AI-Eustress Implications in Healthcare and Mental Health Digitalization: A Scoping Review

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Abstract
The rapid advancement of technology, particularly artificial intelligence (AI), has introduced both challenges and opportunities in human-technology interactions. The literature differentiates between technostress, techno-distress, and techno-eustress, and the emerging concept of "AI-eustress" represents the positive stress arising from AI-related challenges and incentives that contribute to personal and professional growth. As AI becomes increasingly integrated into healthcare and mental health services, understanding AI-eustress is essential. This scoping review examines AI-eustress and its implications for the digitalization of mental health systems and healthcare, identifying research gaps, synthesizing current knowledge, and proposing strategies to enhance its relevance. A systematic search of academic databases, including Scopus, Web of Science (WOS), and PubMed, yielded 250 studies, which were analyzed following scoping review guidelines. Findings from this review may contribute to the development of AI-powered frameworks for customized, real-time assessment and intervention tools, particularly in mental health. Additionally, this review explores ethical considerations and highlights priority research areas to understand the role of AI-eustress in mental health digitalization. By addressing these challenges, this study aims to pave the way for innovative AI-powered solutions that harness the beneficial aspects of technology-induced stress, ultimately improving well-being in the digital era.

Keywords: Eustress, Techno-Eustress, AI-Eustress, AI-Induced Stress, Healthcare, Mental Health, Digitalization

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Introduction

Background

Technology makes system-human relations better but also complicates behavior. Technostress resulting from technological challenges consists of both happy eustress and negative unpleasantness. Technologically, techno-eustress refers to positive stress reactions to technological-based obstacles, enhancing performance and creativity. In the framework, artificial intelligence-eustress and techno-eustress characterize AI-related and technological-use stress consequences. Whereas techno-eustress provides stress benefits from digital tools, artificial intelligence-eustress refers to stress reactions to AI algorithms that boost job efficiency, creativity, and health.

AI-eustress increases relationships and support. AI-powered social dynamic filters help moderators remove bad comments from online groups, therefore promoting good relationships and mental wellness (Rosario et al., 2022). Artificial intelligence increases community involvement and social aid, thereby creating stress. Faster operations and improved decision-making with professional AI technology help reduce artificial intelligence-eustress. Several research studies show that artificial intelligence improves staff output and organizational performance, thereby raising confidence and motivating factors (Toll et al., 2020). Advanced technology generates artificial intelligence-eustress in companies.

AI changes medical residents' employment. Inaccurate application of AI tools meant to increase patient care and output could strain resources. Adoption of artificial intelligence technology calls for weighing benefits against drawbacks (Tavory, 2024). People's stress views influence results. One could experience discomfort or stress. Issa et al. (2024) claims that responses to professional stress define techno-eustress or techno-distress. Good opinions of technology and artificial intelligence help reduce stress and anxiety.

Human biological stress response systems show how appropriate challenges increase physiological flexibility, improving health (Lu et al., 2021; Ueda et al., 2021; Xia, 2023). AI-eustress works since technologies created by artificial intelligence force humans to grow. Unlike techno-eustress, AI-eustress increases efficiency and helps users selectively (Xia, 2023). Knowing these pressures helps one assess technology.

Tools grounded in machine learning inspire kids to learn. While artificial intelligence feedback systems can foster engaging, supportive, and adaptive learning environments (Dewey et al., 2022), traditional educational technologies cannot produce similarly stress-reducing learning contexts. AI-induced eustress improves mental well-being. Ueda et al. (2021) suggest that AI-based coping mechanisms help increase emotional control and well-being.

Attributes of AI-eustress differ from those of techno-eustress. Different impacts of good stress reactions are provided by artificial intelligence- and techno-eustress. When artificial intelligence is included in society, people experience AI-eustress; conversely, using technology causes techno-eustress. These two stress types must be separated if we are to use technology and artificial intelligence to raise productivity and well-being.

Medical professionals, including psychologists, must see stress holistically. Historians often examine stress as discomfort, according to Bienertova-Vasku et al. (2020), ignoring the

eustress's growth-promoting advantages (Aschbacher et al., 2013). Mild stress, according to Aschbacher et al. (2013), enhances physiology.

AI-induced stress and techno-eustress resulting from healthcare AI systems, AI diagnostics and therapies, as well as patient contact systems (D'Alfonso, 2020), generate new stresses and positive reactions. Healthcare workers experience techno-eustress—user involvement and motivation via technology—during system adaptation (Zielonka & Rothlauf, 2021).

