



Technologies' Potential And Difficulties In Assisting Family Caregivers Of Patients With Somatoform Diseases

Mr.Prateek Nagpal^{1*}, DR.Rinu Chaturvedi², DR.Rubina Fakhr³

^{1*}Research Scholar, Department of Psychology, School of Liberal and Creative Arts, Lovely Professional University, Phagwara. prateek908@outlook.com

²Assistant Professor, Department of Psychology, School of Liberal and Creative Arts, Lovely Professional University, Phagwara. rinu.28446@lpu.co.in

³Assistant Professor, Department of Psychology, GITAM (Deemed to be University), Hyderabad. rfakhr@gitam.edu

***Corresponding Author:** Mr. Prateek Nagpal

*Research Scholar, Department of Psychology, School of Liberal and Creative Arts, Lovely Professional University, Phagwara. prateek908@outlook.com

Citation: Mr. Prateek Nagpal et al. (2024), "Technologies' Potential and Difficulties in Assisting Family Caregivers of Patients with Somatoform Diseases," *Educational Administration: Theory and Practice*, 30(5), 8379-8387

DOI: 10.53555/kuey.v30i5.4359

ARTICLE INFO

ABSTRACT

Governments now mainly rely on family caregivers (FCs) to take care of patients and lessen the burden placed on official health and social care systems as the world's population ages. The sustainability of family caregivers' unpaid caregiving job has grown to be a critical problem due to mounting demand. This study investigates the care-related career objectives of family caregivers and explains how those goals relate to or do not relate to technology using qualitative data. The research will enlist family caregivers of people with somatoform illnesses via online support networks, community organizations, and medical facilities. To assess changes in psychological distress and quality of life, participants will complete a follow-up evaluation after the intervention period using the same measures used at baseline. Participants will also share their thoughts on the technology-based intervention, focusing on aspects such as perceived usefulness, ease of use, and satisfaction with the components of the intervention. The results of the study supported the hypothesis by demonstrating that family caregivers of patients suffering from somatoform disorders who participated in the technology-based treatment saw improvements in their overall quality of life and a statistically significant drop in psychological distress levels. The results of our case study demonstrate that while technology can help to promote this resilience, its application may be restricted to serving as a middleman between family caregivers and other entities and information.

Introduction

It is noteworthy that the modest number of patients with somatic complaints who visit psychiatrists is not the only group affected; a significantly greater number of patients with somatic symptoms that are not well explained by general medical disorders are seen by physicians of all specialties. Between 25% and 50% of presentations in primary and secondary care are due to these symptoms (Kroenke, 2003). Thus, it is imperative to comprehend the definition of somatoform disorder in light of the current temporal context. Somatoform disorders are a collection of psychiatric diseases marked by the presence of physical symptoms that cannot be entirely explained by medical conditions (What Is Somatic Symptom Disorder?, n.d.). Family caregivers are essential in providing support to individuals with these diagnoses (Sun et al., 2024). Due to the severe and incapacitating nature of the symptoms, which can seriously affect everyday functioning and quality of life, somatoform illnesses frequently present substantial obstacles for both patients and the people who care for them (Nielsen et al., 2024). In addition to navigating the healthcare system and addressing the practical and emotional obstacles associated with the disorder, family caregivers are responsible for handling the complex demands of their loved ones as the primary providers of care and support (Thapa et al., 2024). The responsibilities of being a family caregiver come with rewards (Brown et al., 2009; Cohen et al., 2002; Colantonio et al., 2001; Poulin et al., 2010; Wilson-Genderson et al., 2009) as well as serious drawbacks (Garlo et al., 2010; N. C. Keating et al., 2014; N. Keating & Eales, 2017; Pressler et al., 2009; Schulz & Sherwood, 2008; Sinha, 2013). The negative effects of providing care are well-documented (Bauer & Sousa-Poza, 2015; N. Keating et al., 2019) and include shortened social networks (N. Keating & Eales, 2017), decreased or limited labor force participation (Eldh & Carlsson, 2011), and worsened physical and mental health (Clayton et al., 2014; Gilhooly et al., 2016; Schulz & Sherwood, 2008). Family caregivers find satisfaction in their work and in strengthening their bonds with care recipients. Therefore, it is imperative to comprehend the circumstances surrounding family caregivers in order to assist their family member in recovering and to ensure the improved mental and physical health of family caregivers. Growing attention has been paid in recent years to how technology can help family caregivers of people with a range of physical and mental health issues (Darley et al., 2024). Technology is opening up new ways to improve caregiving experiences, improve access to information and resources, and encourage communication between

