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AI-Related Technostress, Psychological Needs, and Work Engagement in Digital Counseling

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ABSTRACT

Purpose - This study investigates how AI-related technostress, digital counseling self-efficacy, psychological empowerment in AI-augmented practice, and perceived trust in AI-assisted psychological support influence work engagement in digital counseling. Drawing on the Job Demands–Resources Model and Self-Determination Theory, the study positions basic psychological need satisfaction at work as a central motivational mechanism linking AI-related psychosocial demands and resources to professional engagement.

Design/methodology/approach - A quantitative, cross-sectional survey design was employed using a structured self-administered questionnaire. Data were analyzed with Partial Least Squares Structural Equation Modeling (PLS-SEM) using SmartPLS. The model examined direct and indirect relationships among six latent constructs: AI-related technostress, digital counseling self-efficacy, psychological empowerment in AI-augmented practice, perceived trust in AI-assisted psychological support, basic psychological need satisfaction at work, and work engagement.

Findings - The findings indicate that AI-related technostress weakens basic psychological need satisfaction and work engagement, suggesting that AI can become a psychosocial demand when it creates uncertainty, role ambiguity, and pressure to adapt. In contrast, digital counseling self-efficacy, psychological empowerment, and perceived trust in AI-assisted psychological support strengthen autonomy, competence, relatedness, and engagement. Basic psychological need satisfaction emerges as a key motivational pathway through which AI-related work experiences shape professional engagement.

Originality/value - This study contributes to digital counseling and cyberpsychology literature by explaining AI integration as a psychosocial and motivational process rather than merely a technological readiness issue. It extends the Job Demands–Resources Model and Self-Determination Theory into AI-assisted counseling by showing that sustainable AI use depends on reducing technostress while preserving professional agency, ethical judgment, psychological need satisfaction, and human connection.

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1. Introduction

The landscape of digital counseling is being transformed by artificial intelligence (AI), which is changing how information is created, analyzed, and used in professional helping practices. AI-powered tools such as chatbots, automated feedback systems, digital screening aids, and psychoeducational technologies are opening up new opportunities to enhance access, responsiveness, and personalization in mental health and counseling services (Abd-Alrazaq et al., 2020; Boucher et al., 2021). However, AI is not merely a neutral technical tool. Its integration into counseling raises important psychological, ethical, and relational issues related to trust, human judgment, data security, bias, emotional engagement, and the distinction between machine-generated assistance and human-centered care (Adams et al., 2023; Holmes et al., 2022; Yan et al., 2025).

Previous research suggests that the successful integration of AI depends on more than technical skills. For example, Celik (2023) emphasized that AI-driven professional practices should combine technological expertise, pedagogical understanding, and ethical considerations. This is particularly important in counseling settings, where practitioners must balance empathy, confidentiality, autonomy, and responsible judgment when using digital and AI-supported tools. While AI can facilitate psychoeducation, documentation, preliminary data processing, and decision-making, it also introduces new psychological challenges, as professionals must continuously evaluate the reliability, appropriateness, and ethical implications of AI-generated results.

A significant psychological consequence of AI-driven work is technostress, which stems from the difficulties of adjusting to digital tools. This can manifest as feelings of overload, uncertainty, complexity, and role disruption (Dragano and Lunau, 2020; Nisafani et al., 2020). In counseling, AI-related technostress may occur when professionals feel pressured to constantly learn new technologies, manage digital documentation, assess AI outputs, and uphold ethical standards in technology-mediated settings. These issues are consistent with evidence that work-related ICT use can negatively affect well-being when technological demands exceed available resources (Baumeister et al., 2021). Furthermore, the boundaries of professional roles and perceived control can shift during digital transformation, highlighting the importance of work design in automated and algorithm-driven environments.

Conversely, psychological resources can help professionals adapt to AI-supported counseling. Digital counseling self-efficacy refers to confidence in using digital or AI-assisted tools in ways that align with professional standards. This sense of self-efficacy is important because professionals who trust their ability to manage technology are more inclined to pursue adaptive learning, critically evaluate digital outcomes, and remain motivated in technology-enabled work (Chiu et al., 2025; Pan, 2020). Psychological empowerment is also vital because it reflects meaning, competence, autonomy, and influence in professional roles. When professionals view AI as a supportive tool rather than a replacement for their own judgment, they are more likely to experience greater agency and engagement (Gong et al., 2020; Llorente-Alonso et al., 2024).

Trust in AI is also a prerequisite for digital counseling. This does not imply unquestioning acceptance of AI outputs; rather, it requires reliable performance, transparency, human oversight, and awareness of system limitations (Glikson and Woolley, 2020a,b). In psychological contexts, excessive trust can result in overreliance, while insufficient trust may prevent professionals from using beneficial tools. Recent research emphasizes that trust and digital skills are key factors in the adoption of AI tools by professionals (Lucas et al., 2024). Consequently, perceived trust in AI-supported psychological services should be recognized as a psychological resource that influences professionals' engagement during human-AI collaboration.

This study emphasizes that satisfying basic psychological needs is a vital motivational factor connecting AI-related demands and resources to work engagement. According to Self-Determination Theory, autonomy, competence, and relatedness are fundamental psychological needs that promote optimal motivation and functioning. In the workplace, satisfaction of these needs is associated with meaningful work, autonomous motivation, and better occupational outcomes (Autin et al., 2022; Coxen et al., 2021). In digital counseling, professionals are more likely to remain engaged when they feel autonomous in their use of AI, competent in assessing its outputs, and emotionally connected with clients or users despite technological mediation.

A key psychological outcome in this study is work engagement, a positive work state characterized by vigor, dedication, and absorption. According to the Job Demands-Resources framework, engagement reflects the process by which individuals use personal and professional resources to manage demands effectively and maintain motivation in the workplace (Bakker and de Vries, 2021; Mazzetti et al., 2023). This perspective is especially relevant in AI-assisted counseling because digital technologies can function as both demands and resources (Gutierrez et al., 2024; Nazir, 2026). Although AI may increase workload and uncertainty, it can also improve efficiency, perceived competence, and professional impact when supported by sufficient psychological resources.

Despite growing interest in artificial intelligence and digital mental health, further research is needed to integrate technostress, self-efficacy, empowerment, trust, psychological need satisfaction, and work engagement into a unified psychological model of digital counseling. Existing studies tend to focus separately on AI adoption, ethical issues, or the effectiveness of digital tools (Albannai and Raziq, 2025). This approach results in an incomplete understanding of how AI-related psychosocial demands and resources influence motivation and engagement. Addressing this issue is important because successful AI integration in counseling depends not only on technological capability but also on psychological conditions that enable professionals to maintain autonomy, competence, connection, and active involvement.

This study examines how AI-related technostress, digital counseling self-efficacy, psychological empowerment in AI-augmented practice, and perceived trust in AI-assisted psychological support are associated with work engagement through basic psychological need satisfaction at work. The central research question is: How do AI-related psychosocial demands and resources shape psychological need satisfaction and work engagement in digital counseling?

The remainder of this article is organized as follows. Section 2 reviews the theoretical foundations and formulates the research hypotheses. Section 3 explains the research design, instruments, sampling procedure, and data analysis approach. Section 4 presents the empirical results of the measurement and structural models used to test the hypotheses. Section 5 discusses the theoretical and practical implications of the findings and their application across relevant contexts.

