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Original Article

Gender differences in healthcare providers' perceptions of key care priorities for very old patients in intensive care: A secondary analysis of results from ESICM recommendations for the management of very old patients

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ABSTRACT

Background: Consensus-based recommendations have recently been developed to guide the delivery of quality care for very old patients (age ≥80 years) in the intensive care unit (ICU). The study aim to examine the influence of healthcare provider gender on agreement with consensus-based recommendations for the management of very old patients in ICUs.

Methods: We conducted an analysis of survey responses from an international multiprofessional Delphi consensus on management of very old patients in ICUs by the European Society of Intensive Care Medicine. The primary analysis compared mean agreement scores between female and male participants using independent-samples *t*-tests. Secondary analyses included comparisons of strong agreement proportions and adjusted analyses using two-way analysis of variance and multivariable regression models including provider category and age.

Results: The analysis included 128 participants with available gender and clinical activity data (53 female and 75 male respondents). Female participants reported significantly higher agreement scores for several recommendations involving multidisciplinary input, including medication review, clinical pharmacist involvement, transfer to geriatric wards, dietitian support, and speech and language therapy (mean differences of approximately 7.4–11.0 points on a 0–100 scale, $P < 0.050$). In contrast, male participants reported higher agreement for decisions to limit life-sustaining therapy based on expected functional outcome. Analysis of response proportions showed similar patterns, with females more frequently expressing strong agreement. In adjusted analyses, gender–provider specialty interactions were largely non-significant, indicating consistent effects across intensive care, emergency medicine, and geriatric medicine, except for medication review statements where a significant interaction ($P = 0.021$) suggested variability across specialties.

Conclusions: In this exploratory secondary analysis, participant gender was associated with differences in agreement with selected consensus-based recommendations for the management of very old patients in ICUs, particularly those involving multidisciplinary team input. These findings highlight differences in perspectives toward specific recommendations within this international expert panel.

Introduction

The gender of healthcare providers has been shown to influence patient care through multiple mechanisms, including communication patterns, provision of preventative care, counseling, mortality rates, and hospital readmissions.[1–4] Female healthcare professionals often conduct longer consultations and engage more in partnership building, provide more comprehensive information, and show greater attention to psychosocial aspects of health, reassurance, and encouragement compared with their male colleagues.[4] Importantly, gender does not act in isolation; other factors, such as age, ethnicity, socioeconomic status, and occupational context, also shape communication style and professional behavior.[5]

A substantial literature describes gender-related differences in clinical practice. Patients treated by female practitioners often achieve better control of chronic disease markers and have lower mortality and readmission rates in hospital medicine.[6–10] These differences are frequently attributed to greater adherence to clinical guidelines and more patient-centered communication, suggesting that gender influences clinical decision-making, communication styles, and the organization of patient care within healthcare teams.[11]

The effect of provider gender has not been well studied in the intensive care unit (ICU). One study found that female gender of the patient and treating physician diminishes the likelihood of restricted health resource use,[12] whilst another found physician gender did not have a significant influence on ICU admission decisions (accept *vs.* refuse) in a hypothetical interview format.[13] The European Society of Intensive Care Medicine (ESICM) recently developed consensus-based recommendations for managing very old ICU patients (≥80 years), highlighting the need for multidisciplinary input under conditions of high acuity and resource constraints.[14] However, little is known about how provider gender influences agreement with such recommendations, particularly in decisions around life-sustaining therapies, rehabilitation, and specialist involvement.

This study aimed to examine the influence of healthcare provider gender on agreement with consensus-based recommendations for the management of very old patients in intensive care.

Methods

Study design and setting

This study represents a secondary analysis of data generated during an international Delphi process conducted by the ESICM to develop consensus recommendations for the management of very old ICU patients (≥80 years). The Delphi process involved a multinational panel of clinicians with expertise in intensive care, emergency medicine, and geriatric medicine.