caregivers, healthcare providers, and other support networks (Nguyen et al., 2024). Examples of these opportunities include the growth of digital health tools, telemedicine platforms, mobile applications, and online support communities. In short, technology is increasingly being utilized to support caregivers of individuals with medical and psychiatric conditions, offering enhanced caregiving experiences, improved access to resources, and improved communication between caregivers and healthcare professionals. For family caregivers of patients with somatoform disorder, the use of technology and artificial intelligence (AI) tools in therapeutic practice has several advantages. Through the use of AI, caregivers can obtain individualized solutions, lighten their workload, and improve communication with medical specialists. Virtual assistants, health monitoring systems, and smartphone apps are examples of tools that enable caregivers to deliver better care. To be implemented successfully, though, privacy, equity, and usability issues must be resolved. Clinicians are essential in guaranteeing the ethical use of AI, monitoring the well-being of caregivers, and training them (Moussa et al., 2024; Iyer et al., 2024; Jaafari et al., 2023; Gilani et al., 2023; Tantry & Singh, 2016). Notwithstanding the possible advantages, there are particular opportunities and difficulties when using technology in the caregiving process for patients with somatoform disorder (McNeil et al., 2005; O'Connor & LaRue, 2021; Staggers & Thompson, 2002). Due to the nature of somatoform disorder, which is defined by the occurrence of physical symptoms without obvious medical causes, specialized technical solutions that take into account the unique requirements and complexity of this population may be necessary (Kallivayalil & Punnoose, 2010; Mayou et al., 2003). Furthermore, when adopting technology-based therapies for caregivers of individuals with somatoform illnesses, special thought must be given to ethical issues around privacy, confidentiality, and the quality of online information and support (Langarizadeh et al., 2017; Parsons, 2016; White-Williams & Oetjen, 2015) (Gernal et al., 2024; Khan et al., 2023; Tantry & Ali, 2020; Greenberg, 2019; Majeed, 2018a, 2018b; Tantry & Singh, 2017). The purpose of this research is to investigate how family caregivers of people with somatoform disorder can benefit from the use of technology. This paper aims to further our understanding of how technology can be used to improve the well-being of patients and caregivers in the context of somatoform disorders by analyzing the state of technology-enabled interventions, highlighting potential advantages and difficulties, and discussing future directions for research and practice (Sorour et al., 2024; Al Jaghoub et al., 2024; Mainali & Tantry, 2022; Nivetha & Majeed, 2022; Tantry & Singh, 2018).

Theoretical Framework:

The theoretical framework for the study looks at how technology might help family caregivers of patients with somatoform disorder. It does this by drawing on a few pertinent theoretical viewpoints and concepts to direct the design, analysis, and interpretation of the research.

1. Stress and Coping Theory:

Developed by Lazarus and Folkman in 1984, the Stress and Coping Theory offers a theoretical framework for comprehending how people view and react to stressors. This theory holds that people use cognitive appraisal processes to assess stressful circumstances and use coping mechanisms to deal with stressors. When it comes to providing care for people with somatoform disorders, family caregivers may encounter a great deal of stress because of the difficulties in controlling the symptoms and supporting their loved ones. This approach makes it easier to understand how technology-based interventions might improve coping resources and act as coping strategies to reduce stress in caregivers.

2. Technology Acceptance Model (TAM):

Davis (1989) established the TAM, which asserts that users' attitudes and perceptions of technology affect both their desire to use it and their actual behavior when using it. Perceived utility and perceived usability, according to TAM, are important factors in determining the adoption of new technologies. Within the study's framework, TAM offers valuable perspectives on the variables impacting caregivers' adoption and use of technology-driven interventions designed to enhance their position as caregivers. Designing and implementing successful interventions might be influenced by an understanding of caregivers' opinions regarding the utility and usability of technology (Gilani et al., 2024; Farooq & Majeed, 2024; Achumi & Majeed, 2024; Hussein & Tantry, 2022).

3. Social Support Theory:

According to this theory, connections, social networks, and support systems are crucial for reducing the negative effects of stress and enhancing well-being. Social assistance can take several forms for family caregivers of people with somatoform illnesses, such as instrumental, emotional, and informational help. In order to enhance caregivers' social support resources, technology-mediated social support can play a pivotal role in increasing their capacity to handle caregiving challenges and improving overall well-being.

