

ORIGINAL ARTICLE

A preliminary study on the quality of the intensive care medicine training programmes in the Netherlands

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Abstract

Background: Setting up a quality assurance system for postgraduate medical training includes monitoring the training environment and the functioning of the clinical supervisors. This study assesses the quality of the postgraduate training programmes in intensive care medicine in Dutch teaching hospitals.

Methods: Two validated questionnaires, the Dutch Residents' Educational Climate Test (D-RECT) and Maastricht Clinical Teaching Questionnaire (MCTQ+) were used, which assess the training environment and the quality of the clinical supervisors, respectively. All 82 intensivists-in-training were asked to complete the questionnaires.

Results: The response rate was 45% for the D-RECT and 38% for the MCTQ+. The average scores over all the items in both the D-RECT and the MCTQ+ questionnaires were in the range of 4 (on a five-point scale) for almost all centres. The grade (on a ten-point scale) for the functioning of the clinical supervisors in the MCTQ+ was above a 7½. A significant correlation between the average scores on both instruments was found. Respondents mentioned many strengths of the training programmes in the D-RECT and MCTQ+. Suggestions for improvement were also provided and focused on seven and three aspects of the training programme, respectively.

Conclusions: The postgraduate intensive care medicine training programmes in the Netherlands are of good quality, with a limited number of specific points of attention per centre. A number of suggestions for further improvement of the training programme *in general* were provided, most of which suggest a leading role for each local training centre.

Introduction

Competency-based training necessitates a training framework which includes a detailed description of tasks, learning objectives and responsibilities for both trainees and clinical educators.^[1] In the Netherlands, the competency domains, initially identified by the European Society of Intensive Care Medicine, have been applied to the Dutch intensive care training programme in the document 'The Intensive Care Medicine training programme.'^[2] Internal and external quality assurance practices are crucial in maintaining high-quality training programmes, such as the Dutch Intensive Care training programme.^[3,4] Good quality assurance is characterised by structural and systematic data collection on all relevant aspects of the educational programme at timely intervals, followed by enough time to implement improvements suggested by the quality assurance data. The evaluation activities should be integrated within the daily practices of an educational programme involving all stakeholders.^[5] Recently, these systematic, structural and integrated aspects of quality assurance were translated to the postgraduate training programmes in the Netherlands, for which a working group (Scherpbier 2.0 report) described quality assurance practices and strategies.^[6] Such a quality assurance system, in which the external quality assurance measures are supportive of the internal quality assurance frameworks, will soon become mandatory for all postgraduate training programmes. The Scherpbier 2.0 report, finalised in December 2015, indicated that quality assurance frameworks should focus on the areas Organisation and Development; Learning, Teaching and Working Climate; Faculty Development and Competency Development, as derived from the current literature.

One of the quality indicators is the teaching and learning climate,^[6] which can be defined as the atmosphere, tone

and culture or personality of an institution or department.^[7] The teaching and learning, or educational climate is a major determinant of the effectiveness of a training programme regarding development of the required competencies.^[8] The Dutch General Medical Council ('College voor Geneeskundige Specialisten', GCS) refers to a favourable educational climate when 'the prerequisites are met for creating and maintaining an educational training programme with an optimal yield for the individual physician trainee.'^[9] Interaction with staff members contributes to the educational climate. The staff members formally responsible for the programme play a pivotal role herein, and their personal contact with the trainees is especially valued. Apart from this personal interaction, the role of formal supervisors has gained interest over the last decades.^[10] Likewise, evaluation of the supervisors is increasingly emphasised.^[11] Even more recent, enhanced clinical supervision of trainees has been associated with improved patient- and education-related outcomes.^[12,13] However, measuring the quality of the educational climate on one hand, and the role of the supervisors on the other hand, was not common practice in all Dutch Intensive Care Medicine training programmes at the time of this study.

