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Evaluation of Technostress Creators Among Healthcare Workers in Saudi Arabia

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ABSTRACT

Introduction: Technostress is a new form of stress and negative aspect of technology use that affects several people, including healthcare workers. Technostress may increase because of the increasing responsibilities and demands that this digitization places on health care workers (HCWs). Both individuals and organizations suffer from technostress, which has been linked to negative health outcomes, reduced job performance, increased job discontent, and disruptions in work settings. Addressing technostress among healthcare professionals has received little attention, despite the increasing adoption of technological advances in healthcare facilities. The aim of this study was to investigate the technostress creators among healthcare workers in Family Medicine Centers (FMCs).

Methods: A cross-sectional study was conducted in the family medicine centers in Saudi Arabia and included healthcare workers working there. The data were collected through an online questionnaire sent through email from February to March 2024. All the participants took a two-part questionnaire that asked about demographic data and technostress creators (complexity, overload, invasion, uncertainty, multitasking, and work interruption). Ethics approval has been given to conduct the survey by the Institutional Research Board (IRB) of the Royal Commission health service program in Jubail.

Results: In total, 101 individuals who took part in this study, 79% of them responded to the survey, the result calculated the mean and standard deviation of participants, agreement for technostress. Among all the technostress creators, the highest mean of participants, agreement recorded for techno-complexity (The technological resources that the organization uses are constantly evolving), showed 4.34±3.23. However, work interruption had a low level in the total mean (2.01±1.18); the total mean was (3.04±0.70) at level (neutral). Correlations with demographic factors were not discovered in this investigation, which indicates that technostress is a widespread problem that affects practitioners from every category.

Conclusion: This study showed a significant level of technostress among HCWs, especially in techno-complexity, which concurs with other studies. Other creators are still favorable regarding technostress. Additional investigation is required to develop causal and practical models for workable action plans.

Keywords: Technostress, Healthcare, Digitalization, Information technology

INTRODUCTION

Technology integration in professional settings has become commonplace due to recent and quickly changing technical breakthroughs, which are changing how people approach their job activities (Cascio et al., 2016). Although there are many advantages to technical advancements, the widespread use of technology in the workplace has also resulted in several detrimental effects (Salanova et al., 2013). The strain process brought on using information and communication technology (ICT) is specifically referred to as technostress, a unique phenomenon that has been conceived by recent research (Tarafdar et al., 2019). Brod originally defined technostress as the incapacity to adjust or deal with new ICTs in a healthy way is a modern adaption health issue (Brod, 1984). Furthermore, Technostress is defined by one of the most widely used definitions as the stress brought on by consequences of a person's efforts and challenges to cope with ever-changing ICTs and the shifting interpersonal and cognitive demands associated with utilizing them (Tarafdar et al., 2007).

As studies has shown, the growing use of ICTs in healthcare organizations has caused health professionals to experience higher levels of stress and anxiety, which influences their psychological wellness, performance at work, results at work, and personal well-being (Bondanini et al., 2020; Bourlakis et al., 2023). The intricacies and difficulties involved in integrating ICTs in the workplace have led to the rise in research of the notion of technostress, which blends technology and stress (Ayyagari et al., 2011). The negative consequences of technostress on people and organizations have been highlighted by researchers, who have noted disruptions in work settings, poorer job performance, higher job discontent, and poor health effects (Bondanini et al., 2020; Bourlakis et al., 2023). Concern over the connection between people's anxiety levels and technology use has grown as research shows that technostress can cause workplace disruptions, impair job performance, and have a negative impact on health (Bahamondes-Rosado et al., 2023). The necessity for efficient methods to handle technostress in healthcare facilities is highlighted by the quick speed of technological advancement and the growing use of computers and technological devices, which have made it more difficult the management of stress elements in the workplace (Murray et al., 2022).