2. Literature Review

2.1 Theoretical Foundation

The present study draws primarily on the Job Demands-Resources (JD-R) Model and Self-Determination Theory (SDT). The JD-R Model posits that work engagement depends on the balance between job demands that deplete psychological energy and job resources that promote motivation, growth, and performance (Bakker and de Vries, 2021; Mazzetti et al., 2023). In digital counseling, AI-related technostress represents a psychosocial job demand because professionals must adapt to new digital systems, evaluate AI-generated outputs, and manage uncertainties related to ethical and psychological appropriateness. Conversely, digital counseling self-efficacy, psychological empowerment in AI-augmented practice, and perceived trust in AI-assisted psychological support function as psychosocial resources that may enhance engagement. SDT further explains that motivation and well-being in the workplace depend on the satisfaction of autonomy, competence, and relatedness (Autin et al., 2022; Coxen et al., 2021). Social Cognitive Theory also highlights self-efficacy as a belief that fosters adaptive behavior in technology-driven practice (Chiu et al., 2025; Pan, 2020). Furthermore, perspectives on human trust in AI and the Intelligent-TPACK framework emphasize that effective AI use depends on calibrated trust, ethical judgment, and professional control rather than blind acceptance (Celik, 2023; Glikson and Woolley, 2020b; Lucas et al., 2024).

2.2 Psychosocial Demands, Resources, and Work Engagement

In the JD-R model, work engagement results from a complex interplay between demands that deplete psychological energy and resources that foster motivation, perseverance, and occupational meaning (Bakker and de Vries, 2021; Mazzetti et al., 2023). AI-related technostress can be considered a psychosocial job demand because counseling professionals must continually adapt to new digital systems, assess AI outputs, and manage uncertainties regarding the ethical and psychological appropriateness of technology-supported services. This form of technostress may stem from technology overload, complexity, uncertainty, role ambiguity, and the pressure to remain digitally proficient (Dragano and Lunau, 2020; Nisafani et al., 2020). In digital counseling, these pressures may diminish work engagement by depleting emotional and cognitive resources, increasing anxiety, and weakening professional clarity. Studies of ICT use in the workplace indicate that when digital demands exceed available resources, they can negatively affect well-being (Baumeister et al., 2021). Furthermore, the presence of algorithms and automated systems may shift perceived control and role boundaries in professional work. Consequently, AI-related technostress is expected to have a detrimental effect on work engagement.

In contrast, high levels of digital counseling self-efficacy, psychological empowerment in AI-augmented practice, and perceived trust in AI-assisted psychological support can act as psychosocial resources. These resources may enhance work engagement through the motivational pathway of the JD-R model. Digital counseling self-efficacy refers to confidence in using, assessing, and ethically handling digital or AI-

supported tools, encouraging professionals to approach AI-related challenges with adaptability rather than avoidance (Chiu et al., 2025; Pan, 2020). Psychological empowerment reflects meaning, competence, autonomy, and perceived influence, enabling professionals to view AI as a beneficial extension of their work rather than a threat to professional autonomy (Gong et al., 2020; Llorente-Alonso et al., 2024). Perceived trust in AI-assisted support may further enhance engagement when trust is well calibrated, transparent, and complemented by human verification rather than blind faith (Glikson and Woolley, 2020b; Lucas et al., 2024). These resources are expected to support professionals in maintaining energy, commitment, and absorption in digital counseling work.

- H1.** AI-Related Technostress negatively affects Work Engagement.
- H2.** Digital Counseling Self-Efficacy positively affects Work Engagement.
- H3.** Psychological Empowerment in AI-Augmented Practice positively affects Work Engagement.
- H4.** Perceived Trust in AI-Assisted Psychological Support positively affects Work Engagement.

2.3 Psychosocial Demands, Resources, and Psychological Need Satisfaction

Basic Psychological Need Satisfaction at Work involves the fulfillment of autonomy, competence, and relatedness within occupational environments, which is fundamental to Self-Determination Theory and employee well-being (Autin et al., 2022; Coxen et al., 2021). In digital counseling, AI-related technostress can threaten these needs by reducing perceived autonomy, undermining confidence in professional skills, and weakening trust in human-centered services. The ongoing need to learn new AI tools, assess uncertain results, and navigate ethical or role ambiguities may leave professionals feeling less in control and less competent. According to the JD-R model, these digital demands can deplete psychological resources and hinder motivation (Bakker and de Vries, 2021; Baumeister et al., 2021). Consequently, AI-related technostress is likely to impair Basic Psychological Need Satisfaction at Work.

In contrast, digital counseling self-efficacy, psychological empowerment, and perceived trust in AI-assisted psychological support serve as psychosocial resources that enhance need satisfaction. Digital counseling self-efficacy fosters the need for competence because professionals who are confident in using and assessing AI tools are more likely to feel capable in technology-mediated practice (Chiu et al., 2025; Pan, 2020). Psychological empowerment strengthens autonomy and purpose by allowing professionals to perceive AI as a tool that supports, rather than replaces, their professional judgment (Gong et al., 2020; Llorente-Alonso et al., 2024). Perceived trust in AI-assisted psychological services can also support competence and relational security, especially when trust is built through transparency, human verification, and ethical considerations (Glikson and Woolley, 2020b; Lucas et al., 2024). Consequently, these resources are expected to positively influence Basic Psychological Need Satisfaction at Work and serve as motivational foundations for work engagement.

- H5.** AI-Related Technostress negatively affects Basic Psychological Need Satisfaction at Work.
- H6.** Digital Counseling Self-Efficacy positively affects Basic Psychological Need Satisfaction at Work.
- H7.** Psychological Empowerment in AI-Augmented Practice positively affects Basic Psychological Need Satisfaction at Work.
- H8.** Perceived Trust in AI-Assisted Psychological Support positively affects Basic Psychological Need Satisfaction at Work.

2.4 Psychological Need Satisfaction and Work Engagement

The fulfillment of autonomy, competence, and relatedness within professional roles is known as Basic Psychological Need Satisfaction at Work. It is essential for sustaining motivation, psychological functioning, and meaningful work (Autin et al., 2022; Coxen et al., 2021). Digital counseling professionals who feel free to determine how AI should be integrated, competent in evaluating AI-supported information, and emotionally connected with clients despite technology-mediated practice are more likely to demonstrate higher levels of engagement. From the perspective of SDT, the satisfaction of these needs strengthens intrinsic motivation and supports positive work-related states. This argument is also consistent with the JD-R model, which posits that motivational resources are key drivers of vigor, dedication, and absorption (Bakker and de Vries, 2021; Mazzetti et al., 2023). Therefore, it is reasonable to expect that when basic psychological needs are fulfilled, counseling professionals will experience higher levels of work engagement.

- H9.** Basic Psychological Need Satisfaction at Work positively affects Work Engagement.

2.5 Mediating Role of Psychological Need Satisfaction

Basic Psychological Need Satisfaction at Work provides a motivational explanation of how AI-related psychosocial demands and resources translate into work engagement. The JD-R model suggests that job demands may reduce engagement through energy depletion, whereas job resources enhance engagement through motivational pathways (Bakker and de Vries, 2021; Mazzetti et al., 2023). In this study, AI-related technostress is expected to reduce engagement because it may frustrate autonomy, competence, and relatedness by creating anxiety, role ambiguity, and perceived loss of professional control. Conversely, digital counseling self-efficacy, psychological empowerment, and perceived trust in AI-assisted psychological support may strengthen engagement by supporting professionals' sense of capability, agency, and relational security in digital counseling practice.