Aim

The aim of this study was to obtain a first impression regarding the quality of the training programmes in intensive care medicine in the Netherlands.

Context and methods

Context

Intensive care medicine training in the Netherlands is scaffolded into a multidisciplinary access model with dual accreditation, for the primary specialty as well as intensive care medicine. Apart from trainees from internal medicine and anaesthesiology, an increasing number of colleagues have a background in cardiology, pulmonary medicine, and neurology. The training programme lasts two years.

Ethical approval

Permission was granted by the Joint Intensivists Committee (GIC), formally responsible for the general training programme in ICM. The Dutch Society for Intensive Care (NVIC) was pre-informed.

Data collection

All intensivists in training, hereafter called trainees, were asked to complete the Dutch Residents' Educational Climate Test (D-RECT) and the Maastricht Clinical Teaching Questionnaire (MCTQ+) (see further). The 82 trainees received the questionnaires by email in 2012, together with an introductory and explanatory letter regarding the study. Participation was voluntary. Non-responders were sent

one reminder. The response data were anonymised for data storage and analysis.

D-RECT

The D-RECT is a questionnaire for medical specialists in training and evaluates *the educational climate of the postgraduate training programmes*.^[14,15] The instrument is validated for the Dutch context,^[4] and its reliability and validity were recently reaffirmed.^[16] Apart from demographic and primary specialty training data, 11 factors, including supervision, coaching and assessment, feedback, teamwork, attendings' role, and formal education, are addressed.^[4] Overall scores on the D-RECT become reliable with a sample size of three or more, while 11 participants are needed for a reliable judgment per subscale.^[15]

MCTQ+

Since the D-RECT does not provide specific information regarding *the functioning of individual clinical teachers in the workplace*, we also used the Maastricht Clinical Teaching Questionnaire, or MCTQ+, which consists of five factors, and 21 items. The MCTQ+ is modified from the original MCTQ, primarily developed for use in undergraduate medical training programmes.^[11] Overall scores on the MCTQ become reliable with a sample size of 7 or more.^[4,11]

Analysis

Quantitative data analysis was performed using IBM SPSS software version 21.0. Only completed questionnaires were included. Considering the moderate overall number of trainees a limited number of respondents per centre was anticipated. The results for the D-RECT and MCTQ+ are therefore studied separately per centre as an aggregated total score over all items included in the factors in each questionnaire. Correlations between the mean scores on the D-RECT and the MCTQ+ were analysed using Pearson's correlation.

Principles of qualitative research were applied to the narrative answers for the open questions.^[17,18] The narrative feedback was transcribed verbatim. Sentences and sub-sentences addressing more than one subject were coded as separate comments. Comparable topics were thereafter aggregated into overarching categories. This so-called primary and secondary coding was performed by the first author, and subsequently checked by the second author. Any discrepancies in coding were discussed until consensus was reached.

Results

Quantitative results

The response percentage for completed questionnaires was 45% for the D-RECT and 38% for the MCTQ+. All training centres, with one exception, were given mean scores over all items in the questionnaires around the value 4 (on a five-point scale) for the D-RECT as well as the MCTQ+. The mean scores per centre are displayed in *table 1*. The mean grade for functioning

Table 1. Mean scores on the D-RECT and MCTQ+ questionnaires in the different training centres

Centre	D-RECT				MCTQ+						
	Number of fellows	Mean score	Range	SD	Number of fellows	Mean score	Range	SD	Mean grade	Range	SD
A	4	4.02	0.84	.39	2	4.12	0.59	.42	7.8	1.5	1.06
B	3	3.95	0.26	.15	4	3.91	0.59	.24	8.3	0.50	0.35
C	5	4.06	1.10	.44	5	3.73	1.41	.54	7.4	1.5	0.65
D	3	3.82	0.76	.39	3	3.90	0.65	.33	7.7	1.0	0.58
E	4	3.93	1.04	.49	4	4.01	1.00	.48	7.9	2.0	1.03
F	4	4.11	0.38	.18	4	3.90	0.82	.41	7.5	3.0	1.29
G	4	4.24	0.68	.30	2	4.06	0.12	.08	8.5	1.0	0.71
H	8	3.99	1.06	.35	8	3.77	1.35	.43	5.9	8.0	3.12
I	2	3.42	1.16	.82	1	4.06	n.a.	n.a.	8.0	n.a.	n.a.