Accelerated technological advancement, a lack of technical support, and negative feelings against technology are all responsible factors (Rajesh, 2015). Technostress has been linked to physical symptoms, according to health professionals, and coping strategies including talking to people and taking breaks from technologies have been found to be effective (Suh and Lee, 2017). Furthermore, technostress levels are influenced by demographic variables such as gender, age, and occupation and are associated with worse job satisfaction and higher turnover (Rajesh, 2015). Along with the necessity of organizational assistance for successfully handling technology-related stress, the significance of individuals and their environments in reducing stress levels has been underlined (Florkowski, 2019). Additionally, the designation of technostress as a handicap has legal ramifications, leading to suggestions for

preventive actions to lessen employer liability (Rajesh, 2015; Florkowski, 2019).

The aim of this study was to investigate technostress creators among healthcare workers of the family medicine centers belonging to Royal Commission Health Service Program in Jubail, Saudi Arabia.

METHODOLOGY

The study was cross-sectional and was carried out in March 2024 at the Family Medical Centers (FMCs) in Jubail, Saudi Arabia, which are part of the Royal Commission Health Service Program (RCHSP) among all 101 healthcare workers working there to assessment of technostress creators. A validated questionnaire that was self-administered with two parts: demographic data and technostress creators.

To carry out the investigation, ethical approval has been granted through the Institutional Review Board committee of the Royal Commission Health Service Program to conduct the dissertation and survey among the HCWs of the family medicine centers (Reference number IRB-RCH-52) and is being carried out in compliance with the ethical principles Good Clinical Practice (GCP) guidelines, the policies and procedure of RCHSP. The chief of family medicine centers approved the study and provided technical support to conduct the survey among the physicians. A consent form was obtained for participation in the study. Informed consent was sent by the department e-mail clarifying that participation was voluntary, not associated with any types of harm, with no consequences for non-participation. Prior to the start of the study, an overview regarding the purpose and subject of the investigation were given to the team of physicians.

Two components of a validated, self-administered questionnaire were used to gather the data: The first part of the questionnaire assesses the demographic and working conditions data. The technostress tool used in the second section was created and verified by Ragu-Nathan et al. (2008), which consists of a 5-point Likert scale measuring the factors that contribute to technological stress, such as technological overload, invasion, complexity, insecurity, and uncertainty (Glaser et al., 2018). Additional scales recorded were work interruptions by Büssing and Glaser (2002) and Glaser et al. (2020), Ragu-Nathan et al. (2008), and multitasking requirements adapted from adapted from Semmer et al. (1999).

The impact of technology that compels healthcare employees to work more rapidly and lengthier hours is known as techno-overload. The technological effect that compels HCWs to work past regular business hours and interferes with their personal lives is known as "techno-invasion." Techno-complexity is described as a condition where technology makes healthcare staff members think that their abilities sets are insufficient. Techno-insecurity is described as the state where the healthcare staff feel intimidated about failing to perform relative to others who have a greater understanding to utilize technologies. Techno-uncertainty pertains to an instance where regular changes and updates in software create uncertainty for the investigated participants.

The Statistical Package for the Social Sciences (IBM SPSS version 26) applications was utilized for analyzing the data statistically. Descriptive

statistics for categories linked to health and demographics were used in quantitative data analysis. Additionally, for continuous factors, values were presented as means and standard deviations or modes with ranges, and for categorical variables, as proportions and percentages. T. test and Anova test were used for effects of demographic variables on the perceived differences. A P. value of less than 0.05 was deemed statistically significant. Percentages and frequencies for categorical and qualitative variables were calculated to clarify socio-demographic and working condition data, while mean and standard deviation (SD) were used of ongoing variables.

RESULTS

There were 101 participants in total, and 79% of them responded to the survey. It's a fact that these data responses were used in the analysis. Most of the respondents were female (54.0%), whilst male recorded 46.0%; most respondents were in the age group (36–49 years) (43.8%); and, however, most of the respondents were married (78.8%), whereas the most joint educational level among respondents was Bachelor (53.8%). The majority of them were physicians (43.7%), followed by nurses (26%). Most of them – their year experience was (11–20) years, 41.03%, and 55.0% had no additional administrative work.