Psychological issues raised by artificial intelligence incorporation into systems call for investigation into human adaptations to its dual purpose.

Significance of the Study

The research constructs AI-eustress by extending the base concepts of eustress with techno-eustress. The positive stress response from AI-related challenges, leading to enhanced performance and growth, defines AI-eustress as an essential inquiry field regarding health services technology implementations.

These sectors increasingly depend on AI technology, which creates both valuable prospects and demanding challenges for healthcare personnel and their patient users. AI-eustress research requires identifying both the positive stress generators from AI systems alongside the risk factors that could potentially cause distress (Rodriguez & Choudrie, 2021).

Research Objectives

This scoping review aims to:

1. *Delineate the Historical Evolution of Stress Concepts*: Establish a timeline for stress evolution, explore the historical growth of eustress coupled with techno-eustress and AI-induced stress, and provide major theoretical elements and experimental findings.
2. *Introduce and Define AI-Eustress*: Initiate a definition of AI-eustress by introducing a clear standards-based definition that separates it from surplus constructs while exploring its healthcare and psychological effects.
3. *Develop a Theoretical Framework*: The study should integrate established models, including the Job Demands-Resources (JD-R) model with the Technology Acceptance Model (TAM), to build a complete theoretical foundation for AI-eustress (Kupang et al., 2024).
    - The JD-R model structures the assessment of AI-driven work environments, balancing demands and resources to determine their impact on stress and well-being (Demerouti & Bakker, 2011, 2023; Li et al., 2023).
    - The TAM acts as a validated framework, according to Malatji et al. (2020), to demonstrate how users experience technology-based systems related to ease of use and usefulness, which controls stress reactions and acceptance (Shamsi et al., 2021).
    - The simultaneous use of these models enables detailed understanding of AI-eustress through identification of its professional and healthcare sector origins and operational processes and outcomes.
4. *Synthesize Empirical Evidence*: Using Structural Equation Modeling (SEM) and path analysis will allow us to synthesize empirical evidence toward developing an advanced theoretical framework for eustress, techno-eustress, and AI-eustress comprehension.

    - SEM allows researchers to analyze complex relationships between invisible and detectable variables in order to reveal AI stress factors, their sources, and results (Stoffels et al., 2023).
    - Path analysis helps construct eustress frameworks by creating a system to examine causal connections, which improves assessment precision regarding AI impacts on stress-related consequences (Grimm, 2023).
5. *Establish a Logical Classification System*: Create a systematic classification approach by utilizing antecedents and consequences of AI-eustress to establish research standards about measurement scales and practical interventions.
6. *Provide Recommendations for Future Research and Practice:* Introduce plans for developing AI systems that enhance productivity through the promotion of AI-eustress among healthcare professionals and patients.

This scoping review aims to enhance knowledge in stress research specifically focused on the digital-based healthcare sector through achieving its outlined objectives. The research outcomes would support the creation of procedures to turn AI's beneficial aspects into productive uses and minimize its adverse consequences, leading to enhanced AI technology usage.

Literature Review

Historical Perspective on Eustress

The definition of eustress evolved tremendously since its origination as "good stress." Selye (1976) established eustress as a term that would distinguish healthy stress from undesirable stress. The framework enabled scientists to progress their comprehension of stress by acknowledging that not all sources of stress endanger personal well-being. Research from the early phase of study examined eustress's physiological impacts and psychological benefits, demonstrating stress's positive role in better performance, increased motivation, and resilience. Aschbacher et al. (2013) presented definitive evidence showing how intermediate stress levels reduce oxidative stress damage, which is a biological indicator of aging (García-Giménez et al., 2024). Researchers confirmed that proper amounts of stress create positive effects that help lengthen the human lifespan. Vincze and Vincze-Tiszay (2020) provided a detailed assessment of the history of stress and stress adaptation, along with education on the distinction between eustress and distress.

Overview of Eustress in Stress Frameworks

Positive stress, known as eustress, operates as the pathway through which individuals build their motivation levels, boost their resilience, and enhance their performance outcomes. Stress consists of both distressing negative aspects alongside positive eustress elements in technological environments, according to Tarafdar et al. (2024) and other earlier researchers. Many current studies show that eustress functions as an essential aspect of technology-enabled spaces since technology represents both a motivating factor and a resource for development (Saini et al., 2024).

