

# Relationship between work productivity and patient safety attitudes among intensive and critical care nurses: A structural equation modelling approach

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## Abstract

**Background:** Intensive care units present various challenges that can affect the productivity of nurses who play a critical role in ensuring patient safety; however, the relationship between these nurses' work productivity and patient safety attitudes has not been sufficiently explored.

**Aim:** To investigate the relationship between work productivity and patient safety attitudes among intensive and critical care nurses (ICCNs) using structural equation modelling (SEM).

**Study Design:** This cross-sectional study involved 372 ICCNs who were members of the Turkish Society of Critical Care Nurses. Data were collected via an online survey using the Nurse Information Form, the Attitudes Toward Productivity Scale (ATPS) and the Patient Safety Attitude Questionnaire (PSAQ).

**Results:** A significant positive correlation was found between the total ATPS and the PSAQ score ( $r = .704, p < .01$ ). The SEM analysis revealed that teamwork climate ( $\beta = .192, p = .001$ ), perceptions of management ( $\beta = .141, p = .001$ ) and job satisfaction ( $\beta = .482, p = .001$ ) positively predicted attitudes towards productivity, while stress recognition had a negative impact ( $\beta = -.219, p = .001$ ). The model accounted for 62.2% of the variance in attitudes towards productivity and demonstrated good fit indices ( $\chi^2/df = 3.566$ ; GFI = 0.989; CFI = 0.991; RMSEA = 0.078).

**Conclusions:** Teamwork climate, perceptions of management, job satisfaction and stress recognition significantly influence work productivity among ICCNs. Enhancing these factors can improve ICCNs' productivity and foster positive patient safety attitudes, ultimately leading to better patient care outcomes in intensive care settings.

**Relevance to Clinical Practice:** Health care institutions need to adopt strategies to increase ICCNs' work productivity and patient safety attitudes, such as teamwork support initiatives, leadership development programmes for managers, professional development opportunities and stress reduction interventions. Positive working

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environment and favourable working conditions can improve ICCNs' well-being and performance, leading to better patient care outcomes in intensive care settings.

#### KEYWORDS

critical care, intensive care nurses, intensive care unit, patient safety, work productivity

## 1 | INTRODUCTION

Intensive care units (ICUs) represent some of the most challenging environments in health care, where patients with life-threatening conditions require continuous, complex and highly specialized care.<sup>1</sup> Intensive and critical care nurses (ICCNs) play a pivotal role in patient outcomes because of their close monitoring, rapid decision-making and co-ordination with multidisciplinary teams.<sup>2</sup> The demanding nature of these units not only tests the clinical skills of ICCNs but also places significant pressure on their work productivity and attitudes towards patient safety.<sup>3</sup>

Work productivity in nursing is a multifaceted concept that extends beyond mere task completion; it encompasses the efficiency, effectiveness and quality of care provided.<sup>4,5</sup> Organizational factors such as working conditions, job demands and teamwork dynamics significantly influence nurses' productivity.<sup>6,7</sup> A supportive work environment that fosters collaboration, provides adequate resources and recognizes nurses' contributions has the potential to significantly enhance their motivation and commitment, which in turn can lead to improved productivity.<sup>8-10</sup> Conversely, factors such as an excessive workload, insufficient staffing and a lack of support can precipitate stress and burnout, which in turn impede nurses' capacity to deliver safe and effective care.<sup>11,12</sup>

The impact of nurses' work productivity extends directly to patient safety. High productivity levels enable nurses to monitor patients more effectively, adhere strictly to safety protocols and respond promptly to changes in patients' conditions, thereby reducing the risk of adverse events.<sup>13,14</sup> However, negative organizational factors that impede productivity can have a deleterious impact on patient safety, increasing the probability of errors and compromising the quality of care provided.<sup>15-17</sup> Studies have demonstrated that inadequate staffing ratios and excessive workloads are associated with increased fatigue and burnout, which in turn are linked to elevated rates of medical errors.<sup>18,19</sup> Similarly, deficiencies in teamwork and communication can result in misunderstandings and delays in critical interventions.<sup>20,21</sup>

Despite the critical importance of these issues, there is a notable gap in the existing literature regarding the interplay between work productivity and patient safety attitudes among ICCNs. The extant literature frequently examines these concepts separately, thereby failing to provide a comprehensive analysis of the impact of factors related to productivity on patient safety attitudes within the ICU context. A deeper understanding of these interconnected factors is essential for health care administrators and policymakers to develop effective interventions that simultaneously enhance nurse productivity and promote a positive patient safety culture.