Results showed no significant relationship between technostress creators and sociodemographic variables, including gender, marital situation, age, educational attainment, specialty, year of experience, average number of patients seen per day and additional administrative work.

Among all the technostress creators, the highest mean of participants' agreement recorded for the techno-complexity creator (there are always new developments in the digital technologies we use in our organization) showed 4.34±3.23. However, work interruption had a low level (2.01±1.18); the total mean was (3.04±0.70) at level (neutral) (see Table 1).

The regression analysis shows the significant levels ($p < 0.05$) of several parameters, including gender, marital situation, age, educational attainment, and work experience, as well as the relationship between the predictor variables and technostress. All of these indicators, however, did not significantly predict technostress and did not show statistical significance ($p < 0.05$). Therefore, there doesn't seem to be any correlation between technostress and the demographics of the HCWs at FMCS-RCHSP.

Table 1: Mean and standard deviation (SD) total score for technostress creators.

Statement	Mean	Standard Deviation
Techno-overload	3.94	1.12
Tech-invasion	3.67	1.12
Techno-complexity	4.34	1.88
Techno-uncertainty	2.91	3.23
Techno-insecurity	2.23	3.13
Work interruptions	2.01	1.18
Multitasking requirements	3.60	2.21

DISCUSSION

Among all the technostress creators, the highest mean of participants, agreement recorded for techno-complexity creator showed (4.34), followed closely by techno-overload (3.94), techno-invasion (2.69), multitasking (3.6), techno-uncertainty (2.91), techno-insecurity (2.23). However, work interruption had a low level (2.01).

It is significant to note that prior research has frequently connected demographic variables like age and gender to technological stress (Tsertsidis et al., 2019). Such correlations were not discovered in this investigation. Particularly, the lack of a statistical correlation between technostress and demographic factors including gender, age, marital status, professional expertise, educational attainment, and professional status all point towards technostress as a widespread problem that affects practitioners from every category. This generality emphasizes how vital it is to investigate the root origins of this occurrence.

According to this survey, health professionals are especially affected by problems relating to technological challenges, capabilities, and interference with their personal life, even though those elements are still important. This is consistent with research conducted in Egypt by Kasemy et al. (2022) that found techno invasion to be the most stressful creators and Gabr et al. (2021) that found technological complexity to be the most stressful. Although various stressors were noted by Keshavarz et al. (2025), the main cause of technostress among hospital staff was technical uncertainty (Keshavarz et al., 2025). This is consistent with a 2010 study by Tiemo and Ofua that found similar pressures among librarians, highlighting the findings' wider relevance in other work situations (Tiemo and Ofua, 2010).

This study included many risk factors that have been reported elsewhere in other studies and published reports. The variables that have been linked to affect technostress were reflected in the questionnaire, which was created with reference to the most recent research available now. However, it is possible that other factors will also come into effect; these features were unfortunately excluded from the scope of our survey.

It is possible that certain limitations were imposed on the study's results. The cross-sectional methodology of the current study; therefore, longitudinal research would be required to elucidate the causal linkages among the variables under investigation. Furthermore, the study only looked at one department that was impacted by excessive technology use in the healthcare sector, its conclusions cannot be applied to other organizations. Since the study questionnaire omitted questions about the participants' personality qualities, its impact on technostress was not assessed. Technostress is an intricate problem that can be caused by both environmental and human variables. Furthermore, the study did not evaluate how different coping mechanisms affected technostress.

CONCLUSION

This study showed a significant level of technostress among HCWs, especially in techno-complexity, which concurs with other studies. Other creators, in

comparison with other countries, are still favorable regarding technostress. Healthcare employees may be able to avoid or control their technological stress and increase their productivity by having access to technological assistance, training programs, and good-quality internet connections that meet their demands. Healthcare organizations should proactively promote the digital competence sustainable environment for healthcare workers to manage expected disruptive changes. Additional investigation is required to fully understand the issue and develop causal and practical models to explain the phenomena and create workable action plans.

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