

Technostress Among Information Specialists/Librarians at a Private Higher Education Institution in South Africa: Are They Spared?

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Abstract: In the digital age, information specialists at Private Higher Education Institutions (PHEIs) played a crucial role in managing vast amounts of digital information and providing essential services to support academic activities. However, the increasing reliance on technology brought about a phenomenon known as technostress—stress or psychosocial strain experienced due to the use of information and communication technologies (ICT). The aim of this study was to explore information specialists/librarians' experiences of technostress in the context of technology integration into library services at a private higher education institution in South Africa. It sought to identify the specific challenges librarians faced due to the adoption and use of technology and to understand how these challenges affected their daily tasks, job performance, and overall job satisfaction. The study was underpinned by the Transactional Model of Stress and Coping (Lazarus & Folkman, 1984), which provided a framework for understanding how individuals cognitively appraised and coped with stressful situations. Utilizing a qualitative approach guided by the interpretivist paradigm, the research gathered comprehensive data through qualitative semi structured interviews. A purposive sample of information specialists from a leading Private Higher Education Institution (PHEI) was selected, and thematic analysis was employed to analyse the interview transcripts. Participants were invited for semi-structured interviews until saturation was achieved. The thematic results of the qualitative study illustrated the effects of technostress on information specialists at the PHEI. Participants experienced system failures, technical glitches, and challenges with new tools, which significantly increased their stress levels. This stress manifested itself in physical symptoms such as eyestrain and headaches, as well as emotional symptoms such as anxiety and frustration, often exacerbated by increased screen time and poor ergonomics. The impact on work performance varied, with some experiencing minimal or positive impacts on productivity, while others experienced significant disruption to their work and well-being. The findings improved the understanding of technostress in higher education and provided recommendations for creating a supportive work environment and promoting the well-being of information specialists/librarians. Practical suggestions were made to address the identified challenges and improve the wellbeing and effectiveness of information specialists within the PHEI. This study informed strategies to effectively combat technostress among information specialists/librarians at a PHEI.

Keywords: Job satisfaction, Information specialists, Private higher education institution, Technostress, Well-being

1. Introduction

The ever-increasing reliance on technology in today's world has led to significant advancements in various sectors, including the library and information science (LIS) field. Information specialists/librarians play a vital role in the academic ecosystem of higher education institutions. However, this rapid technological change has also introduced a new set of challenges, leading to the phenomenon of "technostress"—the stress experienced due to the constant pressure of adapting to new technologies (Ragu-Nathan, Tarafdar, Ragu-Nathan, & Tu, 2008). Information specialists/librarians, who are often at the forefront of technological adoption within libraries and institutions, are particularly susceptible to experiencing technostress. Information specialists/librarians face unique challenges in the rapidly evolving technology landscape as they must constantly adapt to new tools while training and supporting others. This dual responsibility increases stress due to the need for high levels of expertise and makes them particularly vulnerable to technostress despite the widespread adoption of technology in higher education. This study aimed to explore the experiences of information specialists/librarians at a Private Higher Education Institution (PHEI) regarding technostress within the context of technology integration into library services.

1.1 Overview of Literature

Technostress, a concept introduced by Brod (1984), is gaining attention in academic libraries and information services due to the rapid adoption of new technologies. Information specialists face psychological and physiological stress responses due to the constant need for technological upskilling (Ragu-Nathan et al., 2008; Saunders et al., 2015). This constant need for adaptation can contribute to technostress, as noted by Ennis (2005), and is exacerbated by the increasing demand for technological proficiency among library staff. Technostress negatively impacts job performance and satisfaction, leading to decreased job satisfaction and increased turnover intentions among knowledge workers (Tarafdar et al., 2015). In academic libraries, it negatively affects librarians' service quality and engagement (Shu et al., 2011). However, some studies suggest that continuous professional development can mitigate technostress (Erasmus et al., 2015). Further research is

needed to understand the experiences of information specialists and librarians at private higher education institutions in South Africa, as their specific context may present unique challenges and opportunities related to technostress.