Eustress in Specific Contexts (Table 1):

- *Adolescents and Educational Settings*: Research conducted by Yazıcı-Kabadayı (2024) demonstrates that eustress serves as a mediator that connects mental toughness with mindfulness levels in teenagers throughout educational institutions.

- *Workplace and Job Performance*: Fleige (2017) analyzed how combined elements of job demands and resources with eustress generate positive results, including better workplace job performance and increased mental well-being.
- *Health and Aging*: Eustress facilitates older adults with chronic diseases to participate more actively in recreational activities, which leads to improved quality of life, according to An et al. (2022).

Table 1: Key Ideas From the Reviewed Literature

Study	Context	Key Findings
(Saini et al., 2024)	Adolescents in India	Positive correlation between eustress and mental health; cultural nuances.
(Fleige, 2017)	Workplace settings	Job resources linked to eustress and improved emotional well-being.
(Yazıcı-Kabadayı, 2024)	Adolescents and mindfulness	Eustress positively mediates mental toughness and mindfulness.
(An et al., 2022)	Aging populations	Leisure satisfaction facilitates eustress among older adults.
(D'Alfonso, 2020)	AI in mental health	AI enhances tailored interventions for mental health.

Techno-Eustress: Technology's Impact on Stress

Investigations by Zielonka and Rothlauf (2021) reveal that techno-eustress appeared during the late 20th and early 21st centuries as positive stress that arises when people interact with technology and view this technology as platforms for development while boosting engagement, motivation, and performance levels.

SEM analysis in the study by Zielonka and Rothlauf (2021) revealed that people who find technology easy to use and beneficial to their daily lives usually develop techno-eustress. Positive views about technology enable potential workplace stressors to shift into eustressors, which enhances work-related performance. Research into techno-eustress focused on educators confirms that structural and coping mechanisms from organizations assist teachers in transforming technology stress into constructive work experiences (Solís et al., 2023).

AI-Induced Stress: A New Frontier

Due to its high-speed development, AI technologies have brought about an interaction between people and devices that generates distinct stressors affecting psychological wellness and emotional state. Users experience AI-induced stress when engaging with AI systems because they react negatively due to system complexity, job conflicts, moral concerns, and diminished control over automated procedures. Digital tools, as established by the Job Demands-Resources (JD-R) paradigm, serve as instruments that create both work-related needs and favorable aspects (Scholze & Hecker, 2023).

Two primary workload categories are presented by artificial intelligence systems:

1. Data automation and processing capacity
2. Algorithm learning requirements and AI output interpretation needs

Organizations must handle their AI systems in ways that generate enough resources to balance workload requirements by establishing training sessions, encouraging supportive environments, and making AI system decisions open and clear (Scholze & Hecker, 2023).

Introducing AI-Eustress: A Novel Construct

AI-eustress emerges as a positive stress response that enhances cognitive flexibility, performance, and motivation. Users thrive under AI challenges when they perceive them as opportunities for skill-building.

Key Factors Influencing AI-Eustress:

1. *Perceived Usefulness and Ease of Use* – Users develop AI-eustress when they find AI useful and easy to integrate (Gado et al., 2022; Kashive et al., 2020; Kim et al., 2021).
2. *Self-Efficacy and Coping Strategies* – High self-confidence in AI interaction enhances eustress (Chen et al., 2024; Lorente et al., 2014; Venkatesh, 2000; Wang & Yen, 2015).
3. *Organizational Support and Culture* – AI-eustress flourishes in learning-oriented, supportive environments (Galanti et al., 2024; Na et al., 2023).
4. *Ethical Considerations* – Transparency, fairness, and privacy protections promote positive AI interactions, while bias and accountability issues contribute to distress (Issa et al., 2024; Saeidnia et al., 2024).
5. *AI-Eustress and Digital Mental Health* – AI-based interventions in mental healthcare facilitate resilience and cognitive growth (D'Alfonso, 2020; Kibibi, 2024; Tavory, 2024).

Theoretical Framework

Understanding AI-eustress requires a comprehensive theoretical foundation (Kupang et al., 2024). Existing models help explain how individuals perceive AI stress and adapt to it.

- Job Demands-Resources (JD-R) Model – Explains how job demands and resources shape employee well-being (Lesener et al., 2019).
- Technology Acceptance Model (TAM) – Establishes perceived usefulness and ease of use as key factors influencing AI adoption (Venkatesh & Davis, 2000).
- Social Cognitive Theory – Explores how individual behaviors and attitudes toward AI influence stress outcomes (Tsai, 2014).
- Person-Environment (P-E) Fit Theory – Describes how AI systems must align with users' cognitive abilities to maximize positive stress effects (Caplan & Van Harrison, 1993).

