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Ethical decision-making climate in the ICU: theoretical framework and validation of a self-assessment tool

Bo Van den Bulcke,[1] Ruth Piers,[2] Hanne Irene Jensen,[3,4] Johan Malmgren,[5] Victoria Metaxa,[6] Anna K Reyners,[7] Michael Darmon,[8] Katerina Rusinova,[9] Daniel Talmor,[10] Anne-Pascale Meert,[11] Laura Cancelliere,[12] Làszló Zubek,[13] Paolo Maia,[14] Andrej Michalsen,[15] Johan Decruyenaere,[1] Erwin J O Kompanje,[16] Elie Azoulay,[17] Reitske Meganck,[18] Ariëlla Van de Sompel,[19] Stijn Vansteelandt,[19] Peter Vlerick,[20] Stijn Vanheule,[21] Dominique D Benoit[1]

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For numbered affiliations see end of article.

Correspondence to
Ms. Bo Van den Bulcke, Ghent University Hospital, Ghent 9000, Belgium;
bo.vandenbulcke@uzgent.be

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ABSTRACT

Background Literature depicts differences in ethical decision-making (EDM) between countries and intensive care units (ICU).

Objectives To better conceptualise EDM climate in the ICU and to validate a tool to assess EDM climates.

Methods Using a modified Delphi method, we built a theoretical framework and a self-assessment instrument consisting of 35 statements. This Ethical Decision-Making Climate Questionnaire (EDMCQ) was developed to capture three EDM domains in healthcare: interdisciplinary collaboration and communication; leadership by physicians; and ethical environment. This instrument was subsequently validated among clinicians working in 68 adult ICUs in 13 European countries and the USA. Exploratory and confirmatory factor analysis was used to determine the structure of the EDM climate as perceived by clinicians. Measurement invariance was tested to make sure that variables used in the analysis were comparable constructs across different groups.

Results Of 3610 nurses and 1137 physicians providing ICU bedside care, 2275 (63.1%) and 717 (62.9%) participated respectively. Statistical analyses revealed that a shortened 32-item version of the EDMCQ scale provides a factorial valid measurement of seven facets of the extent to which clinicians perceive an EDM climate: self-reflective and empowering leadership by physicians; practice and culture of open interdisciplinary reflection; culture of not avoiding end-of-life decisions; culture of mutual respect within the interdisciplinary team; active involvement of nurses in end-of-life care and decision-making; active decision-making by physicians; and practice and culture of ethical awareness. Measurement invariance of the EDMCQ across occupational groups was shown, reflecting that nurses and physicians interpret the EDMCQ items in a similar manner.

Conclusions The 32-item version of the EDMCQ might enrich the EDM climate measurement, clinicians' behaviour and the performance of healthcare organisations. This instrument offers opportunities to develop tailored ICU team interventions.

INTRODUCTION

Within the complex intensive care unit (ICU) environment, the main goals are to reduce morbidity and mortality associated with critical illness and to restore health without prolonging the suffering of patients.[1–5] However, over the last few decades the fast technical progress in organ support and increasing referral of patients with severe underlying comorbidities or poor functional status pose a significant challenge to ICU physicians, who are asked to find the right balance between supportive life-prolonging and palliative care.[6–12] In one of the largest studies of clinician perceptions of appropriateness of ICU care,[13] 27% of a total of 1651 interviewed European physicians and nurses perceived inappropriate care, chiefly excessive care, in at least one of their patients on the day of the study. Physicians ascribed prognostic uncertainty as the main reason to continue excessive care whereas nurses charged physicians with a lack of initiative and poor intradisciplinary and interdisciplinary communication.[14]

Creating a climate that promotes interdisciplinary value-based reflections rather than pure knowledge-based discussions is of utmost importance in the ICU.[11–21] Besides enriching the ethical decision-making (EDM) process for the benefit of the critically ill patient, thus reducing uncertainty in decision-makers,[12–14] open interdisciplinary communication also improves the well-being of healthcare professionals.[22–24] However, achieving a climate based on mutual respect which