The scores for the items in the questionnaires are on a five-point Likert scale; the grade for the functioning of the clinical supervisors on the MCTQ+ is on a ten-point scale. SD = standard deviation

of the clinical teachers on the MCTQ+ was 7.7 (range 5.9-8.5). There was a significant correlation between the mean scores on the D-RECT and the MCTQ+, with a Pearson correlation coefficient of 0.66.

Qualitative results

Thirteen narrative comments were provided in the D-RECT. Five narrative comments illustrated strengths of the training programmes, and eight suggestions for further improvements. The remarks related to two and seven aspects of the individual training programme, respectively. The mentioned strengths were 'Adequate training programme and good working climate' and 'Educational structure and content'. The potential areas for improvement were: 'Working in multiple locations decreases collaboration and teamwork with other fellows', 'Variation in quality of teaching and educational qualities between staff members', 'Provision of feedback, both reinforcing and constructive', 'Bedside teaching', 'Busy daily clinical activities', 'Irregular working hours' and 'Limited time for self-study at home'. The results are displayed in *table 2*.

Table 2. Strengths and suggestions for further improvement as mentioned in narrative feedback in the D-RECT questionnaire, pertaining to the educational climate of the training programme

No.	Strengths	Number of times mentioned
1.	Adequate training programme and good working climate	4
2.	Educational structure and content	1
No.	Suggestions for further improvement	Number of times mentioned
1.	Working in multiple locations decreases collaboration and teamwork with other fellows	1
2.	Variation in quality of teaching and educational qualities between staff members	1
3.	Provision of feedback, both reinforcing as constructive	2
4.	Bedside teaching	1
5.	Busy daily clinical activities	1
6.	Irregular working hours	1
7.	Limited time for self-study at home	1
Total		13

In total, 94 strengths regarding the functioning of the clinical teachers were noted, relating to five different aspects. In addition, 56 suggestions for further improvement were provided, relating to three aspects. The five strengths related to 'Approachability of supervisors', 'Stimulation and motivation', 'Contributing to a pleasant and safe teaching environment', 'Competency', and 'Strength through diversity and unity'. The three areas for improvement related to 'Tailoring of the training programme', 'Necessity for faculty development programmes' and 'Content of training programme and frequency of educational activities'. The results are displayed in *table 3*.

Discussion

These preliminary results provide a generally positive impression of the quality of the intensive care training programmes in the Netherlands. In the next sections the results of the quantitative and qualitative analysis will be consecutively discussed in more detail.

Quantitative results

Most training centres thus received mean scores over all items in the questionnaires of around 4 (on a five-point scale) for both questionnaires. The notable exception (D-RECT) concerns one centre for which the mean score but also the number of respondents is limited. This combination could be a signal of potential improvement of the local educational climate, but further additional information is needed to substantiate the validity of this finding. For two centres (C and H) with the lowest mean scores on the MCTQ+ a substantial range of scores is noted, with a significant and sufficient number of respondents (5 and 8 respectively). Apparently, differences in perception and opinion regarding the quality of the training programmes exist between trainees. The programme director can further explore whether personal, situational or organisational factors contribute to these differences. Different causes obviously necessitate different solutions. Furthermore, the programme director monitors whether the issues identified represent isolated incidents, or are part of a structural problem regarding training, for which interventions by the educational team are necessary.

