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Well-being in intensive care: reflections from a multinational survey

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Abstract

Background Intensive care unit (ICU) professionals face high levels of stress, burnout, and work-related psychological strain. However, comprehensive multinational assessments of their well-being—particularly those exploring gender differences and work-life dynamics—are scarce.

Methods A cross-sectional survey was conducted by the International Women in Intensive and Critical Care Network (iWIN) between October 2023 and June 2024. The 113-item questionnaire assessed well-being using the WHO-5 Well-Being Index and other validated instruments across eight domains. ICU professionals were recruited via email, professional meetings, and the iWIN website. Descriptive statistics, *T*-tests, chi-square, and Mann–Whitney *U* tests were used for analysis.

Results One hundred fifty-eight ICU professionals from diverse roles responded (62% female, 37% male, 1% other). The median WHO-5 score was 68 (IQR 52–80); males reported significantly higher scores than females (72 vs. 60; $p = 0.0051$). Respondents reported high workload, moderate job autonomy, and frequent stress. Temporary employment was common, with 41.1% considering job transfers. Despite generally positive diversity ratings, gender disparities remained in perceptions of hiring, promotion, and career advancement fairness.

Conclusions This exploratory survey found generally positive well-being among ICU professionals, with a gender difference observed in WHO-5 scores. Concerns related to workload, job insecurity, and career development were also reported. Findings should be interpreted with caution and warrant further investigation.

Keywords Well-being, Anesthesia, Critical care medicine, Intensive care, Gender, Disparities

Background

Critical care teams operate in environments of constant urgency and complexity, often making life-or-death decisions under pressure. Constraints such as the need to clearly communicate with critical care personnel, conduct sophisticated clinical decision-making, and include patients and families in treatment decisions characterize the activity of these teams [1]. High degrees of burnout, post-traumatic stress disorder, and moral distress are often experienced by critical care staff. These psychological burdens can be accompanied by depersonalization, emotional tiredness, and a weakened sense of personal achievement. Additionally, headache, exhaustion, irritability, emotional instability, and compassion fatigue have also been described [2]. Despite growing awareness of burnout, few studies have explored the broader well-being of the multidisciplinary ICU workforce across countries, especially considering the complex interplay between professional roles, job demands, and personal life [3]. Furthermore, international comparisons may reveal systemic factors that either exacerbate or buffer

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well-being, offering valuable insights for more effective interventions. Well-being is impacted by our work and personal environments. Women, in particular, may face additional, often under-recognized challenges that impact their professional fulfillment and mental health [4]. Health professionals need to be well to provide high-quality health care to their patients, to experience critical care medicine as a rewarding and satisfying career and to be truly present for their family and friends [5]. Critical care professionals deserve to have joy in professional and personal lives despite working in a high-intensity workplace [6].

To address this concern, the International Women in Intensive and Critical Care Network (iWIN) conducted a multinational survey to explore how work and personal environments are associated with the well-being of ICU professionals. The primary aim of this survey was to describe the well-being among ICU professionals using the World Health Organization (WHO) scale. Secondary aims were to describe other key factors of well-being at the workplace.

Methods

Study design

Between October 2023 and June 2024, we conducted an exploratory, cross-sectional survey distributed through the iWIN network and related professional meetings. For designing this study, the Consensus-Based Checklist for Reporting of Survey Studies (CROSS) method was followed [7], Supplementary Material (SM) Item S1. The complete survey is presented in SM Items S2.

Eligibility and data collection methods

All healthcare practitioners working in ICU settings were eligible for participation. The questionnaire comprised 113 questions divided into four sections. We explored eight domains, as shown in Fig. 1.

Operational definitions of key study variables and data collection

Well-being and related domains were assessed using validated instruments. The WHO-5 Well-Being Index was used to assess general well-being. Interpretation of the WHO-5 scale [8]: the WHO-5 Well-Being Index ranges from 0 to 25, with higher scores indicating better well-being; scores are commonly expressed as percentages (0–100%), and values ≤ 13 (or ≤ 52%) may indicate clinically relevant depression. Work environment and organizational factors were evaluated using selected subscales of the Work Environment Scale (WES-10) and work autonomy scales. Meaning at work was assessed using the Work and Meaning Inventory (WAMI), while interpersonal dynamics were evaluated using the Work Relationships Scale (WRS, range 15–90). Work–life interaction was measured using the Work–Family Conflict (WFC, range 5–35) and Family–Work Conflict scales. Workload was assessed using the NASA Task Load Index (TLX; range 0–100), and perceived job insecurity was measured using the Job Insecurity Scale (JIS, range 4–20). Higher scores generally indicate greater levels of the construct measured (e.g., higher workload, greater job insecurity), unless otherwise specified. Detailed operational definitions are provided in the SM Item S3. Questions were provided using a Likert scale multiple or single-choice