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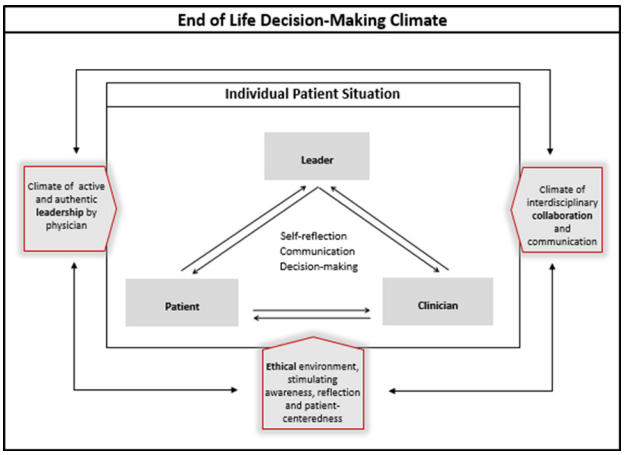

Figure 1 Theoretical framework.

encourages clinicians to examine their opinions, values, beliefs and attitudes through self-reflection is challenging and demands specific leadership skills.[25–30] Even though literature depicts differences in end-of-life (EOL) decision-making between countries,[31 32] focusing on multiple constructs like team culture and team climate in the ICU,[33–37] comprehensive instruments to measure and map EDM within ICUs are still lacking. The purpose of this study was to better conceptualise the EDM climate in the ICU and to validate a tool to assess EDM climates in a large multicentre cohort.

METHODS

Theoretical framework EDM climate in the ICU

After having completed a literature review, a group of experts in ethics (RP), psychology and communication (BVdB, SVH) and intensive care medicine (JD, DDB) identified three key EDM climate domains the questionnaire should cover (figure 1): (1) a clinician with his own background, values and history becomes aware of a specific patient situation and opens an interdisciplinary discussion; (2) a good team leader empowers clinicians to speak up while guaranteeing a safe environment; (3) sharing opinions, values and ideas stimulates ethical awareness within a team. This collective awareness enriches the EDM process for the benefit of the patient and supports the physician to make and effectively communicate decisions on patient care.

Interdisciplinary collaboration and communication

Different studies have highlighted the need to foster interdisciplinary discussions in general and at EOL within the ICU.[11–21 38] Failure in communication and poor collaboration (e.g., lack of mutual respect, dictatorial behaviours) among clinicians are the leading causes of inadvertent harm within the ICU.[39 40] While managing acute situations, practice of thinking out loud is important for generating a shared mental model among team members which invites others to contribute their thoughts and impressions about a specific patient situation.[13–21] In some ICUs, authoritative decision-making prohibits frontline professionals (nurses, junior physicians) from expressing their views for fear of being perceived as 'incompetent' or 'not respectful' towards higher ranked professionals, like physicians.[13–19] An optimal ICU team climate requires interdisciplinary communication and collaboration because teamwork is an iterative process of action and reflection.[25 26] Within well-functioning interdisciplinary teams, people believe that others will not resent or criticise them for asking for help, information or feedback. Good interdisciplinary collaboration starts with individuals who respect and recognise each other's professional identity.[13–21]

Leadership by physicians

ICU leadership is described by Reader and colleagues[29] as a complex set of functional and adaptive behaviours, where physicians attempt to (1) interpret challenges facing the ICU team (e.g., opening patient discussions), (2) make and effectively communicate decisions on patient care (eg, developing treatment escalation plans through promoting constructive questioning of key assumptions), and (3) manage the activities and needs of team members while prioritising patient safety (e.g., directive decision-making during crisis). It has been documented that physicians do better when they carefully listen to other team members and engage them in EOL decision-making.[6–9] A core function of the physician as an active, authentic leader is to develop a stable, open and safe environment where team members are supported to be self-reflective and become more conscious of their daily practice.[25–30]

Ethical environment

A good ethical working environment among clinicians has also been described as a crucial component of ICU functioning.[12–14 38 41 42] The ethical environment covers the organisational conditions and practices of the workplace that affect the way difficult patient care problems are discussed and decided; for example, tolerance of different opinions and values; possibility of ethical debate; empathic understanding provided by colleagues[14]; nurse-physician collaboration during EOL situations, presence of nurses during communication of EOL information; active involvement of nurses in EOL-DM,[6–9] and dealing with uncertainty concerning difficult decisions in the EOL-DM process.[12–14 38 41 42]

Overall, the EDM climate concerns clinicians' perceptions of daily ethical awareness and decision-making overall and at EOL. It is made up through respectful interdisciplinary collaboration and communication, authentic leadership by physicians and through a good ethical work environment.