Methodologies for Theoretical Framework Consideration: SEM and Path Analysis

Structural Equation Modeling (SEM) and path analysis provide robust methodologies for examining AI-eustress. These techniques assess causal relationships between stressors and coping mechanisms.

- SEM enables researchers to model interactions between AI, stress, and well-being (Hartwell et al., 2019).

- Path Analysis refines eustress frameworks by tracing direct and indirect stress-response pathways (Khairi et al., 2021).
- Advanced SEM Tools (Lavaan, AMOS) facilitate large-scale AI stress research (Rosseel, 2012; South & Jarnecke, 2017).

These methodologies ensure rigorous classification of AI-eustress, contributing to future research and practical AI deployment strategies.

Methodology

Scoping Review Approach

A scoping review methodology served as the framework to map all available literature about eustress alongside techno-eustress, together with developing AI-eustress as its new subclass. The methodology follows Arksey and O'Malley's (2005) principles while applying PRISMA-ScR guidelines to suit the investigation of AI-eustress, which is an evolving segmental construct (Daudt et al., 2013; Tricco et al., 2018).

Systematic improvements through both stakeholder involvement and multiple data collection methods created a solid framework to merge results and recognize missing information. This methodology delivers complete insights concerning AI-eustress, creating a framework for future healthcare and digital health research (Peters et al., 2020; Westphaln et al., 2021).

Search Strategy

The research used three respected academic databases, namely Scopus, Web of Science (WOS), and PubMed, for an organized search strategy. The selection of these databases gave researchers access to the most comprehensive literature available in healthcare, psychology, and information technology research.

Three key concepts were linked through a combination of specific research keywords within the search procedure:

- ✓ Eustress and Stress Types: *"eustress," "distress," "stress," "chronic stress," "acute stress"*
- ✓ Technology-Related Stress: *"technostress," "techno-eustress," "digital stress"*
- ✓ AI-Related Stress: *"AI-induced stress," "AI-eustress," "artificial intelligence and stress"*
- ✓ Healthcare and Mental Health: *"healthcare," "mental health," "digital health," "health informatics"*
- ✓ Outcomes: *"well-being," "job satisfaction," "performance," "productivity," "innovation"*
- ✓ Methodological Terms: *"structural equation modeling," "SEM," "path analysis," "predictive models"*

Articles published in English formed the basis of this study because researchers applied restrictions according to date limitations to track the concepts' historical development.

Inclusion and Exclusion Criteria

The following inclusion and exclusion criteria were applied to select relevant studies:

Inclusion Criteria:

1. *Focus on Eustress, Techno-Eustress, or AI-Stress*: Studies that explicitly addressed eustress, techno-eustress, AI-induced stress, or AI-eustress were included.
2. *Empirical Studies*: Empirical studies that collected and analyzed quantitative or qualitative data were included.
3. *Theoretical Papers*: Theoretical papers that contributed to the conceptual understanding of eustress, techno-eustress, or AI-eustress were included.
4. *Healthcare or Mental Health Context*: Studies that focused on healthcare or mental health settings, or had implications for these settings, were included.

Exclusion Criteria:

1. *Non-Peer-Reviewed Literature*: *Gray literature*, such as conference abstracts, dissertations, and reports, were excluded.
2. *Studies Unrelated to Stress*: Studies that did not address stress or its related constructs were excluded.
3. *Studies Not Focused on Technology or AI*: Studies that did not focus on technology or AI were excluded, unless they provided relevant theoretical insights into eustress or stress in general.
4. *Articles Not in English*: Studies published in languages other than English were excluded.

Data Extraction and Analysis

A total of 250 articles were initially retrieved after applying the inclusion and exclusion criteria from the database search. 45 articles were selected for full-text review and data extraction.