### What is known about the topic

- Intensive and critical care nurses (ICCNs) play a critical role in ensuring patient safety, and their work productivity is essential for optimal patient outcomes.
- High levels of work stress and demanding work environments in intensive care units can negatively impact nurses' productivity and patient safety attitudes.

### What this paper adds

- This study reveals a strong positive relationship between work productivity and patient safety attitudes among ICCNs.
- The study's structural equation modelling analysis identifies teamwork climate, perceptions of management, job satisfaction and stress recognition as significant predictors of nurse productivity, demonstrating how these factors interact to influence work productivity in intensive care settings.
- The findings highlight the need for health care institutions to implement strategies that enhance these factors to improve both nurse productivity and patient safety outcomes.

## 2 | AIM OF THE STUDY

The present study aimed to determine the relationship between work productivity and patient safety attitudes among ICCNs and reveal the underlying factors influencing this relationship using structural equation modelling (SEM).

## 3 | METHODS

### 3.1 | Study design

This study was a cross-sectional design implemented through a web-based survey. The Checklist for Reporting Results of Internet E-Surveys (CHERRIES) was utilized to guide reporting in this study (see [Supplementary File 1](#)).

### 3.2 | Sample, setting and recruitment

An online survey invited nurses who were registered members of the Turkish Society of Critical Care Nurses, of which the principal investigator was a member, to participate in the study. Following ethical approval, the researcher contacted the relevant association and requested that they disseminate the electronic survey link via email to their members and share it on the association's social media account.

Prior to the commencement of data collection for the study, it was ascertained that there were 1600 registered members of the association from diverse geographical regions within Türkiye. A convenience sampling method was employed to ensure the inclusion of a maximum number of nurses. The inclusion criteria were as follows: (a) volunteering to complete the online data collection form; and (b) having worked in the ICU of any hospital for a minimum of 1 year.

As the percentage of participation could not be estimated at the outset of the study, the post hoc sample size was calculated using G\*Power 3.1.9.7 software following the completion of the data collection process. A total of 372 ICCNs participated in the study. The post hoc power analysis revealed that the study was powered at 99% with a two-sided  $\alpha$  of 5%, an effect size of .30 and a sample size of 372.

### 3.3 | Data collection procedures and instruments

After obtaining ethical approval for the study, the data collection instruments were transferred to the Google Forms online survey platform, which was designed to avoid duplicate responses. The survey link was shared with the relevant association, and nurses were invited to participate in the study via email. The principal investigator did not engage in direct communication with the ICCNs and ensured compliance with data confidentiality laws. In the first section of the online data collection instrument, participants were presented with a consent page that included a description of the purpose and importance of the study, the inclusion criteria, the names of the questionnaires, the estimated completion time, the principles governing the storage of data, information regarding confidentiality and the contact information of the principal investigator. Furthermore, the participants were informed that they could withdraw from the study at any time. Those who responded in the affirmative to the enquiry, 'Do you voluntarily agree to participate in this study?' in this section were directed to the data collection instruments on the next page; those who responded in the negative were prevented from accessing the subsequent page. In order to ensure that respondents answer all questions completely: the 'mandatory' tab is enabled for each question on the Google Form survey; thus, there were no missing quantitative data. The response period was 28 days (12 August 2024–09 September 2024). Only those nurses who completed the survey were included in the analysis sample. No supplementary strategies, such as financial incentives, sweepstakes, prizes or postcard reminders, were employed to facilitate survey completion. The Google Form timer indicated that the questionnaire required a minimum of 10 min and a maximum of 17 min to complete.

The following instruments were used to collect data: (a) the Nurse Information Form (NIF), (b) the Attitudes Toward Productivity Scale (ATPS) and (c) the Patient Safety Attitude Questionnaire (PSAQ).

#### 3.3.1 | Nurse Information Form

This form was designed to facilitate the collection of data pertaining to the socio-demographic characteristics of ICCNs (e.g., age, gender, education, work experience, etc.) and the ICU in which they are employed (e.g., type of ICU ward, nurse: patient ratio, working hours per week, etc.).