From the SDT perspective, the satisfaction of autonomy, competence, and relatedness is a central psychological mechanism linking work conditions to positive functioning and meaningful work (Autin et al., 2022; Coxen et al., 2021). Digital counseling self-efficacy may enhance competence, psychological empowerment may reinforce autonomy and professional meaning, and calibrated trust in AI may help preserve confidence and relational continuity when AI is used as a supportive tool rather than a replacement for human judgment (Glikson and Woolley, 2020b; Lucas et al., 2024). Therefore, Basic Psychological Need Satisfaction at Work is expected to mediate the relationships between AI-related technostress, digital counseling self-efficacy, psychological empowerment, perceived trust in AI-assisted psychological support, and work engagement. This mediating logic clarifies why the same AI-assisted environment may weaken or strengthen engagement depending on whether professionals' core psychological needs are frustrated or fulfilled.

- H10.** Basic Psychological Need Satisfaction at Work mediates the relationship between AI-Related Technostress and Work Engagement.
- H11.** Basic Psychological Need Satisfaction at Work mediates the relationship between Digital Counseling Self-Efficacy and Work Engagement.
- H12.** Basic Psychological Need Satisfaction at Work mediates the relationship between Psychological Empowerment in AI-Augmented Practice and Work Engagement.
- H13.** Basic Psychological Need Satisfaction at Work mediates the relationship between Perceived Trust in AI-Assisted Psychological Support and Work Engagement.

2.6 Conceptual Framework

The conceptual framework of this study integrates the Job Demands–Resources Model and Self-Determination Theory to explain how AI-related psychosocial demands and resources shape work engagement in digital counseling. AI-Related Technostress is positioned as a psychosocial job demand that may reduce both Basic Psychological Need Satisfaction at Work and Work Engagement. In contrast, Digital Counseling Self-Efficacy, Psychological Empowerment in AI-Augmented Practice, and Perceived Trust in AI-Assisted Psychological Support are positioned as psychosocial resources that may strengthen need satisfaction and enhance work engagement. Basic Psychological Need Satisfaction at Work serves as the mediating mechanism that links these demands and resources to engagement by explaining how autonomy, competence, and relatedness translate AI-related work experiences into motivational outcomes (Autin et al., 2022; Bakker and de Vries, 2021; Coxen et al., 2021; Mazzetti et al., 2023). The proposed research model is presented in Figure 1.

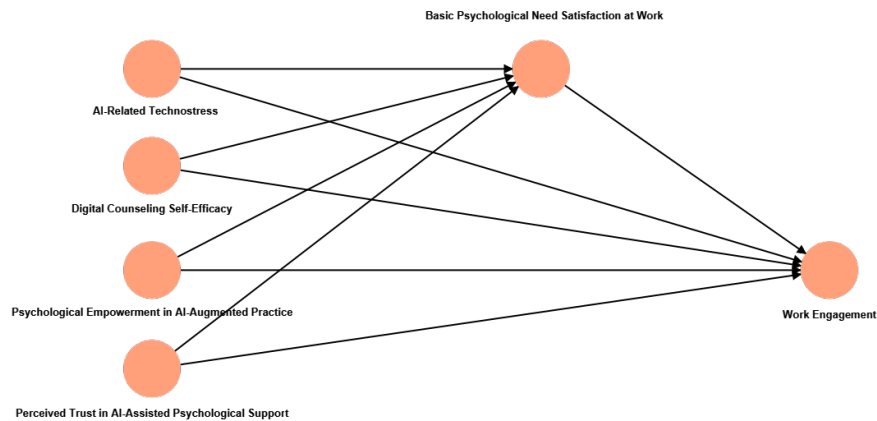


Figure 1. Research Model

This conceptual framework serves as the analytical foundation for the present study, guiding the formulation of testable hypotheses and informing the selection of appropriate analytical procedures. By positioning Basic Psychological Need Satisfaction at Work as the central mediating mechanism, the model captures both the direct influence of AI-related psychosocial demands and resources on work engagement and the indirect pathways through which these factors operate. The integration of JD-R and SDT further enriches the framework by explaining how AI-related work conditions can become either psychologically demanding or motivationally supportive depending on whether they frustrate or satisfy professionals' needs for autonomy, competence, and relatedness. Consequently, this framework provides a structured lens for examining the complex interplay between AI-related technostress, psychosocial resources, psychological need satisfaction, and work engagement in digital counseling.

3. Method

3.1 Research Design

This study used a quantitative explanatory design with a cross-sectional survey. The design was selected to examine how AI-related technostress, digital counseling self-efficacy, psychological empowerment in AI-augmented practice, and perceived trust in AI-assisted psychological support influence work engagement through Basic Psychological Need Satisfaction at Work. The study was grounded in the Job Demands–Resources theory, which explains how job demands and resources shape employee well-being and engagement (Bakker and de Vries, 2021; Mazzetti et al., 2023). AI-related technostress was positioned as a digital job demand, whereas digital counseling self-efficacy, psychological empowerment, and perceived trust in AI-assisted psychological support were treated as psychosocial resources. Basic Psychological Need Satisfaction at Work was included as a mediating construct based on Self-Determination Theory, which emphasizes autonomy, competence, and relatedness as core motivational needs in work settings (Autin et al., 2022; Coxen et al., 2021). A cross-sectional survey approach was appropriate because the study aimed to collect standardized responses from counseling-related professionals and test a theory-driven mediation model involving multiple latent constructs.

3.2 Population and Sampling

This study targeted school counselors, guidance and counseling teachers, and psychology-related counseling practitioners involved in school-based services across Indonesia. A national online sampling method was selected to capture diverse experiences of AI exposure, digital counseling practice, and psychosocial work conditions across educational settings. Since obtaining a complete list of counseling practitioners with AI-related exposure is challenging, the study used purposive snowball sampling with regional quota oversight. Purposive sampling ensured that respondents met specific professional and digital exposure criteria, while snowball sampling expanded recruitment through counseling networks, teacher communities, and professional groups on WhatsApp, Telegram, Facebook, and other online platforms. This strategy is consistent with online and virtual snowball sampling principles for reaching geographically dispersed and networked populations (Baltar and Brunet, 2012; Evans and Mathur, 2005; Safaei, 2021). The final target sample size was 400 respondents, which was considered sufficient for PLS-SEM analysis involving six latent variables and thirty-two observed indicators (Hair et al., 2017; Kock and Hadaya, 2018).

3.3 Research Instrument

The research instrument was developed as a structured, self-administered questionnaire using a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. As presented in Table 1, the instrument consisted of six reflective constructs: AI-Related Technostress, Digital Counseling Self-Efficacy, Psychological Empowerment in AI-Augmented Practice, Perceived Trust in AI-Assisted Psychological Support, Basic Psychological Need Satisfaction at Work, and Work Engagement. The items were adapted from established literature in psychology, occupational health, digital counseling, AI trust, and work engagement to ensure conceptual relevance and measurement clarity. AI-related items were informed by ethical AI and Intelligent-TPACK studies, while psychological need satisfaction and work engagement items were developed