The Ethical Decision-Making Climate Questionnaire

To measure the EDM climate we developed an instrument that is easy to administer, with a view to increase response rates (20 min to complete this questionnaire). The instrument was developed in the context of the DISPROPRICUS study, which aimed to assess whether the prognostic value of perceptions of excessive care by clinicians and the subsequent implementation of treatment limitation decisions is influenced by the quality of the EDM climate in the unit. The hypothesis was that perceptions of excessive care in better climates would be more informative about the 1-year outcomes compared with poorer climates because the better the climate, the more nurses and physicians share knowledge, experience and values. Following the best practice recommendations for scale construction, the questionnaire was developed through a modified Delphi iterative consultation process (four rounds) with the above mentioned experts.[43] Starting from the agreed three domains, BVdB did an extensive literature research for surveys or tools measuring (part of) the three domains. BVdB consulted individually SVH, JD, DDB and RP to select the most suitable tools and items to cover the three domains. BVdB summarised the answers and readdressed all members of the panel individually until consensus was reached. Finally, this panel agreed on a list of 35 items (online supplementary file 1) that address perceptions regarding each of the three key domains as set in our definition of EDM climate. Eleven questions concerning EOL practices were selected from the APPROPRICUS study questionnaire.[13] This list was extended with 24 extra questions from the Interprofessional Practice and Education Quality Scales (IPEQS) and the ICU Safety Attitude Questionnaire[44 45]: 11 questions were added on interdisciplinary reflection, collaboration and communication, and 13 on leadership skills of senior physicians.

Afterwards, international experts in the field of nursing (HIJ), intensive care (EA, JM) and ethics (EJOK) validated the final item selection. BVdB sent out the questionnaire by mail and collected the feedback of the experts individually. Only minor linguistic remarks were made. A list of 35 statements addressing all relevant aspects of EDM climate was created and validated (online supplementary file 1).

All proposed perceptions or statements were measured by participants' self-reported ratings of these 35 questions on a 4 or 5-point Likert scale online (no missing data). National coordinators recruited centres in their country. Translation/back translation procedures were used to obtain the version in the language of the participating countries that was semantically equivalent to the basic questionnaire in Dutch.[46]

Component interdisciplinary collaboration and communication (I1–I11)

To map the interdisciplinary collaboration and communication, 11 items of the IPEQS and the ICU Safety Attitude Questionnaire were selected.[44 45] The IPEQS is a 60-item self-assessment questionnaire developed within the European Interprofessional Practice and Education Network.[17 44] Our expert panel selected nine items from the questionnaire: five questions covering the conditions for interdisciplinary collaboration ('organizational factors'); one specific question related to the interdisciplinary work processes in the unit ('care processes factors'); and three more questions covering the individual interdisciplinary competence of the clinician ('attitudes and beliefs'). We added two extra questions about open safety culture in the ICU from the Safety ICU Questionnaire (I10 and I11). The panel considered these as complementary to the relevant IPEQS questions.

Component leadership by physicians (L1–L13)

Perceived leadership skills of the senior physicians in charge of daily patient care by the clinicians were examined through 13 questionnaire items. We selected 10 of the 100 questions from the Leader Behavior Description Questionnaire,[47] which all focus on daring to express an opinion and empowering team members. We added three additional questions about self-reflection and awareness of a specific patient situation, directed towards an ICU leader, which were formulated through the Delphi procedure, but were not available in existing questionnaires (L11–L13).

Component ethical environment (E1–E11)

Eleven validated questions, as used in the APPROPRICUS study,[13] assessed the conditions and practices that affect the ability of clinicians to engage in ethical practice and reflection, and the way which ethically challenging patient care problems are discussed and processed within the team.[10–14 17–27]

Psychometric evaluation of the Ethical Decision-Making Climate Questionnaire

To validate our preliminary version of the Ethical Decision-Making Climate Questionnaire (EDMCQ) we analysed the data collected during the first phase of the DISPROPRICUS study (March to June 2014).