A standardized data extraction form was developed to capture key information from each study, including:

1. Study Characteristics: *Author(s), year of publication, study design, sample characteristics, setting.*
2. Theoretical Framework: *Theoretical models or concepts used in the study.*
3. Key Constructs: *Definitions and operationalizations of eustress, techno-eustress, AI-induced stress, and AI-eustress.*
4. Antecedents: *Factors identified as antecedents of eustress, techno-eustress, or AI-eustress.*
5. Consequences: *Outcomes associated with eustress, techno-eustress, or AI-eustress.*
6. Methodological Approach: *Research methods used, including data collection and analysis techniques.*
7. Key Findings: *Main findings related to the relationships between antecedents, constructs, and consequences.*

Researchers combined quantitative with qualitative methods when they analyzed the extracted data. The study characteristics summaries served as a part of quantitative analysis, with frequency and percentage tables used to track antecedents and consequences versus psychosocial constructs and confirmed variables.

A thematic synthesis identified and described frequent themes emerging from various studies. The researchers merged the outcomes from quantitative and qualitative assessments to build a thorough view of modern eustress research, while considering techno-eustress and AI-eustress.

Categorization Framework from SEM and Path Analysis Models

The database analysis depended on collecting information from studies that adopted both Structural Equation Modeling (SEM) and path analysis methods.

The research investigations revealed relevant associations among fundamental factors that affect eustress and its digital-related manifestations, as well as their intervening/moderating factors.

Research studies provided data that led to developing a categorization system for organizing antecedents and consequences, through identification of common connections and theoretical foundations between elements.

Findings

Antecedents and Consequences of AI-Eustress and Techno-Eustress

Scientists derived the classification framework shown in Table 2 by performing systematic analysis on variables and relationships present in path analysis and SEM models within the 45 final studies listed. The model defines six different classifications for antecedents.

Table 2: Categorization Framework From SEM and Path Analysis Models

Category	Antecedents	Consequences	Supporting Studies
Individual Capacities	Resilience, IT mindfulness, self-efficacy, coping flexibility, personality traits (Curiosity, sensation seeking, and persistence), and age	Enhanced skills, increased job satisfaction, performance	(De Cordova et al., 2024; González-Hernández & Ato-Gil, 2019; Scherz et al., 2023; Zhao et al., 2023, 2024)
Motivational Drivers	Intrinsic motivation, career advancement goals	Innovation, adaptive behaviors	(Anjum et al., 2023)
Perceptual Factors	Positive appraisal, adaptability, techno-enrichment	Improved satisfaction, cognitive engagement	(Fu et al., 2023; Pluut et al., 2022; Tarafdar et al., 2024)

Category	Antecedents	Consequences	Supporting Studies
Socio-Cultural Enablers	Social support, inclusive organizational culture	Team collaboration, reduced stress	(Gabbiadini et al., 2023; Issa et al., 2024; Khedhaouria et al., 2024; Saini et al., 2024)
Technological Features	Usability, reliability, system adaptability, technological proficiency, accountability	Productivity, technological proficiency	(Asfahani, 2022; Awada et al., 2023; Tarafdar et al., 2019)
Organizational Context	Technical support, innovation, encouragement, synergic literacy	Job performance, employee retention	(Daneshmandi et al., 2023; Menon et al., 2022; Nascimento et al., 2024; Naz et al., 2020; Nelson & Simmons, 2005; Pham et al., 2024; Tarafdar et al., 2010; Wulansari et al., 2015)

Theoretical Framework for AI-Eustress

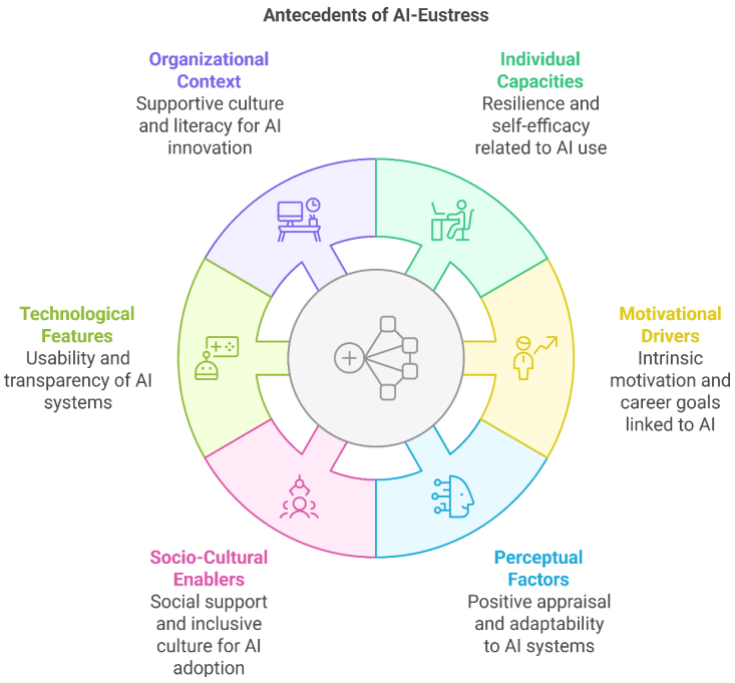
Research findings about techno-eustress led to the creation of a theoretical framework that combines the JD-R model, TAM, social cognitive theory, and person-environment fit. AI-eustress emerges from multiple interacting factors, which include individual capabilities, motivational elements, perceptual components, socio-cultural facilitators, technological aspects, and workplace factors.