Table 1. Measurement items of research constructs

Variable	Code	Measurement Item	Scale
AI-Related Technostress	ART1	I feel burdened when I have to adjust my counseling practice to keep pace with AI development.	Likert 1–5
AI-Related Technostress	ART2	I feel anxious when AI produces suggestions that may not fit students' psychological conditions.	Likert 1–5
AI-Related Technostress	ART3	The use of AI increases administrative demands in counseling services.	Likert 1–5
AI-Related Technostress	ART4	My professional role becomes less clear when AI is involved in assessment or psychoeducation.	Likert 1–5
AI-Related Technostress	ART5	I feel pressured to continuously learn new technologies to keep up with counseling practice.	Likert 1–5
Digital Counseling Self-Efficacy	DCSE1	I am confident in my ability to use digital tools to support school counseling services.	Likert 1–5
Digital Counseling Self-Efficacy	DCSE2	I can evaluate whether AI outputs align with psychological and counseling principles.	Likert 1–5
Digital Counseling Self-Efficacy	DCSE3	I feel confident using AI to help prepare psychoeducation materials.	Likert 1–5
Digital Counseling Self-Efficacy	DCSE4	I can identify AI limitations before using it in psychological support services.	Likert 1–5
Digital Counseling Self-Efficacy	DCSE5	I can uphold ethical standards, privacy, and data security when using digital counseling tools.	Likert 1–5
Psychological Empowerment in AI-Augmented Practice	PEAI1	The use of AI remains aligned with the meaning of my work as a counselor.	Likert 1–5
Psychological Empowerment in AI-Augmented Practice	PEAI2	I still have control over professional decisions when using AI.	Likert 1–5
Psychological Empowerment in AI-Augmented Practice	PEAI3	I feel competent in selecting AI-generated information relevant to students' needs.	Likert 1–5
Psychological Empowerment in AI-Augmented Practice	PEAI4	AI can expand the impact of the counseling services I provide.	Likert 1–5
Psychological Empowerment in AI-Augmented Practice	PEAI5	I remain the primary professional responsible for counseling decisions.	Likert 1–5
Perceived Trust in AI-Assisted Psychological Support	PTAI1	I trust AI to support counseling work when its outputs are verified by humans.	Likert 1–5
Perceived Trust in AI-Assisted Psychological Support	PTAI2	I trust AI to provide useful preliminary information for psychoeducation.	Likert 1–5
Perceived Trust in AI-Assisted Psychological Support	PTAI3	I trust AI only when its process and limitations are clearly understandable.	Likert 1–5
Perceived Trust in AI-Assisted Psychological Support	PTAI4	AI can be a safe supporting tool when students' data are protected.	Likert 1–5
Perceived Trust in AI-Assisted Psychological Support	PTAI5	AI can support counseling decisions without replacing human empathy.	Likert 1–5
Basic Psychological Need Satisfaction at Work	BPNSW1	I have professional freedom in deciding how to use AI in counseling practice.	Likert 1–5
Basic Psychological Need Satisfaction at Work	BPNSW2	I feel capable of providing effective counseling services in the digital era.	Likert 1–5
Basic Psychological Need Satisfaction at Work	BPNSW3	I remain empathically connected with students when using digital tools.	Likert 1–5
Basic Psychological Need Satisfaction at Work	BPNSW4	My counseling decisions are respected within the school environment.	Likert 1–5
Basic Psychological Need Satisfaction at Work	BPNSW5	AI supports my professional competence rather than weakening it.	Likert 1–5
Basic Psychological Need Satisfaction at Work	BPNSW6	My relationship with students remains humanistic in technology-assisted counseling services.	Likert 1–5
Work Engagement	WE1	I feel energized when providing school counseling services.	Likert 1–5
Work Engagement	WE2	My work as a counselor is deeply meaningful to me.	Likert 1–5
Work Engagement	WE3	I feel enthusiastic about helping students with psychological and academic problems.	Likert 1–5
Work Engagement	WE4	I can fully concentrate when addressing students' counseling needs.	Likert 1–5
Work Engagement	WE5	I remain motivated to provide high-quality services even when counseling work becomes increasingly digitalized.	Likert 1–5
Work Engagement	WE6	I feel proud of my professional role as a school counseling practitioner.	Likert 1–5

based on Self-Determination Theory and the Job Demands–Resources framework (Bakker and de Vries, 2021; Celik, 2023; Coxen et al., 2021; Mazzetti et al., 2023). Higher scores indicate stronger agreement with the psychological states or perceptions represented by each item.

3.4 Data Analysis Procedure

The analysis employed Partial Least Squares Structural Equation Modeling (PLS-SEM) using SmartPLS. The assessment procedure consisted of two main stages: evaluating the measurement model and assessing the structural model. The measurement model was examined for indicator reliability, internal consistency reliability, convergent validity, and discriminant validity using outer loadings, Cronbach's alpha, composite reliability, average variance extracted, and HTMT. The structural model assessment addressed collinearity, path coefficients, coefficient of determination, effect sizes, predictive relevance, and mediation effects. Bootstrapping was used to test the significance of direct and indirect effects. This approach was selected because PLS-SEM is suitable for prediction-focused research involving multiple latent variables, complex relationships, and mediation, particularly in behavioral and psychological studies (Ezeugwa et al., 2022; Hair et al., 2017; Henseler et al., 2024; Kock and Hadaya, 2018).

4. Results

4.1 Respondent Characteristics

Table 2 displays the demographic and professional profiles of the 400 respondents in this study. The majority were female (70.5%), with males accounting for 29.5%. Most respondents were aged 31–40 years (36.5%), followed by 41–50 years (31.0%), 22–30 years (19.5%), and more than 50 years (13.0%). Regarding educational background, most respondents came from Guidance and Counseling (59.5%), followed by

Psychology (23.5%) and Education Counseling or related fields (17.0%). The majority held a bachelor's degree (74.3%), while 25.8% held a master's degree. Professionally, most respondents were guidance and counseling teachers (71.5%), followed by school counselors (18.0%) and educational or clinical psychologists collaborating with schools (10.5%). Respondents worked in junior high schools (30.5%), senior high schools (42.8%), and vocational high schools (26.8%), with most employed in public schools (61.5%). Geographically, Java accounted for the largest proportion (42.0%), followed by Sumatra (17.5%), Sulawesi (13.0%), Kalimantan (10.5%), Bali–Nusa Tenggara (9.5%), and Maluku–Papua (7.5%).

Table 2. Respondent Profile

Characteristic	Category	Frequency	Percentage
Gender	Male	118	29.50%
	Female	282	70.50%
Age	22–30 years	78	19.50%
	31–40 years	146	36.50%
	41–50 years	124	31.00%
	>50 years	52	13.00%
Educational background	Guidance and Counseling	238	59.50%
	Psychology	94	23.50%
	Education Counseling / related field	68	17.00%
Highest education	Bachelor's degree	297	74.30%
	Master's degree	103	25.80%
Professional role	Guidance and counseling teacher	286	71.50%
	School counselor	72	18.00%
	Educational/clinical psychologist collaborating with schools	42	10.50%
School level	Junior high school	122	30.50%
	Senior high school	171	42.80%
	Vocational high school	107	26.80%
School status	Public school	246	61.50%
	Private school	154	38.50%
Work experience	1–5 years	84	21.00%
	6–10 years	112	28.00%
	11–20 years	139	34.80%
	>20 years	65	16.30%
Regional cluster	Sumatra	70	17.50%
	Java	168	42.00%
	Bali–Nusa Tenggara	38	9.50%
	Kalimantan	42	10.50%
	Sulawesi	52	13.00%
	Maluku–Papua	30	7.50%
AI/digital tool exposure	Low exposure	92	23.00%
	Moderate exposure	206	51.50%
	High exposure	102	25.50%
Frequency of AI/digital tool use	Monthly	126	31.50%
	Weekly	196	49.00%
	Daily	78	19.50%
Total		400	100.00%

4.2 Measurement Model Assessment

The measurement model was evaluated through indicator reliability, internal consistency, convergent validity, and discriminant validity analyses. As detailed in Table 3, all indicators showed strong outer loadings between 0.752 and 0.838, confirming that each observed item effectively represented its corresponding latent construct. Indicator reliability values also surpassed the minimum threshold, ranging from 0.566 to 0.702, indicating that the indicators accounted for a sufficient proportion of variance within their constructs. Consequently, no indicators were excluded from the measurement model.