#### 3.3.2 | Attitudes Toward Productivity Scale

This scale was developed by Göktepe and Baykal (2010) to determine nurses' attitudes towards work productivity.<sup>22</sup> The ATPS, which consists of 39 questions in total, consists of five sub-dimensions: 'Dedication to Job (eight items), Working Conditions (eleven items), Demands of Job (eight items), Teamwork (eight items) and Awarding (four items)'. Each item is scored on a five-point Likert scale (between Strongly Disagree [1 point] and Strongly Agree [5 points]), and negative items are scored in reverse. The score range of the scale varies between 39 and 195, with an increase in score indicating a positive attitude towards work productivity. The Cronbach's alpha reliability coefficient for ATPS was reported as .88,<sup>22</sup> and in this study, it was determined as .90.

#### 3.3.3 | Patient Safety Attitude Questionnaire

This scale, developed by Sexton et al. (2006) and adapted into Turkish by Kaya et al. (2010), was used to assess patient safety culture and climate.<sup>23,24</sup> The Turkish version of the PSAQ consists of 30 items and 6 sub-dimensions: Teamwork Climate (six items), Safety Climate (seven items), Perceptions of Management (four items), Job Satisfaction (five items), Working Conditions (four items) and Stress Recognition (four items). The items of the scale are scored on a 5-point Likert scale ranging from 'Strongly Disagree (1 point)' to 'Strongly Agree (5 points)'. The range of possible scores is from 30 to 150. Some negative items are reverse scored. Higher scores indicate more positive patient safety attitudes. The study reported a Cronbach's alpha reliability coefficient for PSAQ of .89.<sup>24</sup> This study found it to be .88.

### 3.4 | Data analysis

The study data were analysed by SPSS (Statistical Package for Social Sciences, version 29.0) and AMOS (Analysis of Moment Structures, version 29) software packages for Windows. The data were tested for normality using skewness/kurtosis values and the Shapiro–Wilk test. The results of the socio-demographic and other characteristics of the

participants were summarized with descriptive statistics (mean, standard deviation, percentage and frequency). Pearson correlation analysis was used to examine the relationship between work productivity and patient safety attitudes. The strength of the correlation was determined based on the coefficient, with values ranging from 0.20 to 0.40 indicating a low correlation, 0.40 to 0.70 indicating a moderate correlation, 0.70 to 0.90 indicating a high correlation, and 0.90 to 1.00 indicating a very strong correlation. The SEM, using maximum likelihood estimation, was then conducted to test the theoretical model. The independent variables were team-work climate, safety climate, perceptions of management, job satisfaction, working conditions and stress recognition, whereas the dependent variable was attitudes towards productivity in the hypothesized model. The fit parameters of the hypothesized model were evaluated using the following indices: chi-square ( $\chi^2$ )/degree of freedom (df) (<5), goodness-of-fit index (GFI) (>0.85), comparative fit index (CFI) (>0.90) and root mean square error of approximation (RMSEA) (<0.08). The level of statistical significance was set at  $p < .05$ .

### 3.5 | Ethical considerations

Bursa Uludag University Health Sciences Research and Publication Ethics Committee (Decision No. 2024-03/05, Date: 27.03.2024) granted approval for the study's conduct. The first section of the web-based survey tool explicitly states that participants may terminate their participation at any point and that it is free of charge, along with the study's purpose and specifics. The study deemed ICCNs who responded affirmatively to the inquiry about voluntary participation to have given their consent. Each participant completed the questionnaire anonymously, and no questions included any personal information, such as name, address, e-mail address or phone number. The Google Form settings were configured to allow for anonymous responses, thereby preventing the recording of participants' IP addresses, location data and contact information during the data collection process. The data were stored in a password-protected file on a password-protected computer, accessible only by the principal investigator.

## 4 | RESULTS

### 4.1 | Characteristics of the nurses

The mean age of the 372 ICCNs who participated in the study was  $29.50 \pm 5.59$  years (Table 1). Of these participants, 85.2% were female and 72.3% had obtained a bachelor's degree. The majority of the nurses (43.3%) reported working in a university hospital, in general or anaesthesiology ICUs (29.3% and 23.1%, respectively), for a mean of  $4.98 \pm 4.07$  years. The data indicated that nearly half of the nurses (47.3%) reported providing care at a nurse-to-patient ratio of 1:2, while 55.6% of them reported working more than 48 h per week.

