Zalan College of Nursing, Swat.
Correspondence Author Muhammad Imran Email: mimrankhan63@gmail.com

DOI: https://doi.org/10.63163/jpehss.v3i2.339

Abstract

Background: Neurogenic bladder is a common complication arising as a consequence of spinal cord injury (SCI), which affects people in problematic self-care practices. Health literacy is critical for patients to understand and control their condition properly. Research exploring this link is yet to be conducted in Pakistan.

Aim: This study aimed to examine the relationship between health literacy and self-management of neurogenic bladder among adult spinal cord injury patients at Saidu Teaching Hospital, Swat.

Methods: The correlational research design was employed, and 100 adult SCI patients with neurogenic bladder were purposively selected as participants. Data was collected using a structured questionnaire with three sections: < knowledge level, as demonstrated, the adapted Health Literacy Questionnaire (HLQ), and the validated Self-Management Scale for Neurogenic Bladder. Participants were directly interviewed, and the gathered data were analyzed in SPSS version 25. The correlation between health literacy and self-management was formulated using Pearson's correlation test.

Results: The mean age across participants was 42.5 years (SD ± 11.6), and 63% were male. The participant's overall health literacy was 6.8 ± 1.6, with a mean self-management score of 7.1 ± 1.4. There was a positive and significant relationship between each facet of health literacy and self-management; overall health literacy demonstrated the highest correlation ($r = 0.61$, $p < 0.001$).

Conclusion: The study results confirm that improved health literacy promotes better self-management of neurogenic bladder in persons with SCI. More emphasis on health literacy through specialized educational interventions may increase long-term outcomes for patients.

Keywords: Spinal cord injury, neurogenic bladder, health literacy, self-management, and patient education.

Introduction

Health literacy refers to the individual's ability to obtain, understand, and apply health information for supporting decision-making and treatment compliance (van der Gaag et al., 2022). Self-management entails taking direct interest in the process of symptom control and staying true to treatment, developing a new way of living, and resolving psychological and

social issues associated with a chronic illness (McKenna et al., 2020). Neurogenic bladder is defined by urinary bladder dysfunction caused by nerve damage, with the most common symptoms being retention or incontinence. Spinal cord injury (SCI) is a crippling condition that disrupts the link between the brain and the body, leading to neurogenic bladder as well as other health conditions. Understanding the connection between health literacy and self-management is crucial in improving the quality of life of people with such conditions (Valbuena Valecillos et al., 2022).

The spinal cord injury is encountered on an annual basis, between 250,000 and 500,000 individuals globally, and neurogenic bladder is experienced by about 80% of individuals with such injuries (Bwengi, 2023). In areas of low income, the prevalence rises because of a deficit of rehabilitation resources. SCI cases have escalated in Pakistan, with a significant number of causes emanating from accidents, falls, and violent acts, and a substantial percentage of the patients have a neurogenic bladder as a sequel to the condition following injury (Akter, 2023). The high prevalence of neurogenic bladder is frequently hidden under widespread underdiagnosis and poor treatment due to the lack of education and awareness, as well as follow-up, among those with limited health literacy (Panicker, 2020).

Care for a neurogenic bladder requires continued detailed treatment. The process involves continued catheterization, controlling fluid and protecting against infections, and, when needed, going for surgery (Redboy, 2023). The patients must live with their conditions well to reduce the risks of recurrent urinary tract infections, which can affect their kidneys and social lives. However, these activities require health literacy since patients must read medical guidelines, identify signs, and engage fully with healthcare professionals. A lack of adequate health literacy may place patients at risk of mismanagement and unnecessary complications (Pelliccioni et al., 2023).

High levels of health literacy in patients are instrumental in freeing them to make decisions regarding their treatments and enabling them to comply with bladder management practices (Ko, 2023). People with higher health literacy are more capable of practicing preventative mechanisms, obtaining the appropriate care, and assessing their health outcomes (Peltzer et al., 2020). However, patients who lack health literacy face such issues as misreading directions, neglecting prescribed therapeutic actions, and avoiding health care providers, which may lead to worse overall health. Patients with a neurogenic bladder after spinal cord injury report rather significant changes in their self-efficacy and self-care models, given the diverse health literacy (Virlée et al., 2020).