Internal consistency reliability was confirmed, with Cronbach's alpha values ranging from 0.841 to 0.901, rho_A values from 0.852 to 0.901, and rho_C values from 0.886 to 0.924. These findings demonstrate strong internal consistency across all constructs. Convergent validity was assessed using Average Variance Extracted (AVE), with values ranging from 0.609 to 0.669, all exceeding the recommended threshold and indicating that the constructs account for more than half of the variance in their indicators. Consequently, AI-Related Technostress, Basic Psychological Need Satisfaction at Work, Digital Counseling Self-Efficacy, Psychological Empowerment in AI-Augmented Practice, Perceived Trust in AI-Assisted Psychological Support, and Work Engagement all demonstrated acceptable convergent validity.

Discriminant validity was assessed using the HTMT criterion, as presented in Table 4. The HTMT values ranged from 0.049 to 0.553, with the highest value observed between Basic Psychological Need Satisfaction at Work and Work Engagement. All values remained below the

conservative threshold of 0.85, confirming that the constructs are empirically distinct. Figure 2 further illustrates the outer model assessment, indicating that all indicators loaded appropriately onto their respective constructs. Overall, the measurement model demonstrated reliability, convergent validity, and discriminant validity, supporting the next phase of structural model analysis.

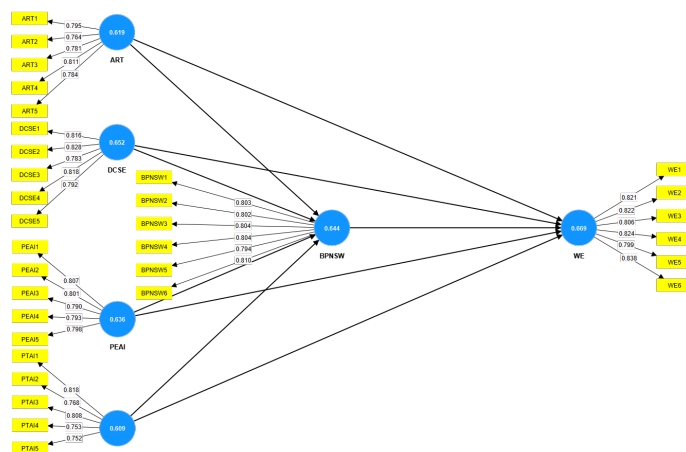


Figure 2. Outer Model Assessment

As illustrated in Figure 2, the outer model assessment demonstrates the relationship between each latent construct and its corresponding indicators. The figure shows that all indicators loaded appropriately onto their respective constructs, indicating successful measurement of AI-related technostress, basic psychological need satisfaction at work, digital counseling self-efficacy, psychological empowerment in AI-augmented practice, perceived trust in AI-assisted psychological support, and work engagement. As shown in Table 3, the outer loading values were consistently above the recommended minimum, confirming reliable indicator measurement across all constructs. Therefore, the outer model demonstrates the statistical reliability of the measurement indicators and their conceptual alignment with the constructs they represent, supporting the model's suitability for further structural assessment.

Table 3. Reliability and Validity Results

Construct	Indicator	Outer Loading	Indicator Reliability	Cronbach's Alpha	rho_A	rho_C	AVE
AI-Related Technostress (ART)	ART1	0.795	0.632	0.847	0.852	0.890	0.619
	ART2	0.764	0.584				
	ART3	0.781	0.610				
	ART4	0.811	0.658				
	ART5	0.784	0.615				
Basic Psychological Need Satisfaction at Work (BPNSW)	BPNSW1	0.804	0.646	0.890	0.890	0.916	0.644
	BPNSW2	0.802	0.643				
	BPNSW3	0.803	0.645				
	BPNSW4	0.807	0.651				
	BPNSW5	0.791	0.626				
	BPNSW6	0.809	0.654				
Digital Counseling Self-Efficacy (DCSE)	DCSE1	0.816	0.666	0.867	0.873	0.904	0.652
	DCSE2	0.828	0.686				
	DCSE3	0.783	0.613				
	DCSE4	0.818	0.669				
	DCSE5	0.792	0.627				
Psychological Empowerment in AI-Augmented Practice (PEAI)	PEAI1	0.805	0.648	0.858	0.864	0.897	0.636
	PEAI2	0.805	0.648				
	PEAI3	0.782	0.612				
	PEAI4	0.795	0.632				
	PEAI5	0.800	0.640				
Perceived Trust in AI-Assisted Psychological Support (PTAI)	PTAI1	0.818	0.669	0.841	0.853	0.886	0.609
	PTAI2	0.768	0.590				
	PTAI3	0.808	0.653				
	PTAI4	0.753	0.567				
	PTAI5	0.752	0.566				
Work Engagement (WE)	WE1	0.821	0.674	0.901	0.901	0.924	0.669
	WE2	0.822	0.676				
	WE3	0.806	0.650				
	WE4	0.824	0.679				
	WE5	0.798	0.637				
	WE6	0.838	0.702				

Note. Indicator reliability was obtained by squaring the standardized outer loading. ART = AI-Related Technostress; BPNSW = Basic Psychological Need Satisfaction at Work; DCSE = Digital Counseling Self-Efficacy; PEA1 = Psychological Empowerment in AI-Augmented Practice; PTA1 = Perceived Trust in AI-Assisted Psychological Support; WE = Work Engagement; rho_A = composite reliability rho_A; rho_C = composite reliability rho_C; AVE = average variance extracted.

Table 4. HTMT

Construct	ART	BPNSW	DCSE	PEAI	PTAI	WE
ART	—					
BPNSW	0.334	—				
DCSE	0.097	0.342	—			
PEAI	0.086	0.240	0.049	—		
PTAI	0.090	0.188	0.076	0.051	—	
WE	0.234	0.553	0.254	0.286	0.213	—

4.3 Descriptive Statistics

Table 5 presents the descriptive statistics and inter-construct correlations among the latent variables. The mean scores ranged from 2.990 to 3.030, indicating that respondents generally reported moderate levels of AI-related technostress, psychosocial resources, psychological need satisfaction, and work engagement. The standard deviation values ranged from 0.755 to 0.798, suggesting acceptable variability in respondents' perceptions. The correlation results show that AI-Related Technostress was negatively associated with Basic Psychological Need Satisfaction at Work and Work Engagement, supporting its role as a psychosocial demand. In contrast, Digital Counseling Self-Efficacy, Psychological Empowerment in AI-Augmented Practice, and Perceived Trust in AI-Assisted Psychological Support were positively correlated with BPNSW and WE. The strongest correlation was observed between BPNSW and WE, indicating that higher psychological need satisfaction was moderately associated with stronger work engagement. Overall, the correlations were low to moderate, suggesting that the constructs were related in theoretically meaningful ways without indicating excessive overlap.

The collinearity analysis in Tables 6 and 7 shows that the structural model was not affected by problematic multicollinearity. As indicated in Table 6, all VIF values for vertical collinearity ranged from 1.002 to 1.360, with the highest value for the BPNSW → WE path. These values are well below the conservative cutoff of 3.30, indicating minimal overlap among predictor constructs in estimating endogenous variables. Table 7 further supports this result, with maximum VIF values ranging from 1.046 to 1.360 at the construct level. Consequently, the structural estimates are reliable, and the path coefficients are not compromised by multicollinearity among predictors.