Antecedents

The antecedents of AI-eustress (Figure 1) are similar to those of techno-eustress, but with a specific focus on AI-specific features. These include:

- ✓ *Individual Capacities*: Resilience, IT mindfulness, self-efficacy specifically related to AI use, coping flexibility, personality traits (Curiosity, sensation seeking, and persistence), and age.
- ✓ *Motivational Drivers*: Intrinsic motivation to use AI, career advancement goals related to AI proficiency.
- ✓ *Perceptual Factors*: Positive appraisal of AI-related challenges, adaptability to AI systems, perceived AI-enrichment.
- ✓ *Socio-Cultural Enablers*: Social support for AI use, inclusive organizational culture that values AI adoption.
- ✓ *Technological Features*: Usability, reliability, adaptability, transparency, and accountability of AI systems.
- ✓ *Organizational Context*: Technical support for AI tools, an organizational culture that promotes AI innovation, management encouragement for AI adoption, and organizational AI literacy.

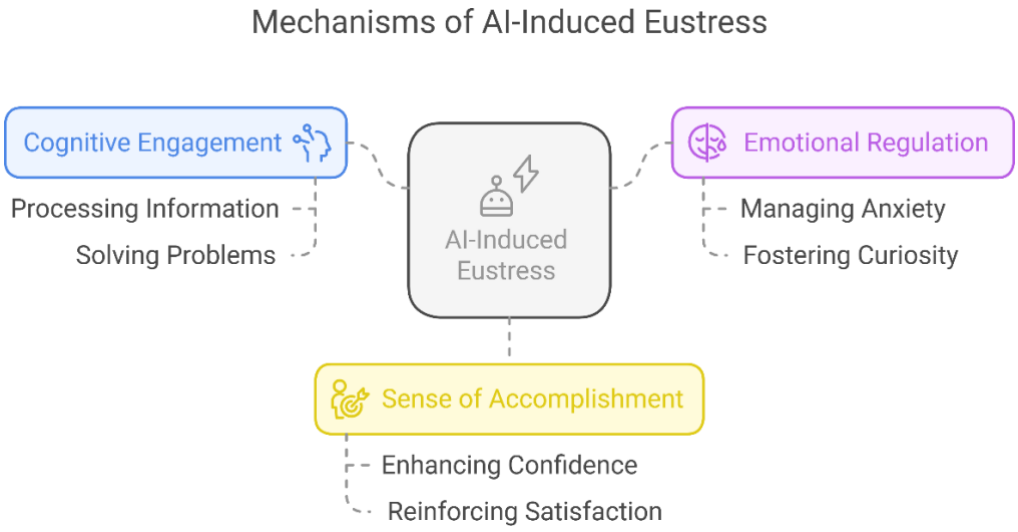
Figure 1: Antecedents of AI-Eustress



Mechanisms

The conceptual model demonstrates that AI systems create mental and emotional obstacles which people can transform into growth potential to build AI-eustress. The difficulties stem from mastering new AI systems and adapting workflow processes as well as comprehension of AI results and dealing ethically with AI systems' implications. (Figure 2) outlines the mechanism that explains how the challenges create AI-eustress.