While healthcare systems increasingly put more emphasis on patient-centered care, there is not much emphasis on measuring and improving the basic skills of health literacy, especially for people living with complex chronic diseases (Butayeva et al., 2023). More evidence is being reported that health literacy is critical in supporting self-management among patients with diabetes, hypertension, and asthma (Dahal & Hosseinzadeh, 2020). Even more interestingly, far less attention has been given to neurogenic bladder management challenges experienced by SCI patients. This study aims to fill that gap by examining the relationship between health literacy and the effectiveness of self-management of SCI patients' bladder dysfunction (Guo et al., 2021).

In the case of countries like Pakistan, cultural, educational, and socio-economic differences are many and can have as much influence on patients' health literacy as comprehensive health education cannot be readily available. A high percentage of patients rely on family caregivers who tend to have low levels of health knowledge that may affect self-management as a positive behavior (Kim et al., 2020). These difficulties include communication barriers, maintaining traditional thought, and weaknesses in the health system, making educating and engaging patients harder. Studying health literacy in such settings is critical to developing culturally sensitive interventions that allow patients to manage their conditions better and free up healthcare resources (Shahzad et al., 2024).

Because neurogenic bladder is a chronic disease and self-care is essential to its management, self-management is associated with the level of health literacy; therefore, it becomes necessary to study the association between self-management and health literacy. This research aims to determine health literacy among individuals with spinal cord injury and neurogenic bladder and how it affects their self-management ability. The outcomes from this study will guide the creation of individually-tailored educational campaigns and interventions to improve patient outcomes, reduce health care costs, and support quality of life for persons with spinal cord injury and neurogenic bladder.

Methodology

This study employed a correlational research design to examine the relationships between health literacy and self-management of neurogenic bladder in adults with spinal cord injury (SCI) to measure the direction and magnitude of the relationship without intervening. The study at Saidu Teaching Hospital, Swat, an SCI rehabilitation center, focused on patients under treatment in the urology and rehabilitation departments. The study targeted adults over 18 years old who had SCI and neurogenic bladder, while excluding those with severe cognitive impairments or psychiatric disorders that could interfere with the quality of the collected data. Using non-probability purposive sampling, 100 qualified participants were recruited from both hospital and outpatient settings, with emphasis on the use of self-managing catheterization and bladder hygiene routines. Data was collected in the hospital using review of clinical records and structured interviews to measure health literacy and monitor self-management behaviors. Due to the nature of the study, an exploration of the role of health literacy in the effective management of the neurogenic bladders among those who require continued, ongoing care methods was possible. Ethics committees gave their wishes, and privacy was guaranteed for each participant.

Data collection procedure

After approval from the IRB at Saidu Teaching Hospital, data were collected from January to March 2025. Before the study, written informed consent was obtained from each participant. Credentialed interviewers conducted private, face-to-face interviews to provide comfort and security for participants and ensure the integrity of the assembled data.

Three different segments were included in a properly structured questionnaire.

Demographic and Clinical Profile: Information was collected on age, gender, level of education, time from injury, and how they cope with their bladder.

Health Literacy Assessment: To assess participants' functional, communicative, and critical health literacy, an adapted and translated version of the Health Literacy Questionnaire (HLQ) into the local language was used.

Self-Management Scale for Neurogenic Bladder: Built based on standards as defined by clinical protocols and supported by peer-reviewed literature, this scale measured how patients regulated bladder emptying, monitored infections, regulated hydration, and managed complications.

Before using them in the main study, the two measurement tools were evaluated for clarity and reliability.

Data Analysis Procedure

All the data were analyzed using the version 25 SPSS software. Measures of central tendency – means (together with standard deviations, frequencies, and percentages were adopted to package the demographic data and variable distributions. Utilizing the Pearson correlation coefficient (r), we analyzed the matrix correlating health literacy with self-management scores to determine strength and direction. At a p-value of less than 0.05, statistically significant findings were observed.