Development of statements and Delphi process

An expert steering group consisting of 28 specialists generated 59 candidate statements based on a review of the literature and expert discussion covering fundamental principles, goals-of-care, ICU admission, treatment decision-making, and post-discharge management. Additional experts were invited to participate through ESICM networks and collaborating professional societies involved in the development of the recommendations. In total, 82 additional experts participated in the two rounds of the Delphi survey. Participants rated their level of agreement with each statement using a 9-point Likert scale. Consensus was defined *a priori* as ≥90% agreement or disagreement for strong consensus and ≥80% agreement or disagreement for moderate consensus, based on responses within the three highest or three lowest categories of the scale. Following completion of the Delphi rounds and discussion of the results, the steering committee issued recommendations for 48 statements for which consensus had been achieved.[14]

For the present secondary analysis, we focused on the 26 statements that achieved moderate consensus, as these represent areas where expert opinion showed greater variability compared with statements reaching strong consensus. Descriptive gender comparisons for all 93 Delphi statements are additionally presented in Supplementary Table S1. Agreement with each statement was measured on a Likert-type scale from 0 (strongly disagree) to 9 (strongly agree), converted to a 0–100 scale for analysis. Primary analyses compared mean agreement scores between female and male participants using independent-samples *t*-tests for each statement. In addition, analyses of strong agreement proportions (score = 9) were performed to compare response distributions between genders. Respondents reported their gender (male, female, or "prefer not to say"), clinical provider category (emergency medicine, geriatric medicine, intensive care, or other), and age group (<40 years, 40–49 years, 50–59 years, ≥60 years). Participants who did not report gender were excluded from gender-stratified analyses because of the low number of respondents in this category.

Statistical analyses

The primary analysis sample included participants with available gender and provider-category data. Missing data were handled on an analysis-specific basis. For each statement or regression model, participants with missing data for the relevant outcome or included covariates were excluded only from that specific analysis. Consequently, sample sizes varied slightly across analyses depending on data completeness.

Agreement scores between female and male participants were initially compared using independent-samples *t*-tests for each statement. For statements showing statistically significant gender differences, we further described the magnitude and direction of these effects.

To examine whether gender differences were consistent across provider categories, for each statement, we fitted a two-way analysis of variance (ANOVA) model with factors for Gender, Provider Category, and their interaction. The interaction term tested whether the gender effect varied across provider categories. Type III sums of squares were used to account for unbalanced group sizes. For statistically significant interaction effects ($P \leq 0.05$), post hoc pairwise comparisons were performed using Holm-adjusted *P*-values. Interaction plots of estimated marginal means were generated for statements demonstrating significant interactions.

For each statement, we additionally fitted multivariable regression models including gender, provider category, age group, and interactions between gender and provider category and between gender and age group. These analyses were conducted to assess whether observed gender differences persisted after adjustment for provider category and age.

Results

The primary analysis sample included 128 participants with available gender and provider-category data (53 female and 75 male respondents). Sample sizes for individual analyses varied slightly according to data completeness for each statement. The breakdown by specialty is in Supplementary Table S2. Female participants reported significantly higher agreement scores for several specific aspects of care, including medication review, transfer to geriatric wards, speech and language therapy, dietician and clinical pharmacist support (mean differences approximately 7.4–11.0 points on a 0–100 scale, $P < 0.050$) (Table 1, Figure 1 and Supplementary Figure S1). In contrast, male participants reported significantly higher agreement regarding decisions to limit life-sustaining therapy based on expected functional outcome ($P < 0.05$).

Proportion analyses showed similar patterns, with females more frequently expressing strong agreement for recommendations involving rehabilitation, nutrition support, pharmacist involvement, medication review, speech and language therapy, geriatric ward transfer, social worker advice, physiotherapy, and post-ICU recovery support (e.g., absolute differences of 15%–20% in some domains; Supplementary Table S3). Detailed mean agreement scores and gender comparisons for the 26 selected statements are presented in Supplementary Table S4, with exploratory comparisons for all Delphi statements provided in Supplementary Table S5.

Two-way ANOVA analyses demonstrated that most interactions between Gender and Provider were non-significant, indicating generally consistent patterns across provider categories. The only statistically significant interaction was observed for the medication review statement (interaction $P = 0.028$), suggesting variability in gender-related agreement across provider specialties for this domain (Supplementary Table S6; Figure 2). Provider category independently influenced responses for selected statements, including decisions regarding limitation of life-sustaining therapy and readmissions to hospital.

Table 1
Summary of the six statements with significant gender differences.