Factorial validity of the EDMCQ

Using the answers to the 35 EDMCQ items, we reduced the data by factor analysis in a couple of latent variables, also called factors. Factor analysis was performed in two steps (exploratory and confirmatory factor analyses) using the statistical software R Studio V.3.1.2.[48–51]

First, an exploratory factor analysis was used to identify the underlying factor structure for the set of 35 items and to determine the number of latent factors, without making a priori assumptions about relationships among factors. The factor solution is based on Kaiser criterion, scree plot, the amount of variance explained and interpretability of the factors. A factor loading cut-off value of 0.30 was chosen to

decide which items were highly associated with a given factor. In interpreting the output, we defined that each factor should have at least three items with high factor loadings and items were not allowed to cross-load on more than one single factor. Second, confirmatory factor analysis was used to verify the goodness of fit of the underlying factor structure obtained during exploratory factor analysis. Hence, two a priori assumptions on the data structure were made. On the one hand, items with a substantial loading on a factor were related to that factor while a zero loading was assigned to a factor in case of a non-substantial loading (<0.30). On the other hand, we allowed for pairwise correlations between all factors, thereby relaxing the assumption of orthogonality. The adequacy of the model fit was evaluated using the comparative fit index (CFI), adjusted goodness-of-fit index, root mean square error of approximation (RMSEA), standardised root mean square residual and Akaike information criterion (AIC).

Measurement invariance of the items

To check whether two groups of clinicians—nurses and physicians—interpret the questionnaire items in the same way, we tested the measurement invariance of the selected model. We also assessed the possibility of measurement invariance among four different regions: North, East, South and West Europe plus the USA. If there is measurement invariance, it means that nurses and physicians, and clinicians working in different geographical regions, respectively interpret the EDMCQ items in an equal manner. The X^2 test indicates the amount of difference between expected and observed covariance matrices and was evaluated at a 5% significance level. If the null hypothesis holds, the test statistic approximates a X^2 distribution with 'q(q−1)/2−t' df (q=number of observed variables, t=number of free parameters in the defined structural equation model). The hypothesis of invariance is not rejected if the difference in CFI between a hypothetical model (H1), in which all factor loading parameters are equal across groups, and an unconstrained multigroup model (H0), is smaller than or equal to 0.1. If the RMSEA is ≤0.06 there is no immediate evidence of poor fit of the tested model.[49]

RESULTS

Characteristics of the participating ICUs and clinicians

Of 4747 clinicians working in 68 ICUs in 12 European countries (Belgium, Czech Republic, Denmark, France, Germany, Greece, Hungary, Italy, Portugal, UK, Sweden, the Netherlands) and the USA, 2992 (62.6%) completed the EDMCQ. Of the 3610 nurses and 1137 physicians providing ICU bedside care, 2275 (63.1%) and 717 (62.9%) participated respectively. Of the respondents, 858 (28.7%) were male and 2143 (71.3%) were female. ICU and clinicians' characteristics are shown in table 1.

Table 1 ICU and clinicians' characteristics*

ICU level	**n=68**
Country characteristics	
Geographical region	
Northern Europe	9 (13.2%)
Western Europe/USA	28 (41.2%)
Central Europe	19 (27.9%)
Southern Europe	12 (17.6%)
Hospital characteristics	
Hospital type	
University	37 (54.4%)
University affiliated	10 (14.7%)
Public	19 (27.9%)
Private	2 (2.9%)
ICU characteristics	
General	
Number of beds per ICU	10.0 (8.0–16.0)
ICU mortality in 2013 (%)	15.0 (9.8–20)
Organisation	
Patient-to-nurse ratio	2.0 (1.3–2.1)
Patient-to-doctor ratio	5.0 (2.0–7.0)
Clinician level	**n=2992**
Age (years)	38.0 (30.0–47.0)
Having a partner (yes)	2300 (76.9%)
Having children (yes)	1754 (58.6%)
Religious conviction	1611 (60.2%)
Non-religious	1190 (39.8%)
Religious conviction is important to very important in attitude towards EOL (yes)	453 (25.1%)
Role	
Nurse	2275 (76.0%)
Junior doctor	308 (10.3%)
Senior doctor†	409 (13.7%)
Years of experience in the ICU	8.0 (3.0–17.0)
Hours working in a week	38.0 (32.0–40.0)

*Results are expressed as number (%) and median (25th–75th percentiles).
†Including ICU heads.
EOL, end of life; ICU, intensive care unit.