Table 5. Descriptive Statistics and Inter-Construct Correlations

Construct	Mean	SD	ART	BPNSW	DCSE	PEAI	PTAI	WE
ART	3.013	0.772	1					
BPNSW	2.990	0.773	-0.295	1				
DCSE	3.030	0.798	0.071	0.301	1			
PEAI	2.992	0.784	0.025	0.211	0.038	1		
PTAI	2.993	0.755	0.055	0.170	0.039	-0.001	1	
WE	3.004	0.781	-0.208	0.495	0.228	0.254	0.187	1

Note. ART = AI-Related Technostress; BPNSW = Basic Psychological Need Satisfaction at Work; DCSE = Digital Counseling Self-Efficacy; PEA I = Psychological Empowerment in AI-Augmented Practice; PTA I = Perceived Trust in AI-Assisted Psychological Support; WE = Work Engagement; SD = standard deviation.

Table 6. Vertical Collinearity Assessment

Structural Path	VIF	Decision
ART → BPNSW	1.008	No collinearity issue
DCSE → BPNSW	1.008	No collinearity issue
PEAI → BPNSW	1.002	No collinearity issue
PTAI → BPNSW	1.004	No collinearity issue
ART → WE	1.158	No collinearity issue
BPNSW → WE	1.360	No collinearity issue
DCSE → WE	1.138	No collinearity issue
PEAI → WE	1.061	No collinearity issue
PTAI → WE	1.046	No collinearity issue

Note. VIF = variance inflation factor. All VIF values were below 3.30, indicating that vertical collinearity among predictor constructs was not problematic.

Table 7. Full Collinearity Assessment

Construct	Maximum VIF	Decision
ART	1.158	No collinearity issue
BPNSW	1.360	No collinearity issue
DCSE	1.138	No collinearity issue
PEAI	1.061	No collinearity issue
PTAI	1.046	No collinearity issue

Note. Full collinearity VIF values were calculated at the construct level to assess potential common method-related collinearity. All values were below the conservative threshold of 3.30, suggesting that full collinearity was not a concern.

4.4 Structural Model Assessment

The structural model was evaluated using path coefficients, coefficient of determination, predictive relevance, effect size, and mediation analysis. Figure 3 illustrates the assessment of the inner model, highlighting the relationships among AI-Related Technostress, Digital Counseling Self-Efficacy, Psychological Empowerment in AI-Augmented Practice, Perceived Trust in AI-Assisted Psychological Support, Basic Psychological Need Satisfaction at Work, and Work Engagement. As shown in Table 8, all proposed direct effects were statistically significant. AI-Related Technostress negatively influenced Basic Psychological Need Satisfaction at Work and Work Engagement, while Digital Counseling Self-Efficacy, Psychological Empowerment in AI-Augmented Practice, and Perceived Trust in AI-Assisted Psychological Support positively affected these constructs. Basic Psychological Need Satisfaction at Work also had a strong positive effect on Work Engagement. Table 9 indicates that the model explained 26.5% of the variance in Basic Psychological Need Satisfaction at Work and 30.1% of the variance in Work Engagement. Predictive relevance was confirmed because all Q^2 redundancy and Q^2 predict values for endogenous constructs exceeded zero. As shown in Table 10, effect sizes ranged from very small to small, with the most substantial effects observed for ART → BPNSW and BPNSW → WE. Finally, Table 11 demonstrates that Basic Psychological Need Satisfaction at Work significantly mediated the effects of ART, DCSE, PEAI, and PTAI on Work Engagement, underscoring the importance of psychological need satisfaction as a motivational mechanism in the model.

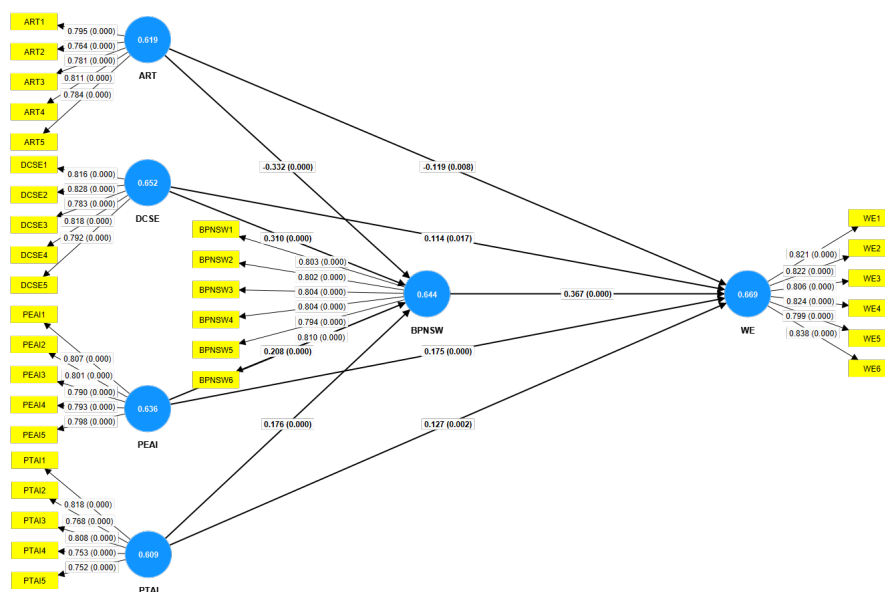


Figure 3. Inner Model Assessment

Figure 3 illustrates the structural model showing standardized path coefficients among ART, DCSE, PEAI, PTAI, BPNSW, and WE. The model reports R^2 values of 0.265 for BPNSW and 0.301 for WE, indicating the explanatory power of the exogenous constructs and mediator.

Table 8. Direct Effects and Path Coefficients

Hypothesis	Structural Path	β	STDEV	t-value	p-value	95% CI
H1	ART → WE	-0.119	0.045	2.666	0.008	[-0.205, -0.035]
H2	DCSE → WE	0.114	0.048	2.391	0.017	[0.023, 0.209]
H3	PEAI → WE	0.175	0.042	4.217	<0.001	[0.095, 0.258]
H4	PTAI → WE	0.127	0.041	3.074	0.002	[0.047, 0.210]
H5	ART → BPNSW	-0.332	0.041	8.187	<0.001	[-0.411, -0.255]
H6	DCSE → BPNSW	0.310	0.039	7.906	<0.001	[0.232, 0.388]
H7	PEAI → BPNSW	0.208	0.043	4.825	<0.001	[0.122, 0.295]
H8	PTAI → BPNSW	0.176	0.041	4.258	<0.001	[0.094, 0.258]
H9	BPNSW → WE	0.367	0.043	8.515	<0.001	[0.278, 0.448]

Note. ART = AI-Related Technostress; DCSE = Digital Counseling Self-Efficacy; PEAI = Psychological Empowerment in AI-Augmented Practice; PTAI = Perceived Trust in AI-Assisted Psychological Support; BPNSW = Basic Psychological Need Satisfaction at Work; WE = Work Engagement; CI = confidence interval.

Table 9. Coefficient of Determination and Predictive Relevance

Endogenous Construct	R^2	Adjusted R^2	Q^2 Redundancy	Q^2 predict	RMSE	MAE
BPNSW	0.265	0.257	0.167	0.241	0.876	0.700
WE	0.301	0.292	0.197	0.179	0.912	0.730

Note. BPNSW = Basic Psychological Need Satisfaction at Work; WE = Work Engagement; Q^2 redundancy was obtained from blindfolding, while Q^2 predict, RMSE, and MAE were obtained from PLSpredict/CVPAT output. Values of Q^2 above zero indicate predictive relevance.