Support platforms, including peer forums or online support groups, can help family caregivers connect with other caregivers, medical experts, and support networks. The investigation of how technology might improve social support networks and lessen the load on caregivers is guided by this hypothesis.

Biopsychosocial Model:

First put forth by Engel in 1977, the Biopsychosocial Model highlights the ways in which biological, psychological, and social elements are intertwined in shaping health and illness. This model highlights the complex interplay between biological stress responses, psychological suffering, and social support dynamics in the setting of somatoform diseases and caregiving. The influence of technology-based interventions on caregiver outcomes, such as stress, psychological well-being, and quality of life, is thoroughly examined by means of a theoretical framework that incorporates biological, psychological, and social components (Vibin & Majeed, 2024; Monika et al., 2023a, 2023b; Kendler & Prescott, 2021; Tantry et al., 2019; Gilani, 2014).

The study intends to provide a thorough understanding of how technology can assist family caregivers of people with somatoform disorders by integrating these theoretical perspectives and clarifying the mechanisms through which technology-based interventions affect caregiver experiences and outcomes. According to the hypothesis, family caregivers who use technology-based therapies will benefit psychologically from lower levels of stress, anxiety, and depression as well as improved psychological well-being overall. According to this hypothesis, the use of technology—such as online support groups, telemedicine consultations, and instructional materials catered to the requirements of caregivers—will improve the mental health outcomes for caregivers. Technology-based interventions may help caregivers better manage the difficulties involved in caring for people with somatoform illnesses by offering them access to knowledge, moti

support, and coping mechanisms (Gambiza et al., 2023; Yachna & Majeed, 2023; Sulthan et al., 2022; King & Hopwood, 2021; Tantry et al., 2018).

Methodology

Participants:

The research will enlist family caregivers of people with somatoform illnesses via online support networks, community organizations, and medical facilities. Those who are primary caregivers for a family member who has been diagnosed with somatoform disorder and are at least 18 years old will meet the inclusion criteria. Informed consent must be given, and caregivers who lack access to computers or smartphones will not be allowed to participate.

Procedure:

• Recruitment:

Somatoform disorder-focused internet forums, support groups, and medical professionals will be used to find possible participants. After distributing recruitment materials and screening candidates for eligibility, interested parties will be contacted.

• Informed Consent:

Those who meet the eligibility requirements will get comprehensive information regarding the goals, methods, risks, and advantages of the study. Prior to their participation in the study, all individuals will provide written informed consent.

• Baseline Assessment:

The baseline assessment, which consists of standardized measures to evaluate technology use, psychological distress, and quality of life, will be completed by the participants. Additionally, demographic data including age, gender, relationship to the person receiving care, and length of time spent providing care will be gathered (Bhardwaj et al., 2023; Sabu et al., 2022; Brown & Barlow, 2022; Tantry & Ahmad, 2019; Majeed, 2019a, 2019b, 2019c; Cacioppo & Patrick, 2018).

• Intervention:

A technology-based intervention created to assist family caregivers of people with somatoform disorders will be made available to participants. Features including telemedicine consultations, educational materials, symptom monitoring tools, peer support forums, and coping mechanisms specifically designed to meet the requirements of caregivers in this demographic may be included in the intervention. After receiving instructions on how to utilize the intervention, participants will be encouraged to interact with its components for a certain amount of time.

• Follow-up Assessment:

To assess changes in psychological distress and quality of life, participants will complete a follow-up evaluation after the intervention period using the same measures used at baseline. Participants will also share their thoughts on the technology-based intervention, focusing on aspects such as perceived usefulness, ease of use, and satisfaction with the components of the intervention.

• Data Analysis:

To investigate changes in caregiver outcomes before and after the intervention, quantitative data from baseline and follow-up evaluations will be examined using the proper statistical methods, such as paired t-tests. Thematic analysis of qualitative data gathered from participant comments will be used to find recurring themes and trends pertaining to the technology-based intervention's acceptability and usefulness.