Factor analysis of the EDMCQ

Exploratory factor analysis

The internal consistency of the 35-item survey as measured by the Cronbach's alpha was 0.897. We applied a varimax orthogonal rotation to create a straightforward factor structure. The Kaiser criterion and scree plot indicated that eight factors should be sufficient. However, the exploratory factor analysis with eight factors revealed that two questions, 'Physicians in charge do not abstain from explaining their actions' (L10-R) and 'It is not difficult to speak up if I perceive a problem with patient care' (I10-R), could not be attributed to a specific factor due to very low loadings on several factors, all below 0.25. Moreover, the item 'Physicians in charge let the team members know what is expected of them' (L-1) popped out at four factors

with factor loadings between 0.2 and 0.4 which could not be explained well. Due to the low interpretability, it was decided to remove these three questions from the analysis. After removing the three items, the factor analysis resulted in a theoretically meaningful seven-factor solution with a total of 46% explained variance. All items showed a high factor loading on one factor and low loadings on other factors. Moreover, a clear interpretation and conceptual meaning could be given to each factor. The labels of the seven factors and the loadings of the retained 32 items are mentioned in table 2.

Confirmatory factor analysis

First, a confirmatory factor analysis of a fully constrained measurement model in which each of the 32 items was assigned to load only on the factor on which they loaded highest in the exploratory factor analysis was performed. The variance of each factor was set to 1 to obtain standard normally distributed

Table 2 Results of the exploratory factor analysis of the EDMCQ scale (32 items)

	Questions	Loading*
	F1: Self-reflective and empowering leadership by physicians	
L-5	Physicians in charge help team members settle their differences.	0.493
L-6	Physicians in charge trust the team members to exercise good judgement.	0.549
L-7	Physicians in charge permit the team members to use their own judgement in solving problems.	0.651
L-8	Physicians in charge encourage initiative in the team members.	0.710
L-9	Physicians in charge treat all team members as their equals.	0.578
L-11	Physicians in charge are well aware of their own emotions and attitudes.	0.512
L-13	Physicians in charge dare to show their vulnerability.	0.429
	F2: Practice and culture of open interdisciplinary reflection	
I-1	There are regular opportunities for open informal dialogue between healthcare providers.	0.549
I-2	There is regular structured and formal dialogue between the various disciplines within the team to discuss patient care.	0.637
I-3	We regularly reflect on the quality of care provided from the various points of view of the staff.	0.703
I-4	The teams are well coordinated/managed.	0.568
I-5	There is an open and constructive culture in the department such that criticism can be easily expressed.	0.543
I-6	Discussions about patients lead to greater understanding and agreements.	0.514
I-11	The culture in my ICU makes it easy to learn from the errors of others.	0.365
	F3: Culture of not avoiding EOL decisions	
E-8†	Death is not perceived as a treatment failure, so decisions to withdraw or withhold therapy are seldom postponed.	0.409
E-9†	EOL decisions are not frequently postponed.	0.472
E-10†	Patients with little chance of recovery are not frequently admitted.	0.709
E-11†	Patients with little chance of recovery do not frequently occupy an ICU bed which other patients would benefit more from.	0.778
	F4: Culture of mutual respect within the interdisciplinary team	
I-7	I am always regarded and addressed by everyone in the team as a full-fledged team member.	0.683
I-8	Team members from another discipline respect my work.	0.694
I-9	I have confidence in the professional competence of my team members.	0.409
	F5: Active involvement of nurses in EOL care and decision-making (DM)	
E-5	Nurses are present during the communication of end-of-life information to the family.	0.720
E-6	Nurses are involved in end-of-life decision-making.	0.781
E-7	Nurses and physicians collaborate well with one another during end-of-life situations.	0.537
	F6: Active decision-making by physicians	
L-2	Physicians in charge make accurate and timely decisions.	0.536
L-3	Physicians in charge take full charge when emergencies arise.	0.625
L-4†	Physicians in charge are not hesitant about taking initiative in the group.	0.439
L-12	Physicians in charge are well aware of their role model function.	0.390
	F7: Practice and culture of ethical awareness	
E-1	My colleagues understand my thoughts/feelings about difficult end-of-life decisions.	0.546
E-2	Different opinions and values concerning end of life are tolerated.	0.567
E-3	We talk about moral problems.	0.541
E-4	There is a structured, formal debriefing after difficult patient care situation.	0.562