Table 10. Effect Size Assessment

Structural Path	f^2	Effect Size Interpretation
ART → BPNSW	0.148	Small, approaching medium
DCSE → BPNSW	0.129	Small, approaching medium
PEAI → BPNSW	0.059	Small
PTAI → BPNSW	0.042	Small
ART → WE	0.017	Very small
BPNSW → WE	0.142	Small, approaching medium
DCSE → WE	0.016	Very small
PEAI → WE	0.041	Small
PTAI → WE	0.022	Small

Note. f^2 indicates the relative contribution of each predictor to the explained variance of the endogenous construct.

Table 11. Mediation Effects of Basic Psychological Need Satisfaction at Work

Hypothesis	Indirect Path	Indirect Effect	STDEV	t-value	p-value	95% CI
H10	ART → BPNSW → WE	-0.122	0.021	5.888	<0.001	[-0.165, -0.084]
H11	DCSE → BPNSW → WE	0.114	0.019	5.920	<0.001	[0.077, 0.154]
H12	PEAI → BPNSW → WE	0.076	0.018	4.146	<0.001	[0.043, 0.114]
H13	PTAI → BPNSW → WE	0.065	0.017	3.789	<0.001	[0.033, 0.100]

4.5 Hypothesis Testing Summary

The results of the hypothesis tests are presented in Table 12. All hypotheses were generally supported. The direct effects reveal that AI-Related Technostress negatively affected both Basic Psychological Need Satisfaction at Work and Work Engagement. Conversely, Digital Counseling Self-Efficacy, Psychological Empowerment in AI-Augmented Practice, Perceived Trust in AI-Assisted Psychological Support, and Basic Psychological Need Satisfaction at Work all demonstrated significant positive effects as expected. Additionally, mediation analysis showed that Basic Psychological Need Satisfaction at Work played a significant role in mediating the relationships between AI-related psychosocial demands and resources and Work Engagement. These results highlight that psychological need satisfaction is a key motivational mechanism linking AI-related work experiences to engagement outcomes in digital counseling.

Table 12. Summary of Hypothesis Testing

Hypothesis	Relationship	Effect Type	Coefficient	t-value	p-value	Result
H1	ART → WE	Direct effect	-0.119	2.666	0.008	Supported
H2	DCSE → WE	Direct effect	0.114	2.391	0.017	Supported
H3	PEAI → WE	Direct effect	0.175	4.217	<0.001	Supported
H4	PTAI → WE	Direct effect	0.127	3.074	0.002	Supported
H5	ART → BPNSW	Direct effect	-0.332	8.187	<0.001	Supported
H6	DCSE → BPNSW	Direct effect	0.310	7.906	<0.001	Supported
H7	PEAI → BPNSW	Direct effect	0.208	4.825	<0.001	Supported
H8	PTAI → BPNSW	Direct effect	0.176	4.258	<0.001	Supported
H9	BPNSW → WE	Direct effect	0.367	8.515	<0.001	Supported
H10	ART → BPNSW → WE	Indirect effect	-0.122	5.888	<0.001	Supported
H11	DCSE → BPNSW → WE	Indirect effect	0.114	5.920	<0.001	Supported
H12	PEAI → BPNSW → WE	Indirect effect	0.076	4.146	<0.001	Supported
H13	PTAI → BPNSW → WE	Indirect effect	0.065	3.789	<0.001	Supported

5. Discussion

This study explored how AI-related psychosocial demands and resources influence work engagement through the satisfaction of basic psychological needs in digital counseling. The findings support integrating the Job Demands-Resources (JD-R) model and Self-Determination Theory (SDT), indicating that AI-related technostress functions as a job demand, whereas digital counseling self-efficacy, psychological empowerment, and perceived trust in AI-assisted psychological support serve as psychosocial resources. More importantly, basic psychological need satisfaction at work emerged as a key motivational mechanism linking AI-related work experiences to work engagement.

The negative effect of AI-related technostress on work engagement suggests that AI does not automatically enhance professional functioning when it is experienced as a psychological burden. In digital counseling, technostress may arise from the need to continuously learn new technologies, evaluate AI-generated outputs, manage ethical uncertainty, and ensure the quality of human-centered psychological support. These pressures can deplete cognitive and emotional resources, thereby reducing vigor, dedication, and absorption. This finding is consistent with the JD-R model, which explains that job demands weaken engagement when they exhaust psychological resources (Bakker and de Vries, 2021; Mazzetti et al., 2023). It also aligns with technostress research showing that technology overload, uncertainty, and complexity can undermine well-being and occupational functioning (Baumeister et al., 2021; Dragano and Lunau, 2020; Nisafani et al., 2020). For counseling professionals, such pressure is particularly important because they must preserve empathy, confidentiality, and professional judgment while adapting to digital systems.

The positive effect of Digital Counseling Self-Efficacy on Work Engagement and basic psychological needs Satisfaction indicates that confidence in using digital or AI-assisted tools is an important adaptive resource. Professionals who believe they can evaluate AI outputs,

identify system limitations, and uphold ethical standards are more likely to feel competent rather than helpless in AI-mediated work. This finding supports previous studies showing that technological self-efficacy strengthens motivation, adaptive learning, and readiness in digital environments (Chiu et al., 2025; Pan, 2020). In digital counseling, self-efficacy may also reduce avoidance behavior and increase professional readiness to use AI as a supportive tool rather than as a threat to professional practice.

Psychological empowerment in AI-augmented practice also strengthened Work Engagement and basic psychological need satisfaction. This finding suggests that AI-supported counseling becomes psychologically sustainable when professionals perceive their roles as meaningful, autonomous, and impactful. Empowerment allows counseling professionals to interpret AI not as a replacement for professional judgment, but as a tool that can expand service capacity and support decision-making. This interpretation is consistent with psychological empowerment literature, which links empowerment with meaning, competence, self-determination, and positive work outcomes (Gong et al., 2020; Llorente-Alonso et al., 2024). It also resonates with work design perspectives that emphasize that automation and algorithmic systems should be structured to preserve human control and professional agency (Parker and Grote, 2022).

Perceived trust in AI-assisted psychological support was also positively associated with work engagement and basic psychological need satisfaction. This result indicates that trust is most beneficial when calibrated, transparent, and supported by human verification. In counseling contexts, trust in AI cannot be reduced to simple technological acceptance; it must involve awareness of reliability, limitations, privacy, and ethical responsibility. This finding is consistent with human trust in AI research, which emphasizes that appropriate trust depends on transparency, reliability, and the quality of human-AI interaction (Glikson and Woolley, 2020b; Lucas et al., 2024). It also supports ethical AI perspectives, arguing that AI use in education and psychological support requires human oversight, accountability, and careful assessment of risks such as bias and harm (Adams et al., 2023; Celik, 2023; Holmes et al., 2022).

A central finding of this study is that satisfaction of basic psychological needs at work significantly enhances work engagement. This result supports SDT by showing that professionals become more engaged when they experience autonomy, competence, and relatedness in their work (Autin et al., 2022; Coxen et al., 2021). In digital counseling, autonomy refers to professional discretion in deciding how AI should be used; competence refers to feeling capable of evaluating and applying AI-supported information; and relatedness refers to maintaining empathic human connection despite technological mediation. These needs are particularly important because counseling is not merely informational work, but also relational and ethically sensitive work. When these needs are satisfied, AI-supported practice can strengthen rather than weaken engagement.