1.2 Experiences and Challenges of Technostress and Technology Integration

Ennis (2005) defined technostress in libraries as the stress experienced by librarians due to rapid technological change and the pressure to stay proficient. This stress has intensified with the integration of technology into library services, as Aharony and Prebor (2015) observed a shift towards digital resources, online catalogues, and electronic databases. Breeding (2018) noted that cloud-based systems have further transformed library operations. However, these advancements have led to technostress, with librarians facing challenges such as the need to quickly acquire new skills (Saunders, 2015) and manage information overload (Bawden & Robinson, 2009). Studies by McClellan et al. (2022) and Bond et al. (2021) emphasized stressors like constant connectivity and the pressure to keep up with technological advancements. The impact of technostress can include anxiety, depression, and physical symptoms (Yildirim & Correia, 2023; Chang et al., 2020; Fernandes et al., 2021). Chiparausha (2022) reported that prolonged engagement with digital tools can lead to both physical and psychological exhaustion among academic librarians, exacerbated by exposure to distressing content and the challenges of remote work.

1.3 Symptoms of Technostress among Information Specialists

Technostress is a growing concern at a Private Higher Education Institution (PHEI) in South Africa's libraries due to the rapid adoption of digital technologies and AI systems. This pressure on librarians and information specialists creates physical and emotional challenges. Symptoms of technostress include computer vision syndrome, anxiety, frustration, and reduced job satisfaction. These challenges highlight the importance of technostress as a potential risk in libraries and raise concerns for staff well-being and the effectiveness of library services in the rapidly evolving digital landscape

Studies by Ranasinghe et al. (2016), Ragu-Nathan et al. (2008), and Saunders et al. (2017) highlight the prevalence of Computer Vision Syndrome (CVS) and its associated discomforts, such as eyestrain and headaches. Similarly, Chiparausha (2022) reports that prolonged exposure to digital screens among librarians results in eye problems, sleep disturbances, and increased depressive symptoms, aligning with findings by Empire Retina Consultants (2016) and Halupa and Bolliger (2020), which include headaches, stiff shoulders, and vision issues. Emotional impacts, such as anxiety and frustration, have been documented by Tarafdar et al. (2007) and Laspinas (2015), who note that these stressors lead to difficulties in concentration and job dissatisfaction. The negative effects of technostress extend to decreased job satisfaction and increased intentions to leave the profession, as observed by Tarafdar et al. (2015).

1.4 The Impact of Technostress on Librarians' Job Performance, Productivity, and Well-being

Several studies have extensively examined the relationship between technostress and job performance among librarians, revealing a complex interplay between stress levels and professional efficiency. Saunders et al. (2017) and Ragu-Nathan et al. (2008) concurred that high levels of technostress significantly impair job performance. In contrast, Ayyagari et al. (2011) observed that moderate levels of technostress could paradoxically enhance performance by motivating librarians to refine their technological skills, though this effect was limited to a narrow stress threshold. Tarafdar et al. (2015) added that adequate training and support could initially boost productivity when new technologies are adopted, but this effect tends to plateau once the technology becomes routine. Physical manifestations of technostress, such as headaches and eye strain, were highlighted by Chen and Muthitacharoen (2016), who found a high incidence of these symptoms among librarians due to prolonged digital interaction. Qualitative insights from Ennis (2005) further underscore the emotional toll, revealing pervasive themes of frustration, inadequacy, and burnout among academic librarians. Together, these studies highlight the multifaceted impact of technostress on librarians, influencing both their performance and well-being, and underscore the need for effective strategies to manage stress in the evolving technological landscape of library services.