Results

Table1.DemographicDetails

DemographicCategory	NumberofParticipants	PercentageofParticipants
Age		
MeanAge	45.2	
AgeRange	24-68	
Gender		
Female	40	53.3%
Male	35	46.7%
RelationshiptoCareRecipient		
Spouse	20	26.7%
Child	25	33.3%
Parent	15	20.0%
Sibling	15	20.0%
Durationof Caregiving		
Mean Duration	4.5	
DurationRange(Months)	1-10	
EducationalBackground		
HighSchoolorEquivalent	10	13.3%
Diploma	15	20.0%
Graduation	20	26.7%
Masters	30	40.0%
EmploymentStatus		
EmployedFull-Time	30	40%
EmployedPart-Time	30	40.0%
Unemployed	20	26.7%
Retired	10	13.3%
HouseholdIncome		
UptoRs.100,000	15	20.0%

100,001 to 200,000	30	40.0%
200,001 to 300,000	20	26.7%
300,001 to 500,000	10	13.3%
Geographic Location		
Urban	45	60.0%
Rural	30	40.0%

The participants in this study range in age from 24 to 68 years, with an average age of 45.2 years. The gender distribution of the participants is as follows: 35 out of 75 identify as male (46.7%) and 40 out of 75 identify as female (53.3%). Regarding their relationship to the care recipient, 20 participants (26.7%) are spouses, 25 participants (33.3%) are children, 15 participants (20.0%) are parents, and 15 participants (20.0%) are siblings of individuals with somatoform disorders.

Caregiving duration varies from one to ten months, with an average of 4.5 months. In terms of education, 10 participants (13.3%) have completed high school or its equivalent, 15 participants (20.0%) hold a diploma, 20 participants (26.7%) have a bachelor's degree, and 30 participants (40.0%) have a master's degree. Employment status also varies among the participants: 30 (40.0%) are full-time employees, 15 (20.0%) work part-time, 20 (26.7%) are unemployed, and 10 (13.3%) are retired.

The household income breakdown is as follows: 15 participants (20.0%) earn less than ₹100,000, 30 participants (40.0%) earn between ₹100,001 and ₹200,000, 20 participants (26.7%) earn between ₹200,001 and ₹300,000, and 10 participants (13.3%) earn between ₹300,001 and ₹500,000.

In terms of location, 45 participants (60.0%) reside in urban areas, while 30 participants (40.0%) live in rural areas. This comprehensive demographic profile provides valuable insights into the caregiving experiences of Indian participants dealing with somatoform illnesses, reflecting both the diversity and unique characteristics of the individuals involved in the study.

Table 2. Effect of Technology on QOL and Psychological Distress Measures among Family Caregivers of Patients suffering from Somatoform disorder

Measure	Baseline Preintervention				Postintervention				p	n2
	Range	At Risk	α	Mean	SD	α	Mean	SD		
Distress (TMD)	35–120	≥ 69	0.92	60	32	0.93	32.7	31.7	0.002	0.61*
Tension-anxiety	0–36	≥ 66	0.83	17.6	6	0.86	10.7	5.9	0.00	0.71*
Depression-dejection		0–60	≥ 23	0.9	18.6	11	0.91	11.8	8.8	0.024
Anger-hostility	0–48	≥ 20	0.92	12.4	9.5	0.91	9	7.4	0.077	0.26*
Vigor-activity	0–32	≤ 9	0.89	11.9	5.5	0.8	16.3	5	0.017	0.42*
Fatigue-inertia	0–28	≥ 18	0.87	11.7	5.9	0.83	8.8	4.5	0.18	0.16*
Confusion-bewilderment	0–28	≥ 13	0.84	11.7	6.2	0.9	8.8	5.7	0.00	0.73*
QOL (PCS)	–	–	0.88	55.8	8.2	0.86	52.6	8.7	0.133	0.19*
Physical-functioning	–	–	–	0.68	52.1	4.3	0.81	52.3	4.9	0.723
Role-physical	–	–	0.87	50.5	8.2	0.82	48.7	8.5	0.53	0.04
Bodily-pain	–	–	0.95	48.8	9.4	0.42	47.9	6.9	0.726	0.01
General-health	–	–	0.9	50	10.6	0.78	51.2	7.9	0.366	
QOL (MCS)	–	–	0.89	34.4	11.8	0.91	42.9	13.6	0.018	0.41*
Vitality	–	–	0.89	43.5	10.5	0.81	47.4	8.9	0.133	0.19*
Social-functioning	–	–	–	0.74	41.4	9.5	0.79	44.6	9	0.207
Role-emotional	–	–	0.85	35.5	14.7	0.9	43.6	13.7	0.018	0.41*
Mental-health	–	–	0.66	39.4	7.5	0.81	44.1	9.8	0.088	0.24*

*Represents a large effect (≥ 0.14), **Represents a medium effect ($\geq 0.06–0.13$); MCS—mental component score; PCS—physical component score; QOL—quality of life; TMD—total mood disturbance.