**TABLE 1** Socio-demographical and ICU-related information of ICCNs ( $n = 372$ ).

Characteristics	$n$ (%) or $M \pm SD$
Age (years)	$29.50 \pm 5.59$
Gender	
Female	317 (85.2)
Male	55 (14.8)
Education	
Associate degree	65 (17.5)
Bachelor's degree	269 (72.3)
Postgraduate degree	38 (10.2)
Type of hospital	
University	161 (43.3)
Public	100 (26.9)
City	77 (20.7)
Private	34 (9.1)
Type of ICU ward	
Anaesthesiology and re-animation	86 (23.1)
General	109 (29.3)
Medical	33 (8.9)
General surgery	14 (3.8)
Cardiovascular/cardiology	52 (14.0)
Paediatric/newborn	56 (15.1)
Others <sup>a</sup>	22 (5.9)
Work experience in ICU (years)	$4.98 \pm 4.07$
Work experience (categorical)	
1–5 years	267 (71.8)
>5 years	105 (28.2)
Nurse:patient ratio	
1:2	178 (47.8)
1:3	114 (30.6)
$\geq 1:4$	80 (21.5)
Working hours per week	
40–48 h	165 (44.4)
>48 h	207 (55.6)

Abbreviations: M, mean; ICU, intensive care unit; SD, standard deviation.

<sup>a</sup>Neurology, neurosurgery, burn and pulmonology ICUs.

### 4.2 | Work productivity and patient safety attitudes of ICCNs

The total ATPS and PSAQ scores of the nurses were  $97.79 \pm 16.16$  and  $96.47 \pm 17.57$  points, respectively (Table 2). As indicated by the correlation analysis results presented in Table 3, a positive and statistically significant relationship was observed between the total score of the ATPS and the total score and five subscales of the PSAQ (Teamwork Climate, Safety Climate, Perceptions of Management, Job Satisfaction, Working Conditions), with a moderate to high level of correlation. Conversely, a moderately negative and statistically significant relationship was identified between the Stress Recognition

subscale ( $p < .01$ ). Similarly, there were significant correlations between the ATPS subscales and the total PSAQ score, along with its subscales, at low to moderate levels ( $p < .01$ ).

**TABLE 2** Work productivity and patient safety attitudes of ICCNs ( $n = 372$ ).

Scales	Range of scores	M $\pm$ SD
Work productivity		
Dedication to job	8–40	30.96 $\pm$ 4.74
Working conditions	11–55	18.99 $\pm$ 5.15
Demands of job	8–40	16.80 $\pm$ 4.52
Teamwork	8–40	24.07 $\pm$ 5.68
Awarding	4–20	6.94 $\pm$ 2.38
Total score	39–195	97.79 $\pm$ 16.16
Patient safety attitudes		
Teamwork climate	6–30	21.58 $\pm$ 4.39
Safety climate	7–35	22.21 $\pm$ 5.21
Perceptions of management	4–20	10.25 $\pm$ 3.80
Job satisfaction	5–25	15.20 $\pm$ 5.47
Working conditions	4–20	10.87 $\pm$ 3.78
Stress recognition	4–20	16.33 $\pm$ 3.47
Total score	30–150	96.47 $\pm$ 17.57

Abbreviations: M, mean; SD, standard deviation.

**TABLE 3** Pearson correlation coefficients between ICCNs' work productivity and patient safety attitudes ( $n = 372$ ).

Variable	PSAQ score						
	Total	TC	SC	PM	JS	WC	SR
Total ATPS score	0.704*	0.587*	0.581*	0.509*	0.726*	0.507*	–0.407*
Dedication to job	0.463*	0.416*	0.421*	0.193*	0.518*	0.316*	–0.186*
Working conditions	0.370*	0.274*	0.257*	0.416*	0.447*	0.328*	–0.433*
Demands of job	0.534*	0.456*	0.418*	0.422*	0.596*	0.391*	–0.419*
Teamwork	0.626*	0.583*	0.537*	0.413*	0.540*	0.396*	–0.151*
Awarding	0.551*	0.359*	0.421*	0.488*	0.483*	0.413*	–0.152*

Abbreviations: ATPS, Attitudes Toward Productivity Scale; JS, Job Satisfaction; PM, Perceptions of Management; PSAQ, Patient Safety Attitude Questionnaire; SC, Safety Climate; SC, Stress Recognition; TC, Teamwork Climate; WC, Working Conditions.