Results and Analysis

Demographic Characteristics of Participants

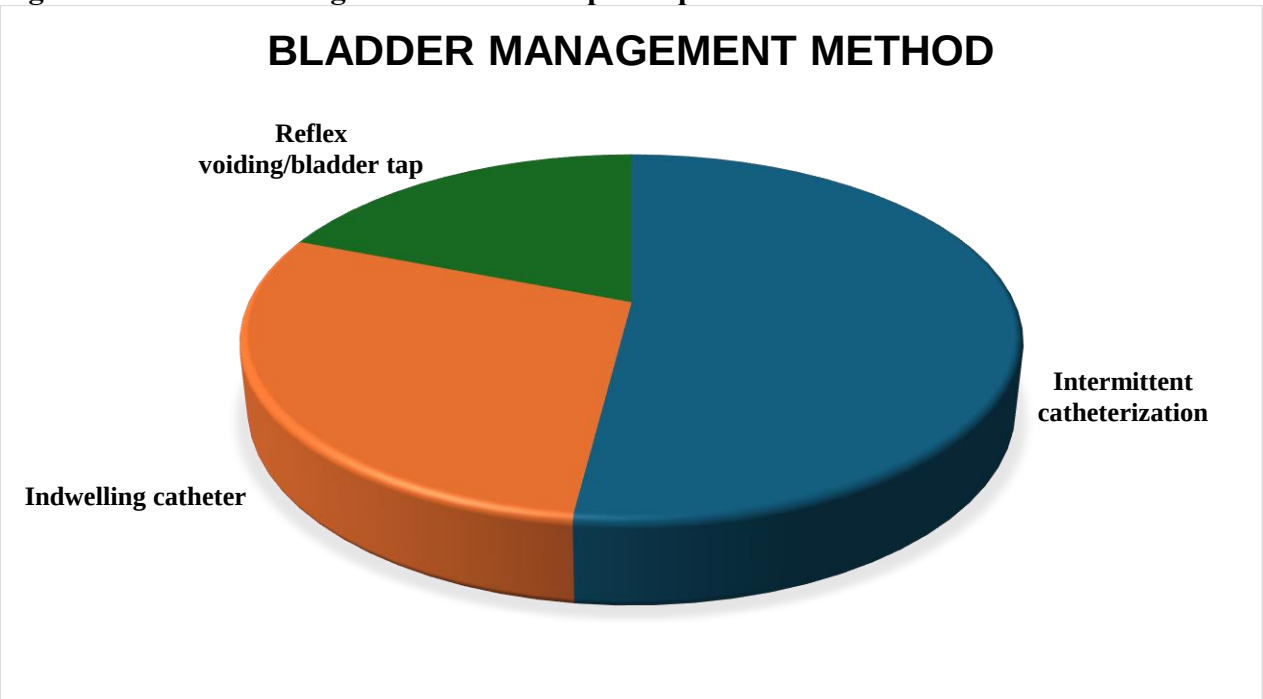
There were 100 participants, averaging 42.5 y (±11.6), of whom 63% were male. While some respondents lacked formal education, making up 22% of the group, 26% of the respondents are higher educated. Spinal cord injury in the past 1 to 3 years was reported by about 44% of participants. Regarding the group, intermittent catheterization was the most often used method for bladder management (52%). The diverse age ranges, sexes, and duration of injuries among the participants diversified the comprehension of variations in self-management practices (Table 1)

Table 1: Demographic Characteristics of Participants (n = 100)

Variable	Category	Frequency (%)
Age (years)	Mean ± SD = 42.5 ± 11.6	
Gender	Male	63 (63%)
	Female	37 (37%)
Level of Education	No formal education	22 (22%)
	Primary	18 (18%)
	Secondary	34 (34%)
	Higher (college/university)	26 (26%)
Time Since Injury	< 1 year	19 (19%)
	1–3 years	44 (44%)
	> 3 years	37 (37%)
Bladder Management Method	Intermittent catheterization	52 (52%)
	Indwelling catheter	29 (29%)
	Reflex voiding/bladder tap	19 (19%)

Most participants (52%) managed their bladder using intermittent catheterization, followed by 29% with indwelling catheters, and 19% relying on reflex voiding or bladder tapping. This indicates a preference for self-managed bladder care among the study group (Figure 1).