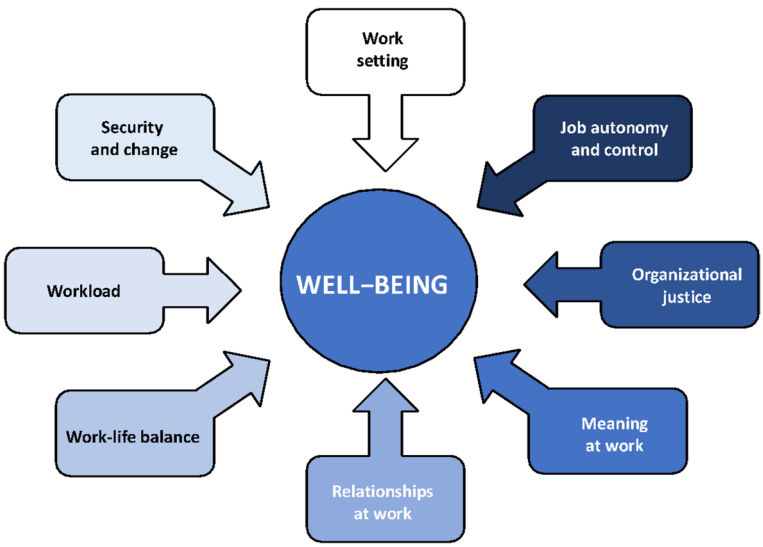

Fig. 1 Eight domains impacting well-being at the workplace according to the Financial services culture board. More information can be found at the following link: https://financialservicesculturebord.org.uk/wp-content/uploads/2019/03/BSB-wellbeing-paper.pdf

questions depending on the nature of the explored domain.

The following data were collected: (1) general information/socio-demographic characterization (country of clinical/research work, nationality, ethnicity, type of hospital (university, non-university, private institution), age, gender, disability (yes/no), profession in ICU (ICU nurse/advanced clinical practitioner, ICU respiratory therapist, fellow/resident/doctoral student, ICU consultant, associate professor, head of department/full professor, other), years of experience in health care); (2) measure of well-being (the WHO-5 scale [8] was used to assess general well-being); (3) factors which influence well-being at work using previously validated questionnaires (work setting/environment, job autonomy and control, organizational justice, meaning at work, relationships at work, work-life balance (family environment, Work–Family Conflict Scale, family work scale), workload (mean hours, subjective work, and mental demand), security and change (intention to leave work, work situation), other general factors (influence of environment)) [9].

Survey administration

Participation was voluntary and anonymous. This targeted outreach aimed to engage participants who are already familiar with the relevant topics and can provide valuable insights. The survey link was emailed to 185 individuals, which comprise participants from the annual meetings organized by the network, individuals with specific interests in equality, diversity, and inclusion, as well as personal contacts established by experts in Intensive Care. The survey was made available also via the network website. Among the 185 individuals directly contacted via email, approximately 85% responded. However, as the survey was also disseminated through open channels (e.g., website and meetings), the overall response rate relative to the target population cannot be determined. The survey was additionally mentioned during three significant events: the iWIN 2023 Annual Meeting in Catania, Italy, the World Day of the Critical Lung 2023 (virtual meeting), the 35th SMART anesthesia and intensive care medicine meeting in Milan, 2024, and the 26th Jornadas Medicina Intensiva held in Porto, Portugal, 2023. At these events, the content and objectives of the survey were explained to attendees, fostering engagement and allowing them to understand its significance. To further enhance participation, the survey was translated into Spanish while presented during the international online meeting World Day of the Critical Lung 2023. This meeting traditionally starts featuring a session dedicated to equality, diversity, and inclusion. During the 2023 session, authors introduced the survey and provided access through a link uploaded to the iWIN website (www.iwinideal.com), allowing interested individuals to participate easily. Overall, these efforts aimed to broaden outreach and ensure diverse participation in our research study. The iWIN survey is longer and more complex compared to most used in the field; therefore, the message related to its importance was reinforced to secure participation and justify the need.

Time frame

The survey was conducted over a designated time frame, with recruitment open for 9 months from October 15th, 2023, to June 15th, 2024. The extended recruitment period was chosen to facilitate broad multinational dissemination through professional networks and meetings, and to maximize participation among ICU professionals, who often have limited availability due to demanding clinical schedules. One written follow-up reminder was sent after 6 months to a list of private email contacts (185 people) to encourage participation and ensure a robust response rate. The link to the survey was freely available on the iWIN website from October 2023.