The mediation findings reinforce this interpretation. Basic psychological need satisfaction at Work mediated the relationship between AI-related technostress and work engagement, suggesting that technostress reduces engagement, in part, by undermining autonomy, competence, and relatedness. When AI introduces uncertainty, role ambiguity, or a perceived loss of control, professionals may feel less psychologically connected to their work, thereby weakening engagement. Conversely, basic psychological need satisfaction also mediated the effects of Digital Counseling Self-Efficacy, psychological empowerment, and Perceived Trust in AI-assisted psychological support on work engagement. This indicates that these psychosocial resources not only influence engagement directly; they also enhance engagement by helping professionals feel capable, autonomous, and relationally secure in digital counseling practice.

These findings contribute to the literature by showing that AI integration in counseling should be understood as a psychological work-design issue rather than merely a matter of technological readiness. Previous studies have highlighted the potential of AI-supported mental health tools and digital interventions (Abd-Alrazaq et al., 2020; Boucher et al., 2021), but the present model clarifies that such tools affect professionals through motivational and psychosocial mechanisms. The study also extends Intelligent-TPACK and ethical AI perspectives by shifting attention from knowledge and technical integration to psychological resources, need satisfaction, and engagement (Celik, 2023). Overall, the findings indicate that sustainable AI use in digital counseling depends on reducing technostress and strengthening self-efficacy, empowerment, trust, and satisfaction of basic psychological needs as foundations for engaged professional practice.

6. Conclusion

This study concludes that AI-related psychosocial conditions significantly shape work engagement in digital counseling. AI-Related technostress was found to reduce both basic psychological need satisfaction at work and work engagement, indicating that AI can function as a psychological job demand when it generates pressure, uncertainty, and role ambiguity. In contrast, Digital Counseling Self-Efficacy, Psychological Empowerment in AI-Augmented Practice, and Perceived Trust in AI-Assisted Psychological Support strengthened psychological need satisfaction and work engagement, demonstrating their role as important psychosocial resources in AI-supported counseling practice. Basic Psychological Need Satisfaction at Work emerged as a central motivational mediator linking AI-related technostress, self-efficacy, empowerment, and trust to work engagement. These findings support integrating the Job Demands–Resources Model and Self-Determination Theory by showing that sustainable AI adoption in digital counseling depends not only on technological readiness but also on professionals' autonomy, competence, relatedness, and perceived control. Overall, this study emphasizes that AI implementation in counseling should be designed to minimize technostress while strengthening psychological resources that enable professionals to remain engaged, ethical, and human-centered in their work.

7. Limitations and Future Research

This study has several limitations that should be acknowledged. First, the study employed a cross-sectional design, which limits the ability to establish causal relationships among AI-related technostress, psychosocial resources, basic psychological need satisfaction, and work engagement. Although the proposed framework was theoretically grounded in the Job Demands–Resources Model and Self-Determination Theory, the direction of influence among the constructs should be interpreted with caution. Future research should consider longitudinal or time-lagged designs to examine whether AI-related technostress and psychosocial resources produce sustained changes in psychological need satisfaction and work engagement over time.

Second, the data were collected using self-report questionnaires, which may be influenced by common method bias, social desirability bias, and respondents' subjective perceptions of AI-assisted counseling practice. Although the measurement model demonstrated strong reliability and validity, future studies could strengthen the robustness of the findings by using multiple data sources, such as supervisor evaluations, behavioral indicators of digital tool use, interview transcripts, or observational data from counseling sessions. Mixed-method approaches may also provide deeper insights into how counseling professionals experience autonomy, competence, relatedness, trust, and stress when working with AI-supported tools.

Third, this study treated AI-assisted psychological support as a broad digital counseling phenomenon without differentiating specific AI tools, platforms, or levels of algorithmic complexity. In real-world practice, professionals may respond differently to generative AI, chatbots, automated

assessment tools, recommendation systems, or learning analytics platforms. Future studies should compare different types of AI-assisted technologies and investigate whether transparency, perceived reliability, privacy features, and human oversight influence psychological outcomes in different ways. Additional contextual variables, such as ethical AI climate, organizational support, digital leadership, professional training quality, and regulatory literacy, may also be incorporated to clarify when AI functions as a psychosocial resource rather than a job demand.

Finally, the present model focused on Basic Psychological Need Satisfaction at Work as the central mediating mechanism. While the findings confirm its importance, future research could extend the model by examining additional psychological mechanisms, such as emotional exhaustion, professional identity threat, digital resilience, moral distress, and perceived human–AI role clarity. Future studies could also examine moderating variables that may condition the strength of the proposed relationships, including AI literacy, counseling experience, organizational readiness, age, gender, and professional background. These extensions would provide a more comprehensive understanding of how AI can be integrated into counseling practice in ways that protect professional well-being while sustaining engagement, ethical judgment, and human-centered psychological support.

Ethical Statement

This study was conducted in accordance with ethical principles for research involving human participants. Ethical approval was obtained from the relevant institutional research ethics committee prior to data collection. All participants provided informed consent after receiving a full explanation of the study's purpose, procedures, voluntary nature of participation, and assurances of confidentiality and anonymity. Participants were informed of their right to withdraw from the study at any time without consequence. The study adhered to the ethical guidelines outlined in the Declaration of Helsinki and the standards established by the Committee on Publication Ethics (COPE). All data were handled confidentially, stored securely, and used exclusively for research purposes. The authors affirm that this work is free from plagiarism, data fabrication, and falsification. Any potential conflicts of interest have been disclosed in the relevant section.

Informed Consent Statement

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors. The study was conducted as a collaborative academic effort between the authors without external financial support. All costs associated with data collection, questionnaire administration, data analysis, manuscript preparation, and publication were borne independently by the authors through their institutional affiliation with the Department of Psychology, Faculty of Psychology, Universitas 45 Surabaya, Surabaya, Indonesia.

Author Contributions

Yanifa Anya: Conceptualization, methodology, formal analysis, investigation, writing—original draft, writing—review and editing, project administration, resources, and corresponding author.

Zenis Fadhilah: Conceptualization, methodology, data curation, investigation, writing—review and editing, visualization, validation, and software.

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Data Availability Statement

The data supporting the findings of this study were collected through self-administered questionnaires distributed to counseling professionals, school counselors, psychology practitioners, and education-related respondents with experience or awareness of AI-assisted psychological support and digital counseling practices. The raw data contain potentially identifiable participant information and are not publicly available due to ethical restrictions, institutional ethical clearance requirements, and confidentiality agreements specified in the informed consent procedure. Anonymized datasets, including item-level responses, construct scores, and analytical outputs generated during this study, are available from the corresponding author upon reasonable request. Any additional materials, such as the structured questionnaire, coding schemes, and SmartPLS project files, may be shared for academic purposes subject to institutional ethical clearance and the terms of the original consent agreements. All literature sources cited in this study are publicly accessible via their respective digital object identifiers (DOIs) provided in the reference section.

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Conflict of Interest

The authors declare that no conflict of interest exists in relation to the conduct and publication of this research. No financial, personal, or professional affiliations have influenced the design, data collection, analysis, interpretation, or reporting of this study. All authors contributed to the manuscript independently, without external interference or competing interests that could compromise the objectivity and integrity of the findings presented.



Declaration of Generative AI and AI-Assisted Technologies

The authors used ChatGPT as an editorial support tool solely to assist with language refinement, grammar correction, and sentence structure improvement. The AI tool was not used to generate research ideas, hypotheses, data, analysis, or findings. All AI-assisted content was thoroughly reviewed, verified, revised, and approved by the authors. The authors take full responsibility for the accuracy, integrity, originality, and ethical compliance of the final manuscript.

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