*The relationship of each variable to the underlying factor is expressed by the so-called factor loading.
†Items that are reverse scored.
EDMCQ, Ethical Decision-Making Climate Questionnaire; EOL, end of life; ICU, intensive care unit.

Table 3 Results of the confirmatory factor analysis of the EDMCQ scale (32 items)

Model	Description	CFI	AGFI	RMSEA	SRMR	AIC
1	Fully constrained	0.716	0.727	0.083	0.217	214 974.9
2	Some correlation	0.799	0.834	0.071	0.192	212 148.7
3	Unconstrained	0.891	0.897	0.053	0.048	208 986.7

AGFI, adjusted goodness-of-fit index; AIC, Akaike information criterion; CFI, comparative fit index; EDMCQ, Ethical Decision-Making Climate Questionnaire; RMSEA, root mean square error of approximation; SRMR, standardised root mean square residual.

scores which could then easily be compared between factors (model 1: fully constrained). In a second model, the assumption of orthogonality applied during exploratory factor analysis was relaxed and correlation between items within the same domain of the EDM climate was allowed (model 2: some correlation). In a third model, correlations between all seven factors were also allowed (model 3: unconstrained). Given our assumption that crucial EDM climate factors cohere meaningfully (eg, a practice and culture of open interdisciplinary reflection in a team is associated with a culture of mutual respect within the team) these correlates make sense. An overview of goodness-of-fit measures for the three measurement models is shown in table 3.

The goodness-of-fit indices did not pass the specified criteria for the first two models; however, a significant improvement was obtained when relaxed constraints on factor correlations were set (model 3). The decrease in AIC confirmed the better fit for model 3. Moreover, the average of the absolute differences in predicted and observed covariances was only 0.048 for model 3, and the distribution and range of the normalised residuals improved only if no constraints on factor correlations were specified. In conclusion, the third unconstrained measurement model allowing all seven factors to be correlated was selected as the final model and thought to be well identified and the correct model to the data at hand.

Measurement invariance

Across two occupational groups (nurses and physicians), we observed no statistical difference in the interpretation of the EDMCQ scale items. As seen in table 4, the RMSEA shows a good fit of our tested model.

We observed that CFI H0=0.965 and CFI H1=0.966. The difference between both values was clearly smaller than 0.1, which confirms that there is no evidence to reject the assumption of measurement invariance. Also, across different geographical

Table 4 Results of measurement invariance of the EDMCQ scale (32 items) across two occupational groups (nurses and doctors) and across geographical regions

Nurses and doctors	χ^2	df*	P†	CFI	RMSEA
Model 1: Equal loadings	661.03	992	0.00	0.965	0.052
Model 2: Free loadings	660.05	992	0.00	0.966	0.052
Geographical regions					
Model 1: Equal loadings‡	3625.85	886	0.00	0.970	0.0507
Model 2: Free loadings‡	3803.50	911	0.00	0.968	0.0514
Model 1: Equal loadings§	2473.62	886	0.00	0.963	0.0536
Model 2: Free loadings§	2643.34	911	0.00	0.960	0.0553
Model 1: Equal loadings¶	2970.55	886	0.00	0.955	0.0586
Model 2: Free loadings¶	3116.50	911	0.00	0.953	0.0594
Model 1: Equal loadings**	3323.28	886	0.00	0.970	0.0527
Model 2: Free loadings**	3807.94	911	0.00	0.969	0.0530
Model 1: Equal loadings††	4209.27	886	0.00	0.966	0.0554
Model 2: Free loadings††	4361.27	911	0.00	0.965	0.0558
Model 1: Equal loadings‡‡	2446.21	886	0.00	0.961	0.0586
Model 2: Free loadings‡‡	2528.59	911	0.00	0.960	0.0588