\* $p < .01$ .

**TABLE 4** Results of structural equation modelling analysis.

Independent variable	Dependent variable	Standardized $\beta$	95% CI	p-value
ATP	Teamwork Climate	.192	0.373, 0.996	<b>.001</b>
ATP	Safety Climate	.055	–0.115, 0.446	.240
ATP	Perceptions of Management	.141	0.233, 0.932	<b>.001</b>
ATP	Job Satisfaction	.482	1.136, 1.625	<b>.001</b>
ATP	Working Conditions	.042	–0.199, 0.550	.353
ATP	Stress Recognition	–.219	–1.281, –0.695	<b>.001</b>

Note: The bold p-values indicate a statistical significance of less than .05. Model fit:  $\chi^2/df = 3.566$ ; GFI = 0.989; CFI = 0.991; RMSEA = 0.078.  $R^2 = .622$ .

Abbreviations: ATP, attitudes toward productivity; CI, confidence interval.

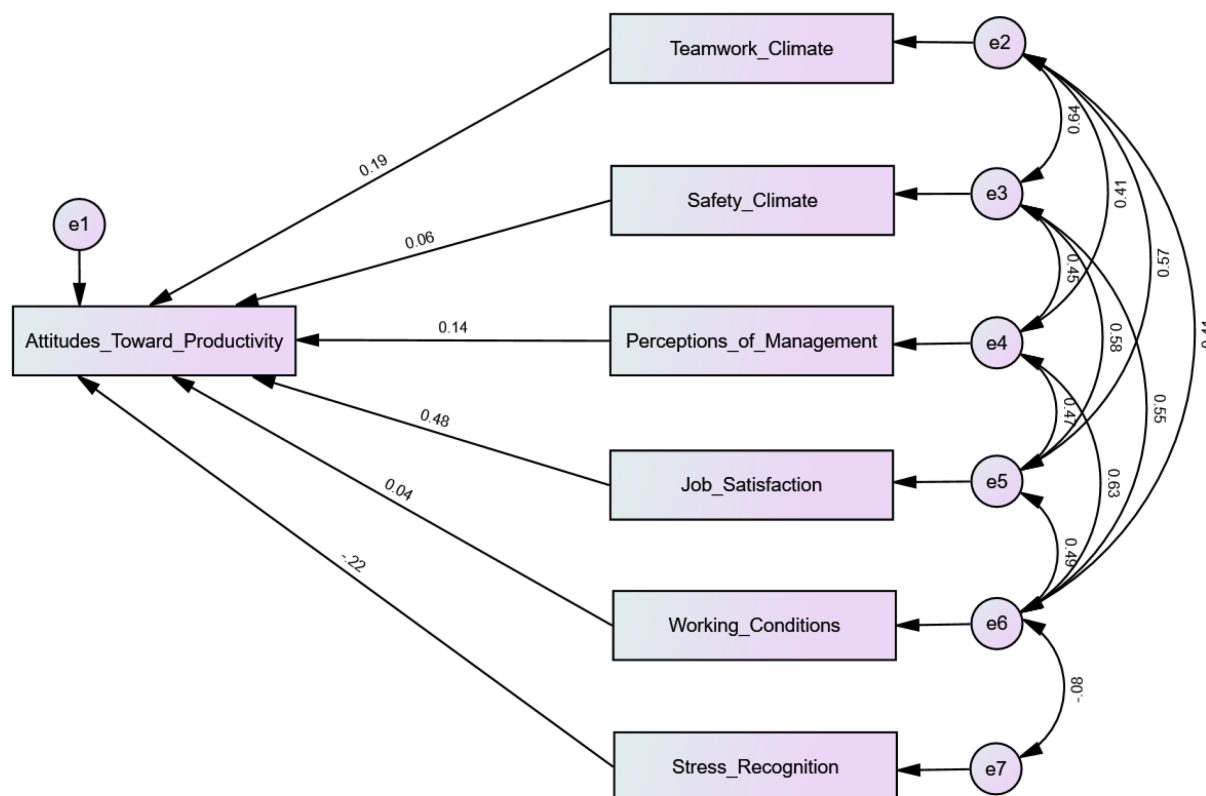
### 4.3 | Structural equation modelling

The present study employed SEM to ascertain the influence of various factors, including Teamwork Climate, Safety Climate, Perceptions of Management, Job Satisfaction, Working Conditions and Stress Recognition, on ATP (Table 4). The model was performed using the maximum likelihood estimation method and showed good fit index results:  $\chi^2/df = 3.566$ ; GFI = 0.989; CFI = 0.991; RMSEA = 0.078.