Table 3. Strengths and suggestions for further improvement as mentioned in narrative feedback in the MCTQ+ questionnaire, pertaining to the functioning of the clinical teachers in the workplace

No.	Strengths	Elements	Number of times mentioned
1.	Approachability of supervisors	- Helpfulness - Openness for discussion and exchange of thoughts	32
2.	Stimulation and motivation	- During educational sessions (e.g. instructive discussions during multidisciplinary meetings and handovers) - Encourage knowledge gathering - Give confidence - Display of exemplary professional behaviour, e.g. by enthusiasm and good mood - Interest in and commitment to providing good quality education and training - Mutual respect and trust - Take sufficient time for fellow guidance	25
3.	Contributing to a pleasant and safe teaching environment/atmosphere		17
4.	Competency	- Knowledge/evidence-based medicine - Good clinical expertise - Good communication skills, e.g.	13
5.	Strength through diversity and unity	- Diversity of the clinical educators - Providing feedback on medical issues from own primary speciality - Form a cohesive group, good teamwork and collaboration - Consistent and clear medical diagnosis and treatment plans	8
Total			94
No.	Suggestions for further improvement	Elements	Number of times mentioned
1.	Tailoring of the training programme	- To phase in the learning process - To the fellow's personal learning curve - To the fellow's background, prior speciality training	10
2.	Necessity for faculty development programmes	- Acquisition of skills regarding provision of feedback - Knowledge of recent changes in training programme - Further improvement of openness for suggestions and discussion by/ with fellows - Learn the boundaries of own knowledge and skills Uniform, consistent medical policy by all staff members - Contribution to the educational programme by all staff members: currently too much interpersonal variation - Less emphasis on guidelines for clinical practice - Communication, e.g. changes in patient management to be discussed timely with the fellow - Increase attention for refraining from medical treatment, and cessation of existing support and treatment	20
3.	Content of training programme and frequency of educational activities	- Enthusiasm and scheduling time for teaching: clinical patient care should not be fellows' only focus - Arouse and provoke, e.g. critical reflection on action, and gathering background knowledge - More direct supervision - Supervision, including the more generic competencies - More frequent provision of feedback, e.g. critical judgment of medical correspondence, and regarding the generic competencies - More formal educational session, e.g. bedside teaching, simulation sessions - More day shifts (since more learning moments arise) - More knowledge tests, e.g. daily, assessing common problems of practice - Increase formal learning based on issues arising during daily multidisciplinary meetings - Equity in distribution of tasks over trainees - Dedicated time for education without being approachable for patient care	26
Total			56

The grades for functioning of the clinical teachers on the MCTQ+ were mostly relatively high. The range of scores was again considerable for some centres. Notably, a low mean score for one centre (H) results from the scores given by eight respondents, however with a range of 8. Apparently one or more trainees are dissatisfied with the functioning of one or more clinical teachers in this centre, while the quality of the teaching climate, as evidenced by an average rating of 3.99, with a limited range, seems to be in order.

In addition, an overall significant correlation between the scores on the D-RECT and MCTQ is present studying all respondents in all centres. The number of respondents per centre is too limited to detect structural differences in correlation per centre. With increasing numbers of participants after future applications of the instruments, summation of data could generate complementary suggestions for specific improvements per centre.

A comparison of the present data with previous years was not possible, since neither the D-RECT nor the MCTQ+ were available and/or structurally used at the time. For the educational teams in each centre it is, however, useful to compare future results on the D-RECT and MCTQ+ with the contemporary results in a process of longitudinal monitoring.

Since the future number of respondents per centre will remain limited or even decrease due to reduction in the number of trainees admitted to the programme, aggregation of scores per factor in the questionnaires remains necessary in order to generate reliable results for each iteration, if at all possible. Acknowledging that some centres will train less than seven fellows at a particular point in time, other approaches will be needed. Qualitative methods, such as focus group 19 or individual interviews can perhaps play a role in further exploring the educational climate and the functioning of the clinical teachers. Apart from the trainees, other stakeholders such as staff members can be