

The Impact of Technology Anxiety on Nurses' Acceptance of the Italian National Artificial Intelligence Platform for Primary Care

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Background

The Italian National Agency for Regional Healthcare Services (AGENAS)¹ will launch the “Italian National Artificial Intelligence Platform (INAIP)” to enhance primary healthcare in Italy. This initiative, part of the National Recovery and Resilience Plan (NRRP)², aims supporting primary care professionals in prevention, diagnostic, care and administrative tasks. Its overarching goal is to increase the capabilities of the Italian primary care providers while facilitating the accessibility and utilization of primary healthcare services by patients.

The competitive dialogue procedure³ for awarding the contract related to the design, the implementation and the management of the AI platform includes a detailed change management plan. This approach should enhance engagement and autonomy among health professionals, ensuring the acceptance of this new tool.

Successfully implementing AI in health-related tasks relies on the active involvement of health professionals, who are the primary users of these technologies (1). Among health professionals, nurses have been viewed as a key in the future of care (2) for addressing the shortage of clinicians. For this reason, their role and their profession is strictly intertwined with digital innovation (3,4).

Nonetheless, there has been limited research exploring the perspectives and attitudes of nurses towards AI and their willingness to adopt it (5–9). The few recent studies highlighted a contradictory perception of nurses towards AI. While nurses recognized its potential in the early detection of critical medical indicators, they claimed its uselessness in providing empathy and compassion care to patients (5). Moreover, they reported a sense of anxiety in thinking to adopt AI in their daily practice, since they did not have the skill to do so (10).

Building on Technology Acceptance Model (TAM) (11,12), this research sheds new and robust evidence concerning both technological and technology-anxiety-related factors affecting AI acceptance by nurses. This is particularly relevant in the current scenario of AI rapid disruption in healthcare (13). In this direction, this study provides practical guidelines and avenues of

¹ For further information: <https://www.agenas.gov.it/comunicazione/primo-piano/2157-piattaforma-di-intelligenza-artificiale-a-supporto-dell'assistenza-sanitaria-primaria-pubblicazione-dell-avviso-di-dialogo-competitivo> (last checked: June 3rd 2024)

² For further information: https://commission.europa.eu/business-economy-euro/economic-recovery/recovery-and-resilience-facility/country-pages/italys-recovery-and-resilience-plan_en (last checked: June 3rd 2024)

³ For further information: <https://www.agenas.gov.it/bandi-di-gara-e-contratti/avvisi-bandi-e-inviti/gare-in-corso/2158-avviso-di-indizione-di-una-procedura-di-dialogo-competitivo-per-l'affidamento-di-un-contratto-avente-ad-oggetto-la-progettazione-di-dettaglio,-la-realizzazione,-la-messa-in-esercizio-e-la-gestione-di-una-piattaforma-di-intelligenza-artificiale-a-supporto-dell'assistenza-sanitaria-primaria-ai-sensi-dell'art-64-del-d-lgs-n-50-2016-cig-94572555b6> (last checked: June 3rd 2024)

research for facilitating the adoption of the upcoming platform for AI in Italy, as well as in other countries.

Objective

The objective of this study is to investigate the role of technology anxiety on the intention to use a national AI-based platform among Italian nurses, within the framework of the Technology Acceptance Model (TAM). In doing so, we developed three hypotheses.

According to Davis (11), perceived usefulness and perceived ease of use are the two salient dominant factors in explaining the intention to use a new technology. The relevance of these factors was confirmed by recent studies investigating the drivers that facilitated physicians in using AI. This leads to Hypotheses 1 and 2 (14):

HP1: Perceived ease of use positively affects intention to use of INAIP among Italian nurses.

HP2: Perceived usefulness positively affects intention to use of INAIP among Italian nurses.

Technology anxiety derived from computer anxiety: “the fear, apprehension and hope people feel when considering use or actually using computer technology” (15). Differently from the computer anxiety, technology anxiety refers to general technologies, with a broader meaning (16).