The model is depicted in Figure 1. Path analysis showed that Teamwork Climate ( $\beta = .192$ ,  $p = .001$ ), Management Perception ( $\beta = .141$ ,  $p = .001$ ) and Job Satisfaction ( $\beta = .482$ ,  $p = .001$ ) positively predicted ATP, whereas Stress Recognition negatively predicted ATP ( $\beta = -.219$ ,  $p = .001$ ). In contrast, findings indicated that Safety Climate and Working Conditions did not predict ATP ( $p > .05$ ). These results revealed that the independent variables explained 62.2% of the total variance in ATP ( $R^2 = .622$ ).

## 5 | DISCUSSION

This study provides critical insights into the relationship between work productivity and patient safety attitudes among ICCNs. A robust SEM approach was employed to elucidate key predictors of ICCNs' ATP, highlighting areas that must be addressed by health care administrators and policymakers to optimize both nurse performance and



**FIGURE 1** The path diagram of the model.

patient care outcomes. The SEM results revealed that teamwork climate, perceptions of management and job satisfaction significantly and positively predict ICCNs' ATP, while stress recognition has a significant negative effect.

This study revealed a strong positive correlation between the total ATPS score and the total PSAQ score, indicating that ICCNs who hold positive ATP also tend to have favourable patient safety attitudes. This underscores the symbiotic relationship between productivity and safety perceptions, suggesting that improvements in one area could positively influence the other. This aligns with previous research indicating that supportive work environments contribute to enhanced staff performance and better patient outcomes.<sup>10,14,25</sup>

The positive influence of teamwork climate on ATP underscores the critical role of effective teamwork in enhancing ICCNs' productivity attitudes. This finding is supported by the correlation analysis, where the total ATPS score showed a moderate positive correlation with the PSAQ subscale Teamwork Climate. Additionally, the ATPS subscale 'Teamwork' had significant correlations with both Teamwork Climate and Safety Climate of the PSAQ. These correlations reinforce the SEM findings, suggesting that ICCNs who perceive a positive teamwork environment are more likely to exhibit favourable productivity attitudes. Effective teamwork fosters better communication, collaboration and support among staff, which can enhance efficiency, job performance and quality of patient care.<sup>26-29</sup>

The SEM model revealed that perceptions of management also positively predicted ATP. This suggests that positive perceptions of

management are associated with higher levels of productivity attitudes among ICCNs. The correlation results corroborate this assertion, demonstrating a statistically significant positive correlation between the total ATPS score and the PSAQ subscale Perceptions of Management. Furthermore, the ATPS subscales 'Awarding', 'Demands of Job', 'Teamwork' and 'Working Conditions' demonstrated a moderately positive correlation with Perceptions of Management. These findings indicate that ICCNs who perceive reasonable job demands, experience effective teamwork and are satisfied with their working conditions tend to have more favourable perceptions of management. The literature supports these findings, which show that effective management practices that ensure manageable workloads, foster teamwork and improve the working environment enhance work engagement and productivity.<sup>6,30,31</sup> These findings suggest that management practices impacting these areas play a crucial role in shaping ICCNs' productivity attitudes, emphasizing the need for comprehensive management strategies that address various facets of the work environment to enhance both perceptions of management and productivity. It is important to consider that strategies designed to improve the working environment and conditions have the potential to enhance nurses' well-being, facilitate retention and enable them to deliver higher standards of patient care.<sup>32,33</sup>

The results of the SEM indicated that 'Job Satisfaction' was the strongest positive predictor of ATP. The correlation analysis also supported this finding. Additionally, the ATPS subscale 'Dedication to Job' demonstrated a significant correlation with job satisfaction.