1.5 Effective Strategies for Managing Technostress in Professional Environments

Effective management of technostress in professional environments often hinges on robust organizational strategies, as underscored by Tarafdar et al. (2015), who highlight the critical role that comprehensive technology training and technical support play in alleviating technostress. Their research shows that organizations investing in thorough training programs for their employees see a significant reduction in

technostress levels, ensuring that staff are well-equipped to handle technological challenges and minimizing stress associated with new technologies. Similarly, Tu et al. (2005) and Barber and Santuzzi (2015) emphasize the importance of well-defined ICT usage policies, noting that clear guidelines, along with work-life balance initiatives like "email-free" hours, can effectively manage issues such as techno-invasion and techno-overload.

Technostress can be effectively managed through individual coping mechanisms such as mindfulness practices and technology self-efficacy. High technology self-efficacy correlates with lower levels of technostress (Pirkkalainen et al., 2019; Shu et al., 2011). Academic librarians use practical strategies such as taking regular breaks, limiting applications, and scheduling online activities to manage technostress and maintain work-life balance. An integrative approach that combines organizational and individual strategies is most effective because it considers both structural and personal factors and leads to more sustainable results. Bondanini et al. (2020) and Tarafdar et al. (2017) advocate this comprehensive approach.

2. Model and Framework Forming a Lens Guiding This Study

This study is based on the transactional model of stress and coping (Lazarus & Folkman, 1984), which views stress as a dynamic interaction between individuals and their environment, characterized by cognitive appraisal and coping strategies. The proposed conceptual framework examines technostress among information specialists by integrating key components that influence stress. Individual characteristics such as prior experience and technical skills, the work environment including training and work expectations, and IT characteristics such as complex interfaces and information overload all contribute to technostress (Shu et al., 2011; Tarafdar et al., 2007; Ayyagari et al., 2011).

Cognitive appraisals are crucial because they determine how information specialists evaluate IT requirements and their coping abilities (Ragu-Nathan et al., 2008). Effective coping mechanisms such as social support and problem solving can mitigate the negative effects of technostress, which include reduced work efficiency, lower job satisfaction, and impaired well-being (Pirkkalainen et al., 2017; Tarafdar et al., 2019). This framework provides a comprehensive overview of the factors that influence technostress and provides insights into the ways information specialists experience and manage stress related to their work and IT use (Ahmad et al., 2014).

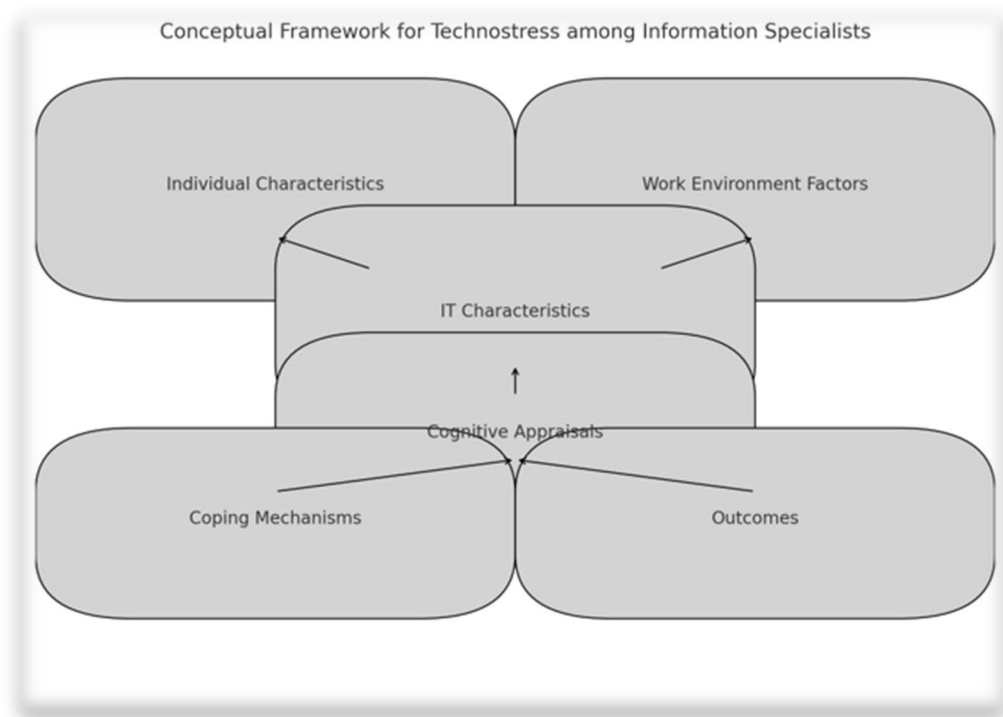


Figure 1: This figure shows how the original model by Brod (1984) has been adapted by Pasipamire (2024) to reflect new insights