Figure 1: Bladder Management Method of participants



Low health literacy was demonstrated among the participants, with an average functional health literacy of 7.4 ± 1.5 and an average critical health literacy of 6.2 ± 1.8. Communicative

health literacy added, with a rather average of 6.8 ± 1.7, which added along with other measures to an overall health literacy scale score of 6.8 ± 1.6. The self-management scale's mean value of 7.1 ± 1.4 indicates that the participants managed their health well. Personal responses were varied as reflected in the score achieved (Table 2)

Table 2: Descriptive Statistics for Health Literacy and Self-Management Scores

Variable	Mean ± SD	Min – Max
Functional Health Literacy	7.4 ± 1.5	4 – 10
Communicative Health Literacy	6.8 ± 1.7	3 – 10
Critical Health Literacy	6.2 ± 1.8	2 – 10
Overall Health Literacy Score	6.8 ± 1.6	3.2 – 10
Self-Management Score	7.1 ± 1.4	3.5 – 10

Correlation analysis with Pearson indicated that all components of health literacy had significant and positive correlations with self-management skills among spinal cord injury individuals with neurogenic bladder. Moderate positive correlations were evidenced between both functional and communicative health literacy and their self-management behavior ($r = 0.58$, $p < 0.001$, and $r = 0.51$, $p < 0.001$, respectively). This was a weaker but still statistically significant association ($r = 0.43$, $p < 0.001$) with self-management and critical health literacy. Self-management was the best predictor of general health literacy in patients ($r = 0.61$, $p < 0.001$), meaning that individuals with superior general health literacy were more capable of managing their bladder effectively. (Table 3).

Table 3: Correlation Between Health Literacy and Self-Management (Pearson's r)

Variable Pair	Pearson's r	p-value	Interpretation
Functional Health Literacy vs. Self-Management	0.58	< 0.001	Moderate positive correlation
Communicative Health Literacy vs. Self-Management	0.51	< 0.001	Moderate positive correlation
Critical Health Literacy vs. Self-Management	0.43	< 0.001	Weak-to-moderate positive correlation
Overall, Health Literacy vs. Self-Management	**0.61**	**< 0.001**	**Strongest correlation observed**

Discussion

Research showed that increased health literacy is closely associated with improved self-management among SCI patients with neurogenic bladder. Specifically, functional, communicative, and critical health literacy were positively associated with self-management activities, and the total health literacy score had the greatest association (Renwick et al., 2024). The study data indicate that people with greater health literacy can better deal with neurogenic bladder's complex, long-term care needs, including catheter usage, fluid consumption, and vigilance for possible infections. This finding supports theoretical models that view health literacy as a key to managing self-care in long-term health conditions (Adil et al., 2021).

We note similarity with the research of Matus (2023), who found that health literacy robustly relates to self-care in diabetes patients, further emphasizing the potential for generalizability of this link across various chronic health states (Ehmann et al., 2021). The association that we see corresponds to the results of prior research emphasizing functional health literacy as a major factor underlying enhanced adherence to treatment plans and behavioral changes. Our study corresponds to past studies conducted by Rees et al. (2021), which demonstrated the importance of patient activation, related to health literacy, for better self-management. Although current investigations have always focused on metabolic or cardiovascular diseases, our study is the first to provide specific findings of urological self-management difficulties among the SCI patients, a relatively unstudied topic.

Meanwhile, Magi et al., (2024) discovered in their study of patients with chronic kidney disease that critical health literacy had a greater impact than functional literacy, meaning that the relative focus of health literacy dimensions might depend on the condition and its self-management requirements. Our study showed that critical health literacy had the lowest correlation strength between the three dimensions, which can be explained by the procedural requirement of bladder management and the urge for functional understanding and provider engagement instead of individual analysis. Such fluctuations indicate that such understanding of health literacy necessitates an approach specific to the peculiarity of clinical situations.

Also, the demographic we saw with so many participants having low levels of education and high percentages dependent on intermittent catheterization forces us to see the actual difficulties to obtaining and managing health information that such patients experience in the real world (Stømer et al., 2020). Our findings support Lovett et al., (2020) findings in which those with lower education levels generally report poorer health literacy and insufficient capacity for self-management. However, our analysis focused on the Pakistani population, adding a valuable cross-cultural perspective to Western research on health literacy.