Figure 2: Mechanisms of AI-Induced Eustress

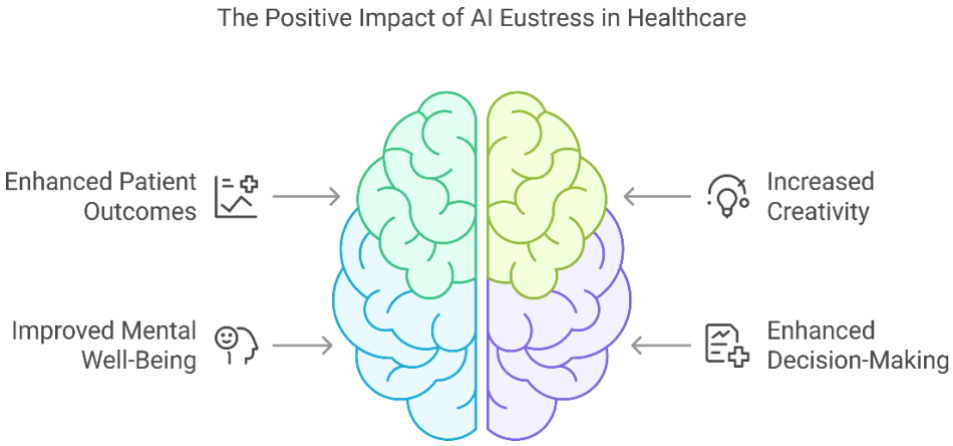


✓ **Cognitive Engagement**: The challenges from AI systems create cognitive difficulties, forcing people to engage in active mental processing, problem-solving, and constructing new ways of thinking. AI tools maximize user cognitive control, enabling users to find AI useful and applicable in their work (Henkel et al., 2020).

✓ **Emotional Regulation**: The experience of eustress requires people to control their emotions and develop curiosity and satisfaction to manage anxiety and frustration successfully. Research studies show how cognitive reappraisal methods and adaptive coping mechanisms work together to generate positive responses in demanding AI environments (Salih, 2023).

✓ **Sense of Accomplishment**: People who reach their AI-related objectives create eustress through feelings of accomplishment. Scientific evidence demonstrates that effective interaction with AI systems leads to increased self-confidence and contentment, strengthening positive emotional reactions (Kolomaznik et al., 2024).

Figure 3: The Positive Impact of AI Eustress in Healthcare



Consequences (Figure 3)

✓ **Enhanced Professional and Patient Outcomes**:

- AI-eustress improves diagnostic precision, personalized treatment, and better decision-making.
- AI assists radiologists in identifying early disease detection (e.g., cancer diagnoses).
- AI-powered clinical decision support systems improve care quality and consistency (Alandjani, 2023; Patil & Shankar, 2023).
- AI-eustress reduces burnout, improving healthcare workforce retention (Shinners et al., 2020).

✓ **Increased Creativity and Innovation**:

- Professionals experiencing AI-eustress develop new AI applications.
- AI-based mental healthcare solutions were developed due to AI-eustress (Okhiai & Loo, 2022).
- Cognitive advancements in healthcare were fostered (Anjum & Zhao, 2022).

✓ **Improved Mental Well-Being**:

- AI-eustress increases self-worth, fulfillment, enthusiasm, and contentment.
- Positive emotions from AI help healthcare professionals maintain resilience in digital healthcare environments (Adegboye, 2024; Tortorella et al., 2021).

✓ **Enhanced Decision-Making**:

- AI-eustress improves professionals' ability to combine AI-generated insights with clinical expertise.
- AI diagnostic tools assist medical staff in refining clinical reasoning (Dawoodbhoy et al., 2021).

Discussion

The review establishes a full framework that explains AI-eustress during healthcare and mental health processes. The combination of programmatic recommendations enables organizations to use transformative AI potential safely for professional wellness and increased patient care in digital healthcare. The support given by organizations serves as a key factor that helps reduce stress levels and improve workplace well-being among healthcare professionals (Ramaci et al., 2024).

The literature review compiles multiple quantitative and qualitative studies that connect eustress examination to techno-eustress dynamics and current research about AI-eustress in medical and mental healthcare digitalization development. Research shows that positive stress responses from AI technology result from three interacting factors, which include:

- ✓ Individual capabilities
- ✓ Organizational policies
- ✓ AI system development elements

The study uses the Job Demands-Resources (JD-R) model and the Technology Acceptance Model (TAM) to create a basic framework that explains methods to enhance healthcare worker creativity, productivity, and well-being through optimal AI-eustress implementation (Khan & Shamsi, 2021).

Integration With Theoretical Frameworks

The proposed AI-eustress framework presents AI systems as dual entities under the JD-R model, according to Demerouti and Bakker (2023). Accurate perceptions of AI management together with AI usefulness enable these systems to operate as resources that improve user engagement while boosting performance and motivation (Kaiser et al., 2020). AI systems that present design flaws or complexity evolve into overwhelming demands, which create distress for users.