Characteristic	Female	Male	MD	95% CI	*P* value
Medication review should be undertaken by an appropriate healthcare professional, e.g., clinical pharmacist, geriatrician or other with specialist interest in the care of older patients, to minimize preventable adverse drug events.	91.9 ± 15.9 (n = 51)	81.0 ± 22.9 (n = 73)	11.0	4.1–17.9	0.002*
Decisions to limit life-sustaining therapy should be based on expected functional outcome.	81.2 ± 19.7 (n = 52)	87.8 ± 15.4 (n = 74)	−6.6	−13.1 to −0.1	0.045†
Very old patients should be transferred from ICU to a geriatric ward (if available).	86.9 ± 20.1 (n = 51)	78.7 ± 19.5 (n = 72)	8.2	1.0–15.4	0.026†
Dietitians for optimizing nutrition	93.0 ± 15.2 (n = 51)	85.6 ± 17.5 (n = 71)	7.4	1.5–13.3	0.014†
Speech and language therapists to advise the ICU team	88.9 ± 17.1 (n = 51)	80.6 ± 20.1 (n = 70)	8.3	1.5–15.0	0.016†
Clinical pharmacists for medication-related advice	90.4 ± 14.9 (n = 51)	81.8 ± 18.9 (n = 71)	8.6	2.5–14.6	0.006*

CI, Confidence interval; ICU, Intensive care unit; MD, Mean difference.
* $P < 0.01$.
† $P < 0.05$.

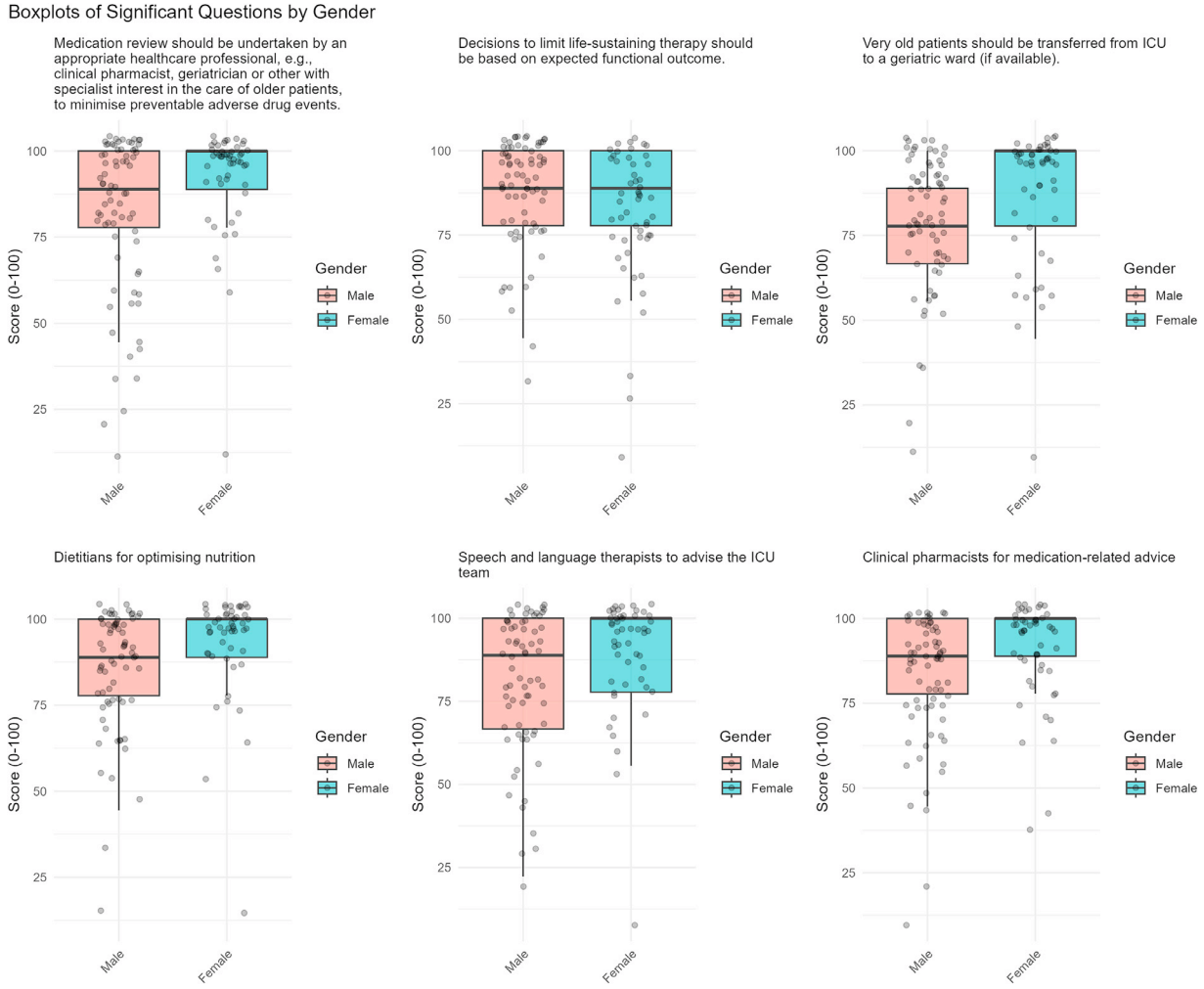

Figure 1. Boxplots of agreement scores for items with significant gender effects.