*'q(q−1)/2−t' df (q=number of observed variables, t=number of free parameters).
†5% significance level.
‡Northern versus Western.
§Northern versus Central.
¶Northern versus Southern.
**Western versus Central.
††Western versus Southern.
‡‡Central versus Southern.
CFI, comparative fit index; EDMCQ, Ethical Decision-Making Climate Questionnaire; RMSEA, root mean square error of approximation.

regions, all differences between CFI H0 and CFI H1 across regions were smaller than 0.1, which confirms measurement invariance across regions.

DISCUSSION

To our knowledge, this is the first large-scale quantitative study that validates a measurement instrument to assess the EDM climate in the context of ICUs: the EDMCQ. The instrument covers different domains discerned in literature: interdisciplinary collaboration, leadership by physicians and ethical environment. The final version consisting of 32 items was constructed by means of exploratory factor analysis, and further validated by means of confirmatory factor analysis. Factor analysis revealed that the EDMCQ allows the measurement of seven latent factors regarding clinician's EDM in a factorial valid manner. A subsequent test of measurement invariance indicated that the factor structure is invariant across professional groups and across geographical regions. This implies that for nurses and physicians, and for clinicians working in different regions, the EDMCQ items have the same meaning.

Interdisciplinary communication and collaboration, which is the first domain discerned in our literature review, is covered by two factors: the first is *culture of mutual respect*, comprising interdisciplinary attitudes towards and from other team members. Indeed, respectful relationships with shared responsibilities are necessary to provide optimal patient care and contribute towards establishing an effective reflective attitude towards ICU functioning among the team members.[13–26] The second is *practice and culture of open interdisciplinary reflection*, and assesses if fundamental conditions for interdisciplinary work are met. This factor encompasses daily interdisciplinary dialogue around patient care throughout team meetings, and maps if these meetings take place in an open atmosphere where each team member can speak out their concerns, thoughts and beliefs.

The second domain, leadership by physicians, is represented by two factors: s*elf-reflective and empowering leadership*, where the EDMCQ maps whether physicians in charge show respect and encourage other team members to speak without fear, and whether they are aware of their attitudes and emotions. Indeed, the way in which physicians in charge guide the team is a principal factor affecting team climate.[27–30] *Active decision-making by physicians* covers key issues for physicians in charge: timely and accurate decision-making, taking initiative, responsibility as role model in the ICU. This EDMCQ factor maps whether ICU leadership is responsible and accountable for empowering other team members, creating solutions and managing the decision-making process.

As a third key condition for a good EDM, an ethical environment should be installed and supported by the leaders and all other team members.[10–14 17–27 41–43] Three factors cover ethical environment: *active involvement of nurses in EOL care* maps beliefs of team members concerning the involvement of nurses in EOL care practice and decision-making. If different professions share the responsibility for EDM practice, nurses and physicians collaboration stimulates a climate where EOL decisions are not postponed.[13 14 40–42] *Culture of not avoiding EOL decisions* concerns the extent to which teams postpone decisions to withhold or withdraw therapy. *Practice and culture of ethical awareness* reflects team members' opinions about how the ICU team takes action to address moral and ethical problems. Different studies have concluded that debriefings and ethical discussions are crucial for clinicians, allowing them to recognise and resolve distress.[13 14 17 40–42]

We propose the seven-factor EDMCQ scale as a tool the ICU team can use in order to achieve optimal EDM. Since ethical debate and decision-making is becoming a core issue in healthcare nowadays, our instrument might be used as a generic tool to assess, monitor and compare the EDM climate among employees, in work teams and organisations at large. It could also be used in different healthcare settings as well. The EDMCQ scale items could easily be modified and adapted to specific settings (e.g. geriatrics, paediatrics).