✓ Perceived ease of use and utility affect user acceptance and stress-level enhancement through the TAM model, requiring AI developers to design intuitive interfaces (Baroni et al., 2022).

Practical Implications

The research outcomes establish several vital requirements for healthcare organizations to meet.

✓ **User-Centered AI Design**

- The design of AI systems should emphasize usability, transparency, and adaptability, as these aspects lower cognitive overload and boost user engagement.
- Users benefit from XAI features that explain AI outputs, improving understanding and trust in AI systems (Adeniran et al., 2024; Melikoğlu, 2024).

✓ **Comprehensive Training Programs**

- Organizations need complete training programs to develop employee skills in AI understanding, coping methods, and self-assurance abilities.
- The skills required to work with modern AI technologies require continuous development through professional support from healthcare professionals (Panigutti et al., 2023).

✓ **Supportive Organizational Culture**

- Leadership teams need to establish supportive workplace cultures that enable healthcare staff to investigate AI tool applications.
- Maximizing AI-eustress depends on the combination of open dialogue, collaborative teamwork, and appropriate budget allocation (Ramaci et al., 2024).

✓ **Ethical Considerations**

- The adoption of proactive solutions will tackle AI ethical concerns while constructing trust frameworks to combat AI-related stress.
- The establishment of transparent accountabilities and bias-detection techniques creates trust between stakeholders (Edith Ebele Agu et al., 2024; Sargiotis, 2024).
- Robust data protection, explainable AI systems, and clear accountability frameworks enable healthcare organizations to prevent disparities and ensure responsible AI deployment (Islam, 2024; Jeyaraman et al., 2023).
- The combined implementation of these strategies allows for both ethical governance and minimized risk in AI systems.

Limitations

Several limitations must be acknowledged:

✓ **Language and Publication Bias**

- The review was limited to English-language, peer-reviewed articles, potentially excluding relevant research in other languages or gray literature.

✓ **Lack of Empirical Validation**

- While this study proposes a theoretical framework, it lacks empirical testing to validate the identified relationships between antecedents, mechanisms, and consequences of AI-eustress.

✓ **Healthcare-Centric Focus**

- The focus on healthcare and mental health limits the generalizability of findings to other sectors where AI-eustress may operate differently.

Future Research Directions

To advance the understanding of AI-eustress, future research should:

1. Empirically validate the framework through quantitative studies such as Structural Equation Modeling (SEM).
2. Develop standardized measures to differentiate AI-eustress from techno-distress.
3. Explore cross-cultural perspectives to understand how cultural factors influence AI-eustress.
4. Conduct longitudinal studies to examine the long-term effects of AI on healthcare professionals' well-being.
5. Design interventions that enhance AI-eustress and reduce AI-induced distress.

Conclusion

The scoping review findings will help to understand the new concept of AI-eustress and the importance of healthcare and mental health digitalization. AI applications can elicit either eustress or distress, depending on the ability of people to cope with the technology, the characteristics of the AI itself, and their workplace settings. Identifying and cultivating AI-

eustress could be a roadmap to improving healthcare professionals' productivity, creativity, and mental health.

The theoretical framework combines established models (like the JD-R model and TAM) to show how challenges from AI can be managed to turn them into opportunities for growth and performance improvement. The key result shows the need to build user-centered transparent, and adaptable AI. Also, building comprehensive training programs along with a supportive organizational culture. We must also address issues like bias, privacy and accountability--for the sake of the user.

By dealing with these factors' healthcare organizations will be able to unlock the potential of AI Practical recommendations include.

- **Adopting User-Centered AI Design:** Prioritize usability and transparency to reduce cognitive strain.
- **Enhancing AI Literacy:** Implement training that boosts self-efficacy and coping mechanisms.
- **Fostering Supportive Work Environments:** Encourage open communication and collaboration.
- **Embedding Ethical Safeguards:** Ensure fairness, accountability, and data privacy in AI systems.

Going forward, research should empirically test the framework proposed for AI-eustress, develop reliable measurement tools to measure AI-eustress and assess the long-term impact of AI integration on various type of healthcare setting. An in-depth grasp of AI-eustress optimization necessitates longitudinal and cross-cultural studies and intervention-based research for improved healthcare delivery and professional well-being.

Embracing the salutary uses of AI in the medical arena is an equally important opportunity. By putting AI systems that promote eustress into operation in the health system, we can not just make the operations more efficient but also help develop a healthy and strong workforce for better patient care.

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