Multivariable regression analyses largely confirmed the findings from the two-way ANOVA models (Supplementary Table S1). The interactions between Gender and Age were not statistically significant for any statement, and age group did not demonstrate independent associations with agreement scores across statements. Provider category remained independently associated with selected statements related to limitation of life-sustaining therapy, vasopressor/hemodynamic monitoring, and hospital readmissions. The interaction between Gender and Provider remained statistically significant only for the medication review statement. Across analyses, observed gender differences were limited to selected domains, particularly recommendations involving multidisciplinary and geriatric-focused care, while most statements showed no statistically significant gender effects after adjusted analyses.

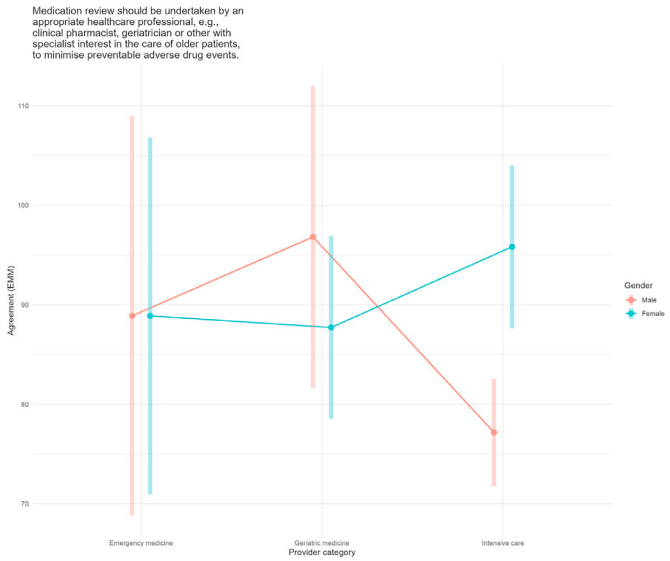

Figure 2. Interaction plot for agreement scores on medication review statements by gender and provider specialty (estimated marginal means).

Discussion

In this secondary analysis of an international Delphi consensus on the management of very old ICU patients, we found no gender differences in most recommendations. However, provider gender was associated with differing levels of agreement for a subset of recommendations, particularly those involving multidisciplinary input, such as medication review, pharmacist consultation, nutritional optimization, speech and language therapy, and geriatric-focused care. Female providers generally expressed higher levels of agreement with these recommendations, suggesting a greater emphasis on collaborative, multidisciplinary models of care, while male providers reported higher agreement regarding limitation of life-sustaining therapy based on expected functional outcome. Although several unadjusted gender differences were identified, most adjusted analyses demonstrated limited independent gender effects.

A wide body of literature has examined gender-related differences in clinical practice across specialties. Patients of female physicians have been shown to achieve better control of chronic disease markers, including HbA1c, blood pressure, and lipids, and are more likely to receive antihypertensive therapy and structured education programs.[6] In hospital medicine, elderly patients treated by female internists have demonstrated lower mortality and readmission rates than those treated by male internists, with adherence to clinical guidelines and patient-centered communication cited as a mediator.[7] Beyond medicine, gender differences are also evident in other professional groups: pharmacists show gender- and age-related variation in their knowledge and use of drug information resources,[9] while nurses demonstrate differing scopes of practice, with male nurses more often performing technical tasks and female nurses more engaged in counseling and communication roles.[10] Collectively, these findings highlight that gender influences not only medical decision-making, but also team function and the delivery of holistic patient care.

Our findings align with previous literature suggesting that female healthcare professionals may place greater emphasis on holistic and collaborative aspects of patient care.[3,10] Our results resonate with evidence from primary care and hospital medicine, where patients treated by female physicians have demonstrated better outcomes, including lower mortality and readmission rates.[7,8,15,16] The present results extend these observations to ICU settings, highlighting potential attitudinal differences in how multidisciplinary care processes are valued. At the same time, the absence of gender differences for most items indicates broad consensus among providers, suggesting that shared professional identity and ICU culture may mitigate individual-level variation in many aspects of care.