These findings indicate that ICCNs who are satisfied with their jobs exhibit greater dedication and more positive attitudes towards productivity. Factors that contribute to job satisfaction include the perception of meaningful work, being part of a solid team, access to professional development opportunities and a supportive work environment.<sup>34,35</sup> It is therefore important to enhance job satisfaction in order to improve the productivity of ICCNs. A systematic review and meta-analysis revealed that effective interventions for enhancing nurses' job satisfaction include workshops, educational sessions, mentoring programmes, interpersonal interaction improvement programs and evidence-based nursing management practices.<sup>36</sup>

In contrast, the SEM model revealed that 'Stress Recognition' had a negative predictive effect on ATP, indicating that heightened awareness of stress is associated with diminished productivity attitudes. Therefore, it is noteworthy that the ATPS subscales 'Working Conditions' and 'Demands of Job' exhibited a significant negative correlation with stress recognition. This may be attributed to the inherently stressful nature of working in the ICU, which is characterized by the critical condition of patients, the necessity for constant vigilance, the complexity of care and the presence of various environmental factors.<sup>37,38</sup> Moreover, the challenging working conditions that are prevalent in developing countries, including Türkiye, such as inadequate staffing, inadequate resources, lengthy work hours and elevated nurse-to-patient ratios, intensify this stress, creating a situation in which ICCNs feel overwhelmed by the demands of their work.<sup>39,40</sup> These situations suggest that elevated levels of stress, potentially attributable to suboptimal working conditions, are associated with a decline in ICCNs' ATP. Excessive stress can impair cognitive functioning, diminish job satisfaction and precipitate burn-out.<sup>12,41,42</sup> This highlights the imperative for interventions that prioritize enhancing working conditions, effectively managing job demands, and furnishing robust stress management resources to bolster ICCNs' well-being and enhance their productivity attitudes. Health care institutions can facilitate the mitigation of occupational stress among ICCNs via the implementation of interventions at the individual (e.g., cognitive-behavioural and mindfulness-based interventions) and organizational levels (e.g., modifications to working conditions, provision of organizational support and alteration of work schedules).<sup>43</sup> However, 'Safety Climate' and 'Working Conditions' did not significantly predict ATP in the SEM model, despite moderate positive correlations observed in the correlation analysis. One possible explanation is that nurses might have perceived the safety environment and working conditions as essential elements of their job that, while critical for patient care, do not directly affect their personal productivity attitudes. In ICUs, where high safety standards and specific working conditions are expected, these factors may be regarded as baseline requirements rather than motivators for increased productivity. Additionally, cultural factors specific to Türkiye and similar contexts might play a role. In environments where resource constraints are common, ICCNs may have adapted to less-than-ideal working conditions and safety climates, focusing instead on factors they perceive they can influence more directly, such as teamwork and management relationships. This adaptation

could diminish the perceived impact of safety climate and working conditions on their productivity attitudes.

## 5.1 | Limitations

This study has some limitations. The study was conducted at a specific time with Turkish intensive care nurses who volunteered to participate through the association, and the response rate was low (23.2%, 372/1600). As a result, the findings cannot be generalized. The low response rate may be attributed to the online survey data collection method, which included the inability to reach potential respondents individually, respondents' lack of attention to posts on the association's email or other communication groups, survey fatigue, and time constraints. The use of self-report questionnaires in this study may increase the risk of bias. Social desirability may have resulted in nurses responding positively to some attitude items. Finally, the absence of a longitudinal design precluded a thorough examination of the relationship between ATP and patient safety attitudes.

## 5.2 | Implications and recommendations for practice

This study highlights the importance of fostering a positive work environment to enhance productivity and patient safety attitudes among ICCNs. Health care organizations should implement strategies that promote teamwork, effective management, job satisfaction and stress reduction to improve nurse performance and patient care outcomes. Future research should explore the impact of targeted interventions on these factors and assess their long-term effects on both nurse productivity and patient safety in different intensive care settings. Additionally, longitudinal studies could provide deeper insights into how changes in work environment dynamics influence patient safety attitudes over time.

## 6 | CONCLUSION

This study sheds light on the critical factors influencing work productivity among ICCNs, emphasizing the impact of teamwork climate, perceptions of management, job satisfaction and stress recognition on productivity attitudes. By focusing on these areas, health care organizations can create a work environment that supports ICCNs' well-being, enhances productivity and ultimately leads to better patient care outcomes. Future research should explore these relationships further, possibly through longitudinal studies or intervention-based research, to establish causality and evaluate the effectiveness of specific management strategies.

## AUTHOR CONTRIBUTIONS

**Öznur Erbay Dallı:** Conceptualization; data curation; formal analysis; investigation; methodology; project administration; supervision;

validation; visualization; roles/writing—original draft; writing—review and editing.

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## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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