This research builds on the field by introducing a multidimensional tool of health literacy that has been modified for the language of the local population, thus increasing the relevancy of the tool, as well as its cultural fit. Sørensen et al., 2012 and other previous research have argued that there is need to develop context-specific tools to give a more accurate measure of health literacy in different contexts. By showing good correlations with the adapted measure, our results vindicate the demand for more context-specific tools in health care settings.

Although the aspect of sampling and trusted data acquisition methods are in the focus of the present study, it is essential to note that some restrictions are still applicable. Non-probability purposive sampling that will be used for our application may impact the generalizability of our findings, and self-reporting may also confer response bias. Moreover, the cross-sectional approach does not allow drawing any conclusion about the causal relationship between health literacy and self-management. However, the similarity of our findings to those obtained in other research supports the hypothesis that improving health literacy may be a meaningful strategy for improved bladder management in SCI patients.

Conclusion and Recommendations

The study aimed to explain the linkage of health literacy with self-management of a neurogenic bladder in SCI patients at Saidu Teaching Hospital, Swat. Strong positive relations existed between the ability to employ self-management practices and functional, communicative, and critical health literacy. Better-equipped bladder care management was a habit of patients who were more literate about their overall health. Health literacy is emphasized in the study as the key to SCI patients' active involvement in their continued care, especially in managing the challenges of neurogenic bladder.

According to these results, the following important recommendations may be offered. First, healthcare providers and rehabilitation teams need to conduct health literacy assessments as part of patient evaluations to identify patients who require additional assistance or individualized education. Second, patient literacy standards and cultural diversity require modification of health education materials and communication techniques. To improve accessibility, learning materials need to be translated into dialects and accompanied by diagrams or examples to help patients understand and perform tasks such as catheterization.

Third, organized educational efforts focused on bladder self-management should be implemented into rehabilitation with an emphasis on functional and communicative literacy. Fourth, teamwork by nurses, urologists, physiotherapists, and health educators can ensure consistent support of self-management strategies throughout the phases of therapy.

Furthermore, the adoption of longitudinal and interventionist strategies in future research will clarify whether health literacy training results in improved self-care capacities and a decline in complications (such as urinary tract infections or hospital re-admissions). Policymakers and

hospital administrators must realize the effects of health literacy on long-term care and offer them resources to ensure flexible, patient-oriented literacy programs. Addressing health literacy is both necessary for education and for better outcomes and more independence for those with spinal cord injury.

References

Adil, A., Usman, A., & Jalil, A. (2021). Qualitative analysis of digital health literacy among university students in Pakistan. Journal of Human Behavior in the Social Environment, 31(6), 771-781.

Akter, J. (2023). Perception about life challenges in patients with spinal cord injury (Doctoral dissertation, Bangladesh Health Professions Institute, Faculty of Medicine, the University of Dhaka, Bangladesh).

Bwengi, E. M. (2023). Prevalence, Causative Organisms and Risk Factors for Urinary Tract Infections in Spinal Cord-Injured Patients (Doctoral dissertation, University of Nairobi).

Butayeva, J., Ratan, Z. A., Downie, S., & Hosseinzadeh, H. (2023). The impact of health literacy interventions on glycemic control and self-management outcomes among type 2 diabetes mellitus: A systematic review. Journal of diabetes, 15(9), 724-735.

Dahal, P. K., & Hosseinzadeh, H. (2020). Association of health literacy and diabetes self-management: a systematic review. Australian journal of primary health, 25(6), 526-533.

Ehmann, A. T., Ög, E., Rieger, M. A., & Siegel, A. (2021). Work-related health literacy: a scoping review to clarify the concept. International Journal of Environmental Research and Public Health, 18(19), 9945.

Faiola, A., Kamel Boulos, M. N., Bin Naeem, S., & Ur-Rehman, A. (2022). Integrating social and family support as a measure of health outcomes: validity implications from the integrated model of health literacy. International Journal of Environmental Research and Public Health, 20(1), 729.

Guo, X. M., Zhai, X., & Hou, B. R. (2021). Adequacy of health literacy and its effect on diabetes self-management: a meta-analysis. Australian journal of primary health, 26(6), 458-465.