The framework on technostress is supported by existing literature, which highlights individual characteristics, demographic factors, work environment factors, cognitive assessments, and coping strategies (Brod, 1984; Rosen, 1997; Ragu-Nathan et al., 2008). These elements are crucial in understanding how technostress impacts

reduced work efficiency, job satisfaction, and physical health problems. Factors such as inadequate organizational support, unclear work expectations, cognitive assessments, training, and mindfulness exercises are essential for coping (Harunavamwe & Ward, 2022). These findings support the focus on individual characteristics and coping strategies in managing technostress.

Cognitive appraisals and coping strategies such as training and mindfulness exercises are crucial for librarians to deal with technostress, which can lead to reduced work efficiency, job satisfaction, and physical health problems, as studies by Ayyagari et al. (2011), Ennis (2005), Stephens (2013), Tarafdar et al. (2015) and Pirkkalainen et al. (2019) revealed. Their results confirmed the framework's focus on outcomes and linked technostress to reduced job satisfaction and physical health problems.

3. Methodology

The study explored the experiences of information specialists experiencing technostress using an interpretivist paradigm and a qualitative approach (Denzin & Lincoln, 2008; Creswell & Creswell, 2018). The study used a case study design that focused on information specialists at a PHEI. Purposive sampling was used to select participants with library and information service experience (Patton, 2015). Data collection involved semi-structured interviews, which were recorded and transcribed verbatim (Creswell & Creswell, 2018). Thematic analysis was employed to identify recurring themes and patterns related to technostress among information specialists (Braun & Clarke, 2006). Data collection continued until saturation was reached, indicating no new information was emerging.

3.1 Data Presentation and Analysis of Findings

During the semi structured interview discussions four emerging themes were identified to address the research question: "What are the experiences and challenges of Information specialists/ librarians regarding technostress in the context of technology integration into library services, and how do these experiences affect their daily tasks and job performance?" The findings are analytically presented and discussed within these four themes.

The themes are:

- Theme 1: Experiences and Challenges of Technostress and Technology Integration
- Theme 2: Symptoms of Technostress
- Theme 3: The Impact of Technostress on Librarians' Job Performance, Productivity, and Well-being
- Theme 4: Effective Strategies for Managing Technostress

The themes identified during the data analysis, associated with technostress among Information Specialists/Librarians at a PHEI in South Africa are presented in Table 1 and discussed in detail thereafter.

Table 1: Themes

Main Themes	Sub-Themes	Description
Experiences and Challenges of Technostress and Technology Integration	Technical issues and System failures.	Librarians face significant stress and frustration due to recurring technical issues and system failures, causing emotional and mental strain during critical tasks like training sessions. Delayed IT support exacerbates their frustration and affects the users they assist.
	Challenges with Software and Tool Usability	Librarians face numerous software and tool challenges, such as network issues, software incompatibility, and format issues, which can lead to data loss, platform issues, and limited software knowledge, causing frustration and stress.
Symptoms of Technostress	Physical Symptoms	Librarians do experience physical and emotional symptoms of technostress. Physically, they often suffer from eyestrain, headaches, and general body aches due to prolonged screen use and technical issues.
	Emotional Symptoms	Librarians' performance and well-being are greatly impacted by technostress, a persistent problem that causes worry, irritation, and unhappiness with their jobs.
The Impact of Technostress on Librarians' Job Performance, Productivity, and Well-being	Varied Impact of Technostress	The effect of technostress on librarians varies widely, with some experiencing minimal disruption and others facing significant challenges in productivity and well-being.