Further qualitative studies using team observation and interviews could help enclose the 'EDM climate' concept. More in-depth qualitative studies are in order to elucidate the interpersonal processes cohering with the EDMCQ factors.[52 53] Future research is also desirable regarding potential antecedents and outcomes of the EDM climate at clinician (e.g. intent to quit, moral distress, burnout), patient (e.g. outcome, treatment limitation decisions), family (e.g. satisfaction, psychological burden), unit (e.g. quality of service) and organisational level (e.g. organisational commitment) as well. Finally, intervention studies could be developed aiming to enhance the EDM in individuals, groups and healthcare organisations at large.

Our study has some limitations. First of all, we only studied the factorial validity and measurement invariance of the EDMCQ and did not include other psychometric tests or comparisons with other measures or indicators of ICU climate or EOL care practice. Second, we did not include other ICU professions or consultant physicians in our study. We decided to develop an instrument that works for clinicians who are continuously exposed to the same pathology in an ICU before further fine-tuning the EDM process with referring physicians. The EDMCQ scale needs to be validated in these other groups, and might also be validated in other hospital wards. Finally, we chose to perform a quantitative study and did not explore meanings associated with interdisciplinary ICU work using qualitative research. Nevertheless, our instrument enables ICUs to take a 'snapshot' of relevant aspects of EDM among their team members. The EDMCQ might be used as

a validated tool to inform clinicians how their leaders and colleagues handle everyday EDM.

CONCLUSION

As the extent and quality of EDM becomes increasingly important in healthcare, our EDMCQ scale proposes the necessary conditions for (1) stimulating awareness and (self-) reflection in team members, enabling them to speak up if they perceive inappropriate care, (2) improving interdisciplinary collaboration and communication to fully appreciate the patient's views, and (3) stimulating active and empowering leadership in clinicians, as well as decision-making adapted to the patient's needs. By taking EDM into account and managing it well, our scientifically embedded tool might facilitate and contribute to the strengthening of the psychosocial well-being of patients, clinicians and their organisations as well.

Author affiliations
[1]Department of Intensive Care Medicine, Ghent University Hospital, Ghent, Belgium
[2]Geriatrics, Department of Internal Medicine, Ghent University Hospital, Ghent, Belgium
[3]Department of Anaesthesiology and Intensive Care, Sygehus Lillebælt Vejle Sygehus, Vejle, Denmark
[4]Institute of Health Research, University of Southern Denmark, Odense, Denmark
[5]Department of Anaesthesiology and Intensive Care, Sahlgrenska University Hospital, Gothenburg, Sweden
[6]King's College Hospital, London, UK
[7]Department of Medical Oncology, University of Groningen, Groningen, Netherlands
[8]Medical-Surgical Intensive Care Unit, Hopital NordSaint-Etienne University Hospital, Saint-Etienne, France
[9]Department of Anaesthesiology and Intensive Care, First Faculty of Medicine, Charles University in Prague and General University Hospital in Prague, Prague, Czech Republic
[10]Department of Anesthesia, Critical Care and Pain Medicine, Beth Israel Deaconess Medical Center and Harvard Medical School, Boston, Massachusetts, USA
[11]Service des Soins Intensifs et Urgences Oncologiques, Institut Jules Bordet, ULB, Bruxelles, Belgium
[12]SCDU Anestesia e Rianimazione, Azienda Ospedaliero-Universitaria, 'Maggiore della Carità', Novara, Italy
[13]Department of Anesthesiology and Intensive Therapy, Semmelweis University Budapest, Budapest, Hungary
[14]Department of Intensive Care, Hospital de Santo António, Porto, Portugal
[15]Department of Anaesthesiology and Critical Care Medicine, Tettnang Hospital, Tettnang, Germany
[16]Department of Intensive Care, Erasmus MC University Medical Center Rotterdam, Rotterdam, The Netherlands
[17]Medical Intensive Care Unit, Hôpital Saint-Louis and University Paris-7, Paris, France
[18]Department of Psychoanalysis and Clinical Consulting, Ghent University, Ghent, Belgium
[19]Department of Applied Mathematics, Computer Sciences and Statistics, Faculty of Sciences, Ghent University, Ghent, Belgium
[20]Department of Personnel Management, Work and Organizational Psychology, Ghent University, Ghent, Belgium
[21]Department of Psychoanalysis and Clinical Consulting, Faculty of Psychology and Educational Sciences, Ghent University, Ghent, Belgium

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