Prevention of multiple participation

To prevent multiple participation by the same individuals, unique identifiers were employed for the email distribution and on the system. Clear instructions were provided during the presentations to emphasize the importance of unique responses, further supporting the integrity of the data collected. Consent for participation was also requested before starting the survey. Through these methods of administration, we sought to ensure a comprehensive and diverse representation of perspectives in our findings.

Study preparation

Before conducting the survey, a thorough preparation process was undertaken to ensure its effectiveness and clarity. The authors held three preparatory calls leading up to the 2023 iWIN meeting in Italy (www.iwinideal.com), discussing objectives, target audience, and methodology. In June 2023, a hybrid meeting was convened to finalize survey details and involve key experts, which enriched the design process. Following the iWIN meetings, two additional calls addressed emerging questions and implementation strategies. Team members independently tested the survey and provided feedback, identifying ambiguities and allowing for adjustments prior to broader distribution. A special meeting focused on the Spanish translation, where a native speaker translated the survey, followed by a second speaker reviewing for accuracy and clarity. Final proofreading ensured quality. The concluding meeting assessed the study results' relevance. This comprehensive preparation ensured a well-designed

survey equipped to gather meaningful data and achieve its research objectives.

Ethical Considerations

This survey follows the Helsinki Declaration and Good Clinical Practice (GCP) principles [10, 11]. The Institutional Review Board (IRB) "Comissão de Ética para a Investigação em Ciências Sociais e Humanas", Universidade do Minho, Minho, Portugal, approved the study with reference number: CEICSH 055/2023. Informed consent was acquired from each participant before initiation of the questionnaire. Data were collected as anonymized, and only the principal investigator (D.B.) accessed the database.

Statistical analyses

No sample size calculation was performed considering the exploratory and descriptive nature of this survey. Data from the questionnaire were exported as a comma-separated value report from an online software package and subsequently stored as an Excel file (Microsoft Corp®, Redmond, WA). Descriptive statistics were computed for all study variables. The results were presented as numbers and percentages for categorical variables, or medians (interquartile range) where not otherwise reported, as appropriate. Normality of data was tested using the Shapiro–Wilk test. Differences between groups (females vs. males) were assessed using a Mann–Whitney *U* test. $P < 0.05$ was considered statistically significant. Considering the small sample size, we did not perform multivariable modeling or adjust for potential confounders such as country, professional role, or contract type; therefore, observed gender differences should be interpreted as descriptive associations rather than causal inferences. JASP software (version 0.19.3) and the R package were used for the statistical analysis.

Results

Characteristics of the sample

A total of 158 healthcare professionals participated in the survey, with a predominance of female respondents (62%). Most participants were aged between 26 and 35 years (42%). The sample included a range of professional roles, with ICU consultants representing the largest group (30.4%), followed by trainees (20.3%), and other healthcare professionals including nurses and respiratory therapists. Most respondents were working in European countries (61.4%), although a substantial proportion were from extra-European regions (38.6%), supporting the multinational scope of the survey. In terms of ethnicity, over half of participants identified as White/Caucasian (55.1%), with a significant proportion identifying as Hispanic/Latin (38.0%). Most respondents worked in university hospitals (65.2%) and reported substantial clinical workload, with nearly 38% working more than 60 h per week. Sociodemographic and health behavior profile of respondents is reported in Table 1 and SM Item S4.

Measure of well-being according to the WHO-5 Well-Being Index

The overall median WHO-5 Well-Being Index score was 68 (IQR: 52–80), corresponding to 54.2% of the maximum possible score. Males reported a higher well-being than females [72 (IQR: 60–84) vs. 60 (IQR: 47–76), $p = 0.0051$]. Boxplots and frequency distributions for each domain of the WHO well-being scale are shown in Fig. 2.

Other measures of well-being

Overall satisfaction with the work setting was reported by 55% of respondents, with a median score of 32 points (IQR: 28–35). Self-realization was perceived by 50% of participants (median: 15 (IQR: 12–18)), while workload was perceived by 65% (median: 6.5 (IQR: 5.75–8)). Work-related conflicts were reported by 44.4% of respondents [median: 5 (IQR: 3–7)], and nervousness was experienced by 55.6% (median: 6 (IQR: 6–8)). The frequency distribution for each domain is shown in SM Item S5.