In this study, we examined gender differences in provider agreement with statements relating to multidisciplinary aspects of ICU care. It is notable that gender effects in our analysis were largely consistent across provider categories (intensive care, emergency medicine, geriatrics), with the exception of the medication review, where variability across disciplines was observed. This suggests that while professional training and clinical context play an important role, gendered perspectives may exert a stable influence on how consensus-based recommendations are interpreted and prioritized. Our findings suggest that provider gender may be associated with differences in agreement with selected consensus recommendations. These findings relate to participants' responses to Delphi statements and should not be interpreted as evidence of differences in clinical practice or implementation.

Several implications arise from this work. First, awareness of potential gender-related differences in provider perspectives may contribute to a better understanding of the factors associated with variation in agreement with consensus recommendations. Relatively few studies have examined the influence of participant characteristics on guideline development; a recent systematic review reported that male gender and physician status were associated with greater levels of contribution.[17] However, these findings were derived primarily from guideline development panels rather than Delphi processes and may not be directly applicable to the present study. Nevertheless, understanding group dynamics remains important. In an observational study of a multidisciplinary guideline development panel, Pagliari and Grimshaw[18] found that consultants and senior experts contributed substantially more to discussions than general practitioners, nurses, and allied health professionals, despite the group functioning effectively overall. The authors also observed that the three least active contributors were women from allied health or nursing, although the study was not designed to specifically evaluate gender effects. Taken together, these findings suggest that participation in consensus development may be influenced by the complex interplay of gender, professional role, and seniority.[18] While Delphi methods may reduce some hierarchical influences through anonymous scoring, ensuring diverse representation and equitable participation remains important to ensure hierarchy does not outweigh equality in the development of consensus recommendations. These results underscore the value of ensuring diverse representation in guideline development processes, as heterogeneity of perspectives may strengthen the robustness and acceptability of recommendations. Finally, further research is needed to examine whether provider gender translates into measurable differences in patient outcomes for very old ICU patients, particularly in areas such as rehabilitation, nutrition, and medication safety.

Limitations

This study has limitations. The analysis was based on survey data, and agreement with recommendations does not necessarily equate to practice behaviors. Gender was self-reported in binary categories, precluding exploration of intersectional influences such as age, cultural background, or professional seniority. Moreover, while responses were drawn from an international multiprofessional cohort, the distribution of respondents may not fully represent global ICU practice. The original Delphi process recruited a large multinational and multidisciplinary panel of clinicians with expertise in the care of very old critically ill patients, including specialists from intensive care, geriatric medicine, and emergency medicine. However, participants were selected through ESICM and professional networks based on their expertise rather than through random sampling. Consequently, while the panel provides a broad range of expert perspectives from different healthcare systems, it may not be fully representative of the wider ICU community. The primary analyses focused on statements achieving moderate consensus, although exploratory descriptive comparisons were additionally performed across all Delphi statements. Nonetheless, the study provides novel insights into how gender may shape professional perspectives on consensus recommendations for the very old in intensive care.

Conclusions

Taken together, these results suggest that gender-related differences in agreement were limited to selected domains of ICU care, particularly recommendations involving multidisciplinary and geriatric-focused care. Female providers more strongly endorsed multidisciplinary aspects of care, with consistent differences across both mean and proportion analyses, whereas male providers reported higher agreement regarding limitation of life-sustaining therapy based on expected functional outcome. While most gender-provider interactions were non-significant, a notable exception was observed for the medication review statement, where female providers' agreement varied more by provider group. However, most adjusted analyses demonstrated limited independent gender effects, suggesting that professional context and other provider characteristics may also contribute to variation in perspectives regarding the care of very old ICU patients.

CRediT Authorship Contribution Statement

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Ethics Statement

Not applicable.

Conflict of Interest

The author is an Editorial Board Member/Editor-in-Chief/Associate Editor/Guest Editor for this journal and was not involved in the editorial review or the decision to publish this article.

Data Availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Declaration of Generative AI and AI-Assisted Technologies in the Manuscript Preparation Process

During the preparation of this work, the authors used ChatGPT for formatting and editing purposes. The authors reviewed and edited the output as needed and take full responsibility for the content of the published article.

Supplementary Materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jointm.2026.06.008.

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