This state of mind proved to influence the intention to use. Whilst this factor has never been tested on AI, its influence toward the intention to use a new technology is widely recognized (17), which leads to Hypothesis 3:

HP3: Technology anxiety positively affects intention to use of INAIP among Italian nurses

The research model is shown in Figure 1.

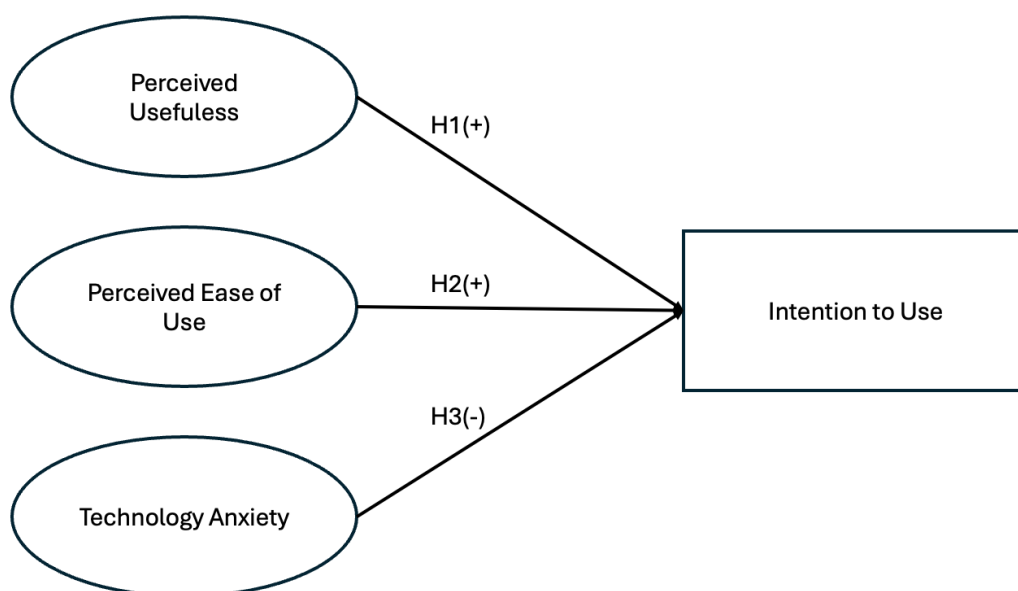


Figure 1: Research model

Methodology

To test our hypotheses, the linear relationships and effects among variables was investigated through Structural Equation Modeling (SEM) (18). Age was considered as a control variable, while perceived usefulness, perceived ease of use and technology anxiety were endogenous variables. An online survey was administered through email and sent to Italian nurses between March and April 2024 in collaboration with the National Federation for Italian Nurses (FNOPI), in compliance with the European privacy regulation (GDPR). Completion required about 10 minutes and participation was completely voluntary.

In first section of the survey, a reference use case of the INAIP was provided as a reference for respondents (i.e., an Artificial Intelligence solution to support monitoring and re-evaluating patients with chronic conditions). The second section included demographic variables, such as age, and the scales of the three constructs, which were adapted from (12) and (19). The scales were formatted in 7-point Linkert Scale. 974 complete answers were gathered.

Main results

The model demonstrates a strong goodness of fit, as indicated by a CFI of 0.975, a TLI of 0.968, and an RMSEA of 0.070. As shown in Table 1, our results confirm the three initial hypotheses. The study reaffirms the TAM, highlighting the importance of ease of use and usefulness in AI adoption among nurses.

Variable	Coefficient	Std. Err.	P>0
Age	0.008	0.018	0.661
Perceived Ease of Use	0.266	0.117	0.023
Perceived Usefulness	0.258	0.104	0.014
Technology Anxiety	-0.354	0.040	0.000

Table 1: SEM estimation main results

However, AI adoption transcends rational choices dictated by TAM. Technology anxiety is a critical factor, particularly relevant given AI's complex and ‘opaque’ nature (20). This anxiety can significantly impede the effective integration of AI in healthcare settings. Therefore, in implementing the Italian project of a national AI platform for primary care, we suggest targeting technology anxiety in the change management process as pivotal element to ensure acceptance and therefore successful implementation.

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