Main Themes	Sub-Themes	Description
	Physical and Mental Health Effects	Technostress can lead to physical symptoms like migraines and exhaustion, as well as mental strain, impacting librarians' overall well-being and ability to perform their duties effectively.
Effective Strategies for Managing Technostress in Professional Environments	Taking Breaks and Physical Movement	Participants relieve stress by taking short breaks, walking around, and temporarily distancing themselves from technology to rejuvenate and refocus.
	Acceptance and Adaptation	Some participants manage stress by accepting what is beyond their control and focusing on what they can influence, which brings a sense of calm.

3.2 Theme 1: Experiences and Challenges of Technostress and Technology Integration

This theme explores the experiences and challenges of technostress and technology integration faced by information specialists in library services.

Participants were asked, "How often do you experience feelings of stress or overwhelm due to technology-related tasks or issues? Can you provide specific examples?"

"... When using systems like EBSCOhost or Workflow, it can be stressful when technical issues arise, especially during training sessions with students or lecturers. The frustration and emotional strain come from scheduling these sessions only to find that the system isn't working when needed..." [Participant I].

"... It's frustrating when librarians can't fix technical issues themselves and have to wait for IT, especially when help isn't immediately available. Software updates also cause delays, interrupting work with time-consuming pop-up messages..." [Participant C].

"...students often come to us for help when they're struggling to complete a task, especially when they're overwhelmed by deadlines or network issues. As information specialists, we sometimes need to go above and beyond to ensure they can submit their work on time..." [Participant B].

Participants were asked "Are there any particular technologies or tools that you find more challenging to use than others and why?"

"... the main challenge I often face is network issues with the tools we use. For example, sometimes when I add items to the workflow, they don't save properly, and I have to upload or edit them again due to system errors and software compatibility problems..." [Participant C]

"... I used a design on Canva, but when I tried to display it on the screens, it didn't work. This meant I had to redesign or remove important elements, causing stress because I really wanted that design, but our monitors didn't support it and I felt frustrated with the format compatibility issues in Canva ..." [Participant J]

"... the issue I have with Excel is that to get used to it, you need to use it daily. Since I don't use it often and only use a few functions, I struggle when new issues arise..." [Participant G].

The findings reveal that technological problems, such as frequent system failures and adapting to new tools, significantly increase stress levels among participants. Participants' experiences of being overwhelmed by system failures, technical glitches, and software issues align with Aharony and Prebor (2015) and Breeding (2018), who noted that such technological changes significantly impact library specialists. Ennis (2005) also highlighted that rapid technological advancements and the pressure to maintain proficiency contribute to technostress. Physical and psychological symptoms such as eyestrain, headaches, and general discomfort reported by participants align with Chiparausha (2022), who noted similar issues among librarians from extended use of digital tools.

3.3 Theme 2: Symptoms of Technostress

Participants frequently experience eyestrain, headaches, and general physical discomfort from extended screen use and poor ergonomics. Emotionally, they report high levels of anxiety and frustration, especially during technical issues and tight deadlines.

Participants were asked; “What physical, emotional, or behavioural symptoms have you experienced that you attribute to technostress in your role as an information specialist at our Private Higher Education Institution.”

The information specialists shared the following:

“...staring at the computer for long hours affects my eyes. I experience eyestrain, visual discomfort, and watery eyes from long periods at the screen, so I try to avoid staying on the computer too long...” [Participant B].

“...I get frequent headaches and anxiety, which make me sweat and feel nervous until I can relax. Extended screen use worsens these symptoms...” [Participant C].

“...being in front of the computer for a long time affects my vision and my eyes. For example, if I work from seven, I need to take bathroom breaks and come back to the computer, and I feel body aches, fatigue, and yawn during busy work periods...” [Participant F].

“...there is a lack of attention to detail and motivation. When I enter the information centre, I feel demotivated and just want to leave. This stress affects my performance and makes it hard to socialize and collaborate with other departments, creating a disaster situation....” [Participant G]

Participants frequently reported experiencing eyestrain, headaches, and general physical discomfort due to extended screen use and poor ergonomics, which aligns with Ranasinghe et al. (2016) and Watten et al. (2012), who found that prolonged computer use can cause significant eye discomfort and Computer Vision Syndrome (CVS). Headaches reported by participants are consistent with Ayyagari et al. (2011) and Chiparausha (2022), who identified headaches as a common symptom of technostress linked to extensive screen time. Emotional symptoms, such as heightened anxiety and frustration, match the findings of Tarafdar et al. (2007), who reported that technostress often increases anxiety and frustration due to job pressures and tight deadlines. This is further supported by participant reports of increased anxiety and frustration during technical failures and high-pressure periods. Observed demotivation and negative attitudes towards colleagues and students correlate with Tarafdar et al. (2015), which found a link between high levels of technostress and decreased job satisfaction. These findings are also supported by Murgu (2021) and Ranasinghe et al. (2016), confirming that technostress affects physical and emotional well-being, as well as interpersonal dynamics and job satisfaction.

3.4 Theme 3 : The Impact of Technostress on Librarians' Job Performance, Productivity, and Well-being

The impact of technostress varied widely among participants, with some experiencing significant negative effects on productivity and well-being, while others reported minimal or no notable impact. Observations revealed a range of outcomes, from minimal disruptions to significant negative effects on job performance and productivity.

Participants were asked: In what ways do you feel that technostress affects your job performance and productivity?

“...”I think the new technologies have made our jobs easier as information specialists, even though there are challenges like slow networks and computers. Despite these issues, the technologies are still beneficial for us...” [Participant B].

“...it just gets to a point where I get frustrated, but I try to manage it as much as I can. Overall, it doesn't significantly increase my stress because it's something I can control or handle...” [Participant D].

“... . I think technologies have enabled us to even reach out more to our students in a platform that doesn't have to have them physically with us here. So, there's been positive ...” [Participant H].

Participants were also asked: Can you share any personal experiences where technostress has impacted your mental or physical well-being?

“...I went to class to deliver a session on an electronic database for law students, but the database had a license that only allowed a certain number of students to log in at once. Some could log in, and some couldn't, which was frustrating because I had to advise the students who couldn't access it to just watch on the screen...” [Participant I].

"...Yeah, I would say the migraines, having like multiple migraines in a day and exhaustion. So as soon as I get to work, the only thing that you do is just fall asleep..." [Participant G]

Some individuals reported minimal impact from technology, indicating either no change or only slight disruptions in their job performance and productivity. For a few, technology even enhanced their work. This finding is consistent with studies suggesting that moderate levels of technostress can sometimes improve performance by motivating skill enhancement (Ayyagari et al., 2011).

Conversely, others experienced significant issues, such as slow technology and frustrations with tools like Excel, which negatively affected their productivity and work quality. This aligns with research indicating that high levels of technostress can reduce efficiency and productivity (Saunders et al., 2017; Ragu-Nathan et al., 2008). The experiences of anxiety, headaches, and physical symptoms such as eye strain and backache among some participants are consistent with existing research linking high technostress levels to increased anxiety, depression, and physical symptoms like headaches and eye strain (Chen & Muthitacharoen, 2016; Chiparausha, 2022).

3.5 Theme 4: Effective Strategies for Managing Technostress in Professional Environments

Based on the observed coping strategies used by information specialists, several key findings and observations emerged:

Participants were also asked: What strategies do you use to relieve stress when you feel overwhelmed by technology-related tasks?

"...If I am feeling overwhelmed, I take a short break and move away. After lunchtime, I come back and usually feel better..." [Participant H].

"... I just accept and do what I can. If it's not possible, I do what is possible and then communicate this to my line managers, letting them know if there's nothing more, we can do about it..." [Participant J].

"...I take walks around the building to take a break from the laptop screen. Another way I cope is by having tea without sugar and milk, and when I feel pressured, I play music in the background...." [Participant G].