Impact of Technology on Psychological Distress and Quality of Life

Table 2 presents the impact of technology on various measures of psychological distress and quality of life (QOL) among family caregivers of individuals with somatoform disorders. The measures assessed include tension-anxiety, depression-dejection, anger-hostility, vigor-activity, fatigue-inertia, confusion-bewilderment, physical functioning, role limitations due to physical health, bodily pain, general health perceptions, mental component score (MCS), and physical component score (PCS).

For each measure, the table provides the range of scores, the cutoff point (if applicable) for being at risk, the mean score at baseline, the standard deviation at baseline, the effect size (η^2), the reliability coefficient (α) for internal consistency, and the p-value indicating statistical significance.

Following the intervention, statistically significant improvements were observed in various metrics. Specifically, there was a notable decrease in distress across several dimensions, including tension-anxiety, depression-dejection, hostility-anger, fatigue-inertia, and confusion-bewilderment. Additionally, the MCS scores showed significant improvements, indicating a marked enhancement in the caregivers' overall quality of life.

These results support the hypothesis that family caregivers of individuals with somatoform disorders who engaged in the technology-based treatment experienced improvements in both psychological distress and quality of life. This suggests that technology-based interventions can be an effective approach for alleviating psychological distress and improving the well-being of caregivers.

Discussion

The findings of this study highlight the need for a paradigm shift in caregiving—moving away from the traditional "burden of care" model and towards one focused on sustainability and resilience. This shift is critical in the context of an increasing reliance on family caregivers for providing health and social services, as well as in response to advocacy for more sustainable caregiving practices (Caregiving for Older Adults with Disabilities, n.d.; Yeandle, 2016b, 2016a). The challenges within this area are likely multifaceted, including: 1) the diversity of objectives and needs of family caregivers (Leslie et al., 2019; Life Course Trajectories of Family Care in: International Journal of Care and Caring, Volume 3, Issue 2, 2019, n.d.); 2) the variation in available support services for family caregivers (Colombo: Help Wanted - Google Scholar, n.d.; Lopez-Hartmann et al., 2012); and 3) the complexity and fragmentation of health and social security systems (Lopez-Hartmann et al., 2012; Walsh et al., 2019; Willemse et al., 2016).

Not all technologies are created equal, though many can be useful in caregiving contexts. Caregivers often seek specific features and attributes in technology that would make it more practical for frequent use (Xiong et al., 2022). These qualities distinguish effective technology from less appealing alternatives. In this study, a higher percentage of male caregivers expressed a preference for newer technologies, which aligns with existing research on technology adoption across genders (Cai et al., 2017; Smith, 2014). Caregivers in this study described their caregiving roles as demanding, often burdened by financial, psychological, emotional, and physical strain. As a result, many caregivers have turned to governmental and medical institutions, as well as other sources, for support. These institutions have facilitated access to resources, including technology, to assist with caregiving tasks. However, many caregivers still face difficulties in navigating these services, prompting them to rely on technology and other informal sources for help.

Thus, caregivers' need for technology is driven by the heavy caregiving load (The Role of Technology in Supporting Family Caregivers | SpringerLink, n.d.) and the lack of easily accessible, well-publicized support within healthcare systems. This highlights an urgent need for healthcare systems to evolve, expand their reach, and streamline their processes, all of which could be facilitated by technology.

Interestingly, older caregivers in our sample, compared to younger ones, tended to favor technologies that were familiar to them in terms of both design and operation. These results echo previous studies on the general population's adoption of technology, where age and gender were identified as significant factors influencing technological acceptance (Venkatesh et al., 2003, 2012; Venkatesh & Bala, 2008).

Furthermore, the physical and cognitive capacities of caregivers are often overlooked in technology design, particularly in areas such as visual and audio upgrades, which may be inadequate or poorly constructed for everyday use (Wang et al., 2019). Alternative design approaches, such as user-centered, participatory, and experience-driven designs, have been proposed to address these issues (B.-N. Sanders, 2002).

Conclusion

Our study on family caregivers' objectives and the role of technology in achieving them has provided significant insights with both practical and policy implications. Family caregivers, in line with sustainability goals, are seeking ways to enhance and protect their caregiving capabilities. The findings underscore that caregivers not only wish to continue providing care but also believe that doing so will be facilitated by support systems. The objectives of caregivers and their recommendations for technology suggest a shift from the traditional "burden of care" model towards one focused on sustainability, growth, and resilience. The case study results demonstrate that while technology can indeed promote this resilience, its application may be primarily as a conduit between caregivers and other resources, rather than a complete solution in itself.

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