Kim, S., Song, Y., Park, J., & Utz, S. (2020). Patients' experiences of diabetes self-management education according to health-literacy levels. Clinical nursing research, 29(5), 285-292.

Ko, H. Y. (2023). Managing Neurogenic Lower Urinary Tract Dysfunction in Spinal Cord Injuries. In A Practical Guide to Care of Spinal Cord Injuries: Clinical Questions and Answers (pp. 519-558). Singapore: Springer Nature Singapore.

Lovett, R. M., Curtis, L. M., Persell, S. D., Griffith, J. W., Cobia, D., Federman, A., & Wolf, M. S. (2020). Cognitive impairment no dementia and associations with health literacy, self-management skills, and functional health status. Patient education and counseling, 103(9), 1805-1811.

Magi, C. E., Bambi, S., Rasero, L., Longobucco, Y., El Aoufy, K., Amato, C., ... & Iovino, P. (2024, March). Health literacy and self-care in patients with chronic illness: a systematic review and meta-analysis protocol. In Healthcare (Vol. 12, No. 7, p. 762). MDPI.

Matus, A. (2023). A Mixed Methods Investigation of Attitudes and Self-Care in Individuals With Type-1 Diabetes Mellitus and Impaired Awareness of Hypoglycemia (Doctoral dissertation, University of Pennsylvania).

McKenna, V. B., Sixsmith, J., & Barry, M. (2020). Facilitators and barriers to the development of health literacy capacities over time for self-management. HLRP: Health Literacy Research and Practice, 4(2), e104-e118.

Panicker, J. N. (2020, October). Neurogenic bladder: epidemiology, diagnosis, and management. In Seminars in neurology (Vol. 40, No. 05, pp. 569-579). Thieme Medical Publishers, Inc..

Pelliccioni, G., Castellani, D., Rocchi, C., Cameriere, V., Sabbatini, D., & Pelliccioni, P. (2023). Pathophysiology, Clinical Presentation and Management of Neurogenic Bladder. In Autonomic Disorders in Clinical Practice (pp. 257-282). Cham: Springer International Publishing.

Peltzer, S., Hellstern, M., Genske, A., Jünger, S., Woopen, C., & Albus, C. (2020). Health literacy in persons at risk of and patients with coronary heart disease: a systematic review. Social science & medicine, 245, 112711.

Redboy, S. (2023). Educational Material for Nurses in Managing Patients with Neurogenic Bladder. Walden University.

Rees, J., Tuijt, R., Burton, A., Walters, K., & Cooper, C. (2021). Supporting self-care of long-term conditions in people with dementia: A systematic review. International Journal of Nursing Studies, 116, 103432.

Renwick, L., Pedley, R., Johnson, I., Bell, V., Lovell, K., Bee, P., & Brooks, H. (2024). Mental health literacy in children and adolescents in low-and middle-income countries: a mixed studies systematic review and narrative synthesis. European child & adolescent psychiatry, 33(4), 961-985.

Shahzad, M. A., Akram, R. M. W., Idrees, M., Rubab, M., Raza, M., & Zehra, A. (2024). Socio-economic determinants of low literacy rate in rural areas of Punjab Pakistan. Bulletin of Business and Economics (BBE), 13(1).

Stømer, U. E., Wahl, A. K., Gøransson, L. G., & Urstad, K. H. (2020). Exploring health literacy in patients with chronic kidney disease: a qualitative study. BMC nephrology, 21, 1-9.

Valbuena Valecillos, A. D., Gater Jr, D. R., & Alvarez, G. (2022). Concomitant brain injury and spinal cord injury management strategies: a narrative review. Journal of personalized medicine, 12(7), 1108.

van der Gaag, M., Heijmans, M., Spoiala, C., & Rademakers, J. (2022). The importance of health literacy for self-management: a scoping review of reviews. Chronic illness, 18(2), 234-254.

Virlée, J., Van Riel, A. C., & Hammedi, W. (2020). Health literacy and its effects on well-being: how vulnerable healthcare service users integrate online resources. Journal of Services Marketing, 34(5), 697-715.