Information Specialists employed a multi-faceted approach to managing technostress, which included physical adjustments, adaptation and learning, and support-seeking strategies. Regular breaks, physical activities, and screen adjustments were effective in alleviating symptoms such as eye strain and headaches (Tarafdar et al., 2015; Reinecke et al., 2017; Çoklar et al., 2016). Practical strategies, such as limiting the simultaneous use of applications and scheduling online activities, also contributed to stress reduction (Chiparausha, 2022). Support systems, clear ICT usage policies, and learning from technological experiences were critical elements for managing technostress (Tu et al., 2005; Barber & Santuzzi, 2015). Additionally, strategic time management and seeking assistance from colleagues and IT support were essential for effective technostress management (Tarafdar et al., 2017; Çoklar et al., 2016). Integrating individual short-term remedies and refining existing practices further enhanced technostress management.

3.6 Summary of Findings

Technological issues and the integration of new tools contributed to stress and physical discomfort. Effective management strategies, such as making physical adjustments, adapting through learning, and seeking support, were found to help address these challenges. The impact on job performance and well-being varied, with some participants experiencing significant negative effects, while others found technology beneficial or minimally disruptive. The findings underscored the need for supportive measures and effective coping strategies to manage the diverse impacts of technostress in professional environments.

4. Recommendations

To reduce technostress among information specialists, several recommendations are proposed:

First, implementing a comprehensive onboarding process is essential. This should include practical exercises and detailed documentation to facilitate technology adoption and reduce initial stress. Research by Tarafdar et al. (2015) and Shu et al. (2011) supports this approach, indicating that efficient adaptation helps lower the stress associated with learning new technologies.

Another crucial component is providing mental health resources. Access to stress management workshops and counseling services can significantly help information specialists manage the emotional and psychological impacts of their work. Evidence from Reinecke et al. (2017) and Chen & Muthitacharoen (2016) underscores the importance of such resources in coping with technostress and improving overall well-being.

Offering training on time management strategies is also important. Effective training should focus on prioritizing tasks, meeting deadlines, and managing interruptions. Ayyagari et al. (2011) and Tarafdar et al. (2017) emphasize that these techniques are vital for alleviating technostress. By equipping information specialists with time management skills, the institution can help them handle their workload more effectively.

Finally, establishing clear technology policies and support for work-life balance can significantly reduce technostress and enhance job satisfaction. Barber and Santuzzi (2015) and Tu et al. (2005) recommend policies that address technology-related expectations and support flexibility, realistic guidelines for technology use, and personal time, all of which contribute to a more manageable work environment.

5. Summary and Conclusions

Technological challenges, such as system failures and adapting to new tools, significantly increase stress among information specialists, leading to physical symptoms like eyestrain, headaches, and discomfort. Emotional symptoms like anxiety and frustration during technical failures are also observed. Some individuals reported minimal impact from technology or enhancements, while others faced significant issues like slow technology and frustrations with tools like excel, negatively affecting productivity. Physical symptoms like anxiety, headaches, and backache are also reported. Information specialists employed a multi-faceted approach to managing technostress, including physical adjustments, adaptation, and support-seeking strategies. Regular breaks, physical activities, and screen adjustments are effective in alleviating symptoms. Support systems, clear ICT usage policies, and strategic time management are crucial for managing technostress, supported by continuous refinement of these practices.

6. Areas for Further Research

There are several key contributions that add valuable insights to the existing knowledge base. The study focused on a Private Higher Education Institution in South Africa; a setting underrepresented in global technostress literature. This context-specific approach fills a gap and offers unique insights, potentially allowing for comparisons across different institutional settings within the same country or across similar contexts in the Global South.

The study suggests several areas for further research, such as exploring technostress in other private or public institutions, examining the long-term effects of technostress on job satisfaction and retention, and assessing the effectiveness of different intervention strategies. These suggestions help to map out a research agenda that could significantly advance the understanding and management of technostress in the higher education sector.

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