Perceived job fit and workload expectations among respondents are reported in Fig. 3A. Median workload, as assessed by the NASA Task Load Index, was 86 (IQR: 69–97.25, range 0 to 100).

Job autonomy was rated with a median score of 44 (IQR: 32–53.25), and its frequency distribution is shown in SM Item S6. Response distributions for the subdomains of organizational justice—distributive and procedural justice—are presented in Fig. 3B.

The median work meaningfulness score was 43.5 (IQR: 35–48; range 10–50). Subdomain medians were positive meaning, 23 (IQR: 18–26); meaning making through work, 16 (IQR: 13–20); and greater good motivation, 5 (IQR: 3–5). The median Work-Related Stress (WRS) score was 39.5 (IQR: 27–52; range 0–80). The median Work–Family Conflict (WFC) score was 35 (IQR: 23–46; range 0–80).

The job insecurity scale had a median score of 8.5 (IQR: 8–12; range 4–20) points. A job transfer was considered by 41.1% of respondents, while 25.3% anticipated retirement. Additionally, 20.3% were contemplating a change in career or specialization, 6.3% expected contract termination, and 5.7% foresaw no changes in their employment status. Figure 4 shows the degree to which various factors were perceived as negative influences in the work environment.

Table 1 Sociodemographic and health behavior profile of respondents

Category	Details	Number (%)
Gender	Male	59 (37.3%)
	Female	98 (62.0%)
	Other	1 (0.6%)
Age	< 25	38 (24.0%)
	26–35	66 (41.8%)
	36–45	51 (32.3%)
	46–65	3 (1.9%)
	> 65	0 (0.0%)
Hospital type	University	103 (65.2%)
	Non-university	32 (20.2%)
	Private institution	23 (14.6%)
Profession	ICU consultant	48 (30.4%)
	Fellow/resident/doctoral student	32 (20.3%)
	Associate professor	11 (7.0%)
	Head of dept./full professor	17 (10.8%)
	ICU respiratory therapist	9 (5.7%)
	ICU nurse/advanced clinical practitioner	14 (8.9%)
	Other	27 (17.1%)
Years experience in healthcare	< 5	20 (12.7%)
	5–9 years	30 (19.0%)
	10–20 years	65 (41.1%)
	> 20 years	43 (27.2%)
Ethnicity	White/Caucasian	87 (55.1%)
	Hispanic/Latin	60 (38.0%)
	Black/Afro-American	4 (2.5%)
	Other	7 (4.4%)
Country of work	European	97 (61.4%)
	Extra-European	61 (38.6%)
Nationality	European	95 (60.1%)
	Extra-European	63 (39.9%)
Working hours per week	41–60 h	75 (47.5%)
	61–70 h	34 (21.5%)
	> 70 h	26 (16.5%)
	< 40 h	22 (13.9%)
	No response	1 (0.6%)
Household composition	Lived with ≥ 3 people incl. children	76 (48.1%)
	Lived with another person	51 (32.3%)
	Lived with partner	25 (15.8%)
	Lived alone	5 (3.2%)
	Preferred not to answer	1 (0.6%)
Children in household	Youngest children under 5 years of age	Majority
Employment type	Temporary position	122 (76.9%)
	Permanent contract	34 (21.8%)
	Voluntary work	2 (1.3%)
Physical activity level	Sedentary	19 (12.2%)
	Minimal movement	48 (30.1%)
	Moderately active	78 (49.4%)
	Highly active	13 (8.3%)

Table 1 (continued)

Category	Details	Number (%)
Weekly physical exercise	None	29 (18.6%)
	One hour	34 (21.8%)
	2–3 h	68 (42.9%)
	> 5 h	27 (16.7%)
Self-rated physical health	Unhealthy	10 (6.4%)
	Almost unhealthy	51 (32.1%)
	Fit and healthy	92 (58.3%)
	Top physical condition	5 (3.2%)

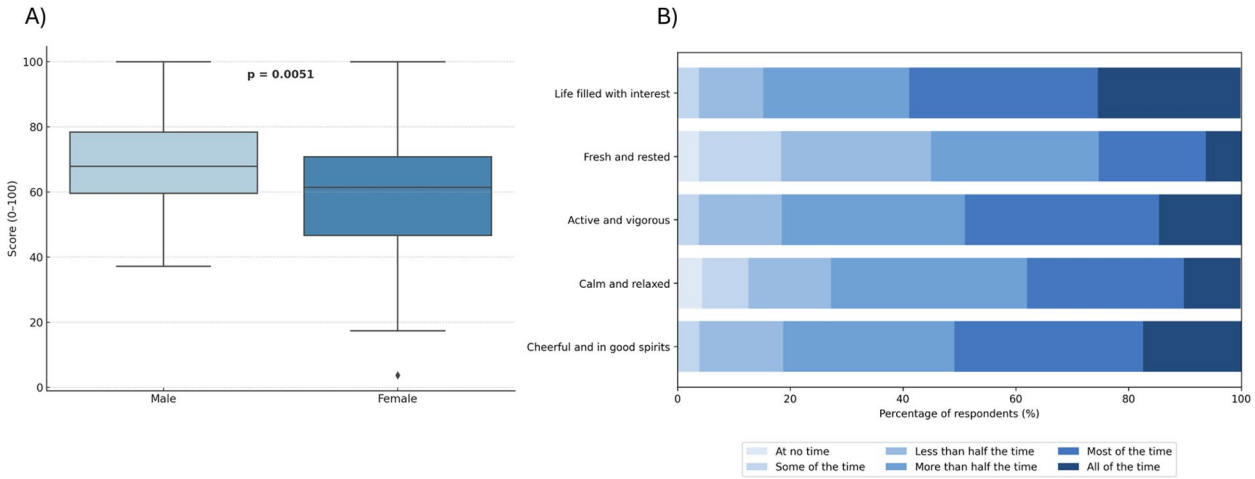

Fig. 2 Frequency distribution for each domain of the WHO well-being scale. **A** Boxplots showing the distribution of WHO-5 scores among male ($n = 59$) and female ($n = 98$) respondents. Males reported significantly higher well-being scores than females (median 72 vs. 60; $p = 0.0051$, Mann–Whitney *U* test). The boxes represent interquartile ranges, with medians marked; whiskers indicate range; and **B** frequency of responses to its subdomains

Fig. 3 Perceived job fit and workload expectations among ICU professionals and organizational justice: distributive and procedural justice. **A** *Perceived job fit and workload expectations among ICU professionals.* This panel displays respondents' perceptions regarding their alignment with job demands and their subjective workload expectations. Responses were distributed across a spectrum of perceived overwork, underwork, or fit between personal skills and job requirements, highlighting variation in workload strain within the ICU workforce. **B** This panel presents response distributions for two subdomains of organizational justice among ICU professionals. Distributive justice refers to the perceived fairness of outcomes (e.g., pay, recognition), while procedural justice reflects the perceived fairness of processes used to determine those outcomes. The panel illustrates considerable variability in how professionals view institutional fairness in the ICU setting

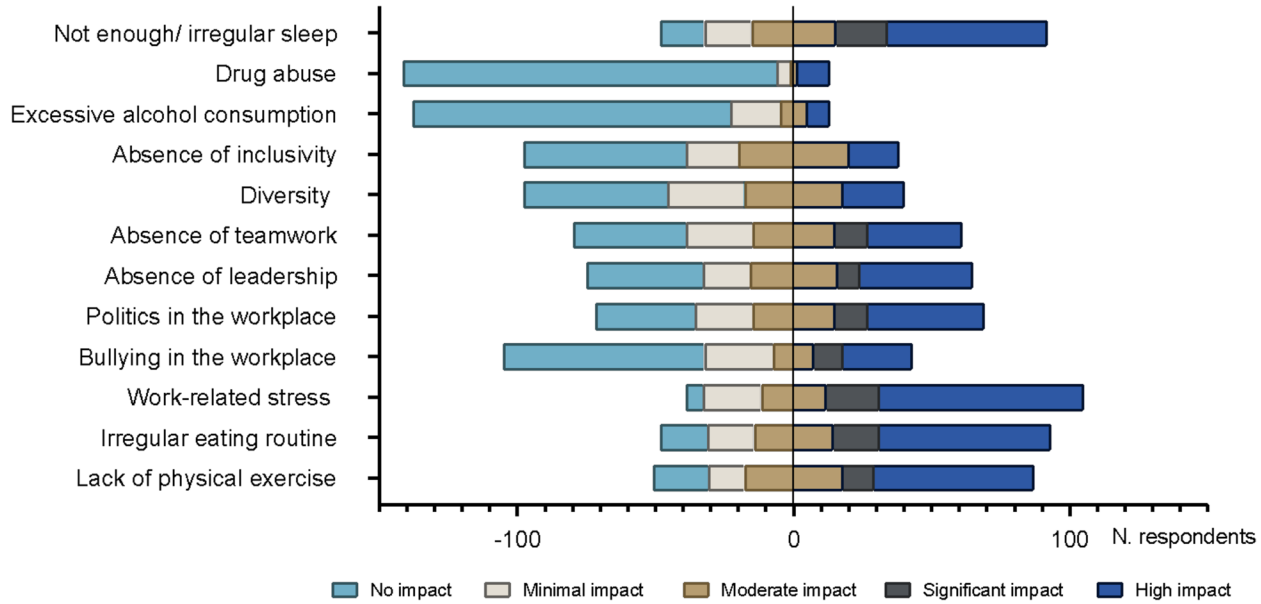

Fig. 4 Perceived negative influences in the ICU work environment. This figure illustrates the proportion of ICU professionals identifying various factors as negative influences on their well-being, including both workplace-related and individual (personal) factors

Overall, 64.7% of participants strongly disagreed that they were excluded from workplace activities due to their gender, while 14.1% strongly agreed. Regarding sex-based stereotypes, 46.8% strongly disagreed and 16.5% strongly agreed that these had affected their experience. Additionally, 48.7% strongly disagreed that their gender was a limitation in the workplace. Views on institutional fairness and diversity management were more mixed. For instance, only 23.4% strongly agreed that managers promoted objectively regardless of race, sex, or age, while 55.1% strongly disagreed with the statement that they had been treated differently based on personal characteristics; see Table 2.

Discussion

The main finding of our multinational survey is that overall well-being, as measured by the WHO-5 index, was generally positive, although males reported higher scores than females. Further, our survey revealed mixed perceptions of job autonomy, meaningfulness, organizational justice, workload, and diversity, highlighting key areas for intervention to improve the ICU work environment.

Table 2 Domains highlighting diversity in the workplace

Domain	Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
I feel that I have been treated differently here because of my race, sex, religion, or age	55.1%	9.5%	10.1%	8.9%	6.3%	8.9%
My managers have a track record of hiring and promoting physicians objectively regardless of their race, sex, religion or age	25.9%	9.5%	13.9%	8.9%	17.1%	23.4%
My managers here give feedback and evaluate physicians fairly, regardless of such factors as the faculty member's race, sex, age, or social background	20.3%	7.6%	20.9%	12%	16.5%	21.5%
My managers here make promotion and tenure decisions fairly, regardless of such factors as the physician's race, sex, age, or social background	18.4%	11.4%	23.4%	12.7%	12.7%	20.3%
My managers interpret human resource policies (such as sabbaticals) fairly for all physicians	20.9%	13.9%	19.6%	13.9%	10.1%	20.3%
My managers give assignments based on the skills and abilities of physicians	15.8%	10.1%	23.4%	19%	13.3%	17.1%

The strength of this study lies in its multinational sample, including participants from multiple countries and professional roles representing various professions and backgrounds. This diversity enhances the generalizability of the findings, allowing for a nuanced understanding of ICU work environments. The survey's comprehensive descriptive design, covering well-being, job satisfaction, workload, autonomy, and diversity perceptions, enables a general view of workplace dynamics.

Males reported higher WHO-5 well-being scores than females. However, given the modest sample size and the absence of multivariable adjustment, this finding represents an unadjusted association and does not allow conclusions regarding causality or underlying determinants [12]. This disparity could be influenced by various domains. Future research should systematically measure these variables to gauge performance indicators and quality control [13].

The predominance of female respondents may reflect broader trends in ICU staffing in some regions; however, it likely also mirrors the composition of the professional network through which the survey was distributed [4]. The majority were aged 26–35, a younger demographic that may shape perspectives on autonomy and job satisfaction. Physical inactivity levels were also notable, with only a minority reporting high activity levels—which could further impact their overall health in a demanding ICU environment. Job security emerged as a relevant concern (job insecurity score of 8.5), with a high proportion of respondents reporting temporary contracts. However, this finding should be interpreted with caution. The prevalence of temporary positions may partly reflect the inclusion of early-career professionals, such as residents or fellows, for whom fixed-term contracts are standard during training in many countries. Moreover, the implications of temporary employment may vary substantially across healthcare systems, where such contracts do not necessarily translate into long-term job insecurity. Therefore, perceptions of job insecurity in our cohort may be influenced by career stage and local workforce dynamics, limiting the generalizability of this observation. In any case, the shared concerns about employment stability emphasize the importance of addressing job security to retain talent and maintain morale within the healthcare workforce [14]. A recent survey from the ESICM revealed that 72% of physicians are female and most nurses and physicians are young [15]. A notable percentage of clinicians left a previous job because of disagreements related to patient care, especially nurses who reported past effective job leave. Almost one-third of the respondents had thoughts about leaving their current job, and perceived inappropriateness of care was independently associated with higher intention to leave a job [15]. The quality of relationships with colleagues and supervisors also impacts feelings of connectedness, while perceived job security may differ by gender, with males feeling more secure in their roles [16]. This disparity in perceived control over work responsibilities may contribute to the differences in self-realization and overall job satisfaction, as autonomy is closely linked to motivation and engagement in one's role.

Autonomy, job meaningfulness, and organizational justice showed room for improvement. Perceptions of meaningful work varied, pointing to potential gaps in mentorship, recognition, or professional growth opportunities. Many respondents agreed that managers do not always hire and promote physicians objectively, suggesting an area needing attention to enhance equity and transparency. While many respondents perceived fairness in hiring and evaluation, concerns about transparency in promotion practices were evident. These differences may result from disparities in access to career advancement, mentorship, and professional development, affecting how meaningful individuals find their work [17]. This may be due to males occupying roles traditionally viewed as impactful or authoritative. Organizational culture might also favor behaviors associated with male employees, leading to a perception that their contributions are more valued. Additionally, societal norms regarding gender roles can influence work perceptions. Feedback and recognition from peers can affect perceived meaningfulness. Females often face greater challenges in balancing work and family, potentially lowering their engagement and perceived significance [18]. To reduce the gender gap in medicine, a comprehensive approach is needed, as detailed in a review with 47 recommendations across seven themes [18]. Key strategies include addressing structural barriers to women's career advancement, improving access to senior positions, and increasing transparency around pay disparities. Policy changes should enforce equitable pay practices, while fostering a culture of inclusivity is essential. Additionally, reviewing performance payment criteria can help avoid disadvantaging women, and ongoing analysis of gender pay gaps is crucial for tracking progress. Together, these strategies can drive significant improvements in gender equity within the medical field [19, 20].

Work-life balance remains a concern, especially for those in complex household situations. The exploration of work-life balance revealed that a substantial portion of respondents live with multiple household members, which may influence their perceptions of work-life integration. Evidence indicates that work environments with higher WRS prioritize key characteristics

such as rich communication, heedful interrelating, trust, respectful interaction, and mindfulness [21]. These elements foster a collaborative and supportive environment essential for effective teamwork and patient care. Conversely, low-scoring clinics lack these traits, which can lead to misunderstandings and lower satisfaction [21]. Interestingly, the WFC score suggests that other non-work factors may influence workplace satisfaction and engagement, but unfortunately, we were unable to explore them [22].

Workload and job strain emerged as important issues. Most respondents reported working long hours, with many exceeding 60 h per week. The high NASA TLX scores confirmed a perception of intense workload and the need for management strategies [23]. Despite this, a significant proportion disagreed with statements suggesting they worked more than required, reflecting a culture where overwork may be normalized. This reflects previous findings showing that over 70% of ICU workers reported perceived conflicts, mostly perceived as severe and significantly associated with job strain [24]. This is particularly relevant given that previous studies with smaller sample sizes indicated significant burnout and well-being challenges among ICU workers [25]. High perceived workloads and frequent reports of inter-staff conflict are consistent with earlier research suggesting that ICU staff often operate under significant stress. Previous literature suggests that anxiety symptoms are closely associated with diminished well-being among healthcare professionals. Many front-line workers (70.8% doctors, 26.2% nurses from 75 countries) reported heightened anxiety when they felt unprotected during the COVID-19 pandemic. Several factors significantly contribute to increased anxiety, including being female, working as a nurse directly within the pandemic, and being younger [26].

Lastly, the exploration of diversity in the workplace indicates that most respondents do not feel excluded or discriminated against based on personal characteristics, like gender, race, or age, as previously reported by the literature [27–29]. Notably, in our survey, 4.5% of participants reported a disability, underscoring the importance of inclusive practices. Despite a majority feeling treated fairly regarding diversity, some respondents noted experiences of stereotypes and differential treatment, emphasizing the need for ongoing efforts to enhance equity and inclusivity in the workplace [30]. This highlights the need for continued attention to diversity and inclusion in healthcare settings. A workplace culture that fosters mentoring and sponsoring younger colleagues to favor their career advancements [19, 20].

Limitations

This study has important limitations. The reliance on self-reported data may introduce bias, as respondents might provide socially desirable answers rather than their true feelings. Additionally, the cross-sectional design captures data at a single point in time, limiting the ability to assess changes in perceptions or experiences over time. The geographic scope may not fully represent all regions, affecting the generalizability of the findings. The sample was not geographically representative of the global ICU workforce, with a predominance of respondents from specific European countries and limited participation from other regions. This unbalanced distribution introduces a substantial risk of selection bias and limits the generalizability of the findings. In particular, the underrepresentation of regions such as Asia and Africa, as well as the predominance of respondents identifying as White/Caucasian or Latin, restricts the ability to draw robust conclusions regarding diversity, equity, and experiences of discrimination across different populations. Future iterations should aim to expand participation across a more diverse and geographically representative cohort to enhance external validity and inclusiveness. Therefore, findings related to fairness, inclusion, and gender or demographic disparities should be interpreted with caution. Furthermore, the presence of non-response bias and potential overlap in roles among respondents could complicate the interpretation of specific results. The fact that part of the sample is from the iWIN network may also mean that the responses can be somewhat biased by the level of awareness of professionals in this group. It represents a convenience sample drawn largely from a professional network with a particular interest in equity and inclusion, introducing substantial risk of selection bias. The predominance of female respondents likely reflects the network composition rather than the broader ICU workforce. In addition, the observed gender differences are based on unadjusted analyses and may be influenced by confounding factors such as country, professional role, employment status, and institutional context; therefore, these findings should be interpreted as descriptive associations rather than causal relationships. Indeed, although several potentially relevant subgroups were represented in the sample, including participants with disabilities and different professional roles, the study was not powered to support robust subgroup analyses. As such, we did not explore differences across these groups to avoid overinterpretation of small sample comparisons. Nevertheless, this preliminary phase allowed us to ascertain that the survey yields valuable information, can be feasibly adapted across different languages, and has the potential to serve as a standardized tool within the

network to benchmark and compare different hospitals and ICU settings. Future studies with larger and more representative samples should therefore not only address these limitations but also leverage this instrument to explore how factors such as disability status, professional role, and other demographic characteristics influence well-being and perceptions of fairness in ICU settings. Recruitment was not population-based, and the survey was not validated as a composite instrument in this setting. We did not perform multivariable modeling or adjust for potential confounders such as country, professional role, employment status, or institutional context. The sample size limits subgroup analyses, and findings should be interpreted as exploratory and hypothesis-generating rather than definitive.

Conclusions

This multinational survey highlights important aspects of well-being among ICU professionals, including gender differences in well-being as measured by the WHO-5 index, alongside broader concerns related to job insecurity, workload, and work-life balance. The widespread prevalence of temporary contracts and long working hours reflects systemic issues in the healthcare workforce, contributing to reduced job satisfaction and elevated stress. These findings suggest areas that may merit further structured investigation, including career development programs, enhanced contract security, and initiatives promoting work-life balance. Addressing these concerns is essential not only for staff well-being but also for the quality and safety of patient care.

Abbreviations

ICU	Intensive care unit
WHO-5	World Health Organization Well-Being Index
WES	Work Environment Scale
WAMI	Work and Meaning Inventory
WRS	Work Relationships Scale
WFC	Work–Family Conflict
TLX	Task Load Index
JIS	Job Insecurity Scale

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s44158-026-00401-y.

Supplementary Material 1. SM Item S1. Checklist for Reporting Of Survey Studies (CROSS). SM Item S2. Survey domains. SM Item S3. Operational definitions of key study variables. SM Item S4. Nationality and Country of respondents. SM Item S5. Frequency distribution for work setting/environment domain. SM Item S6. Frequency distribution for Job autonomy and control domain

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Use of artificial intelligence

AI tools were used solely for grammar and language editing. The authors take full responsibility for the content of the manuscript.

Clinical trial registration

Not applicable. This study was an observational cross-sectional survey and did not involve a clinical trial.

Authors' contributions

DB conceptualized the study, coordinated the project, performed statistical analysis, and drafted the initial manuscript. DB, IA, AV, SDR, JCVS, SPG, BF, ISS, CB, MCMD, LM, OH, and FR contributed substantially to study conception and design, interpretation of results, and critical revision of the manuscript for important intellectual content. FR and DB supervised the study. All authors reviewed, edited, and approved the final manuscript.

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None.

Data availability

No datasets were generated or analysed during the current study.

Declarations

Ethics approval and consent to participate

The study was conducted in accordance with the Declaration of Helsinki and Good Clinical Practice principles. Ethical approval was obtained from the Comissão de Ética para a Investigação em Ciências Sociais e Humanas (CEICSH), Universidade do Minho, Braga, Portugal (reference number CEICSH 055/2023).

Consent to participate

All participants provided informed consent electronically before initiating the survey.

Competing interests

DB lecturer for ESTOR, not related with this work. The other authors have no conflicts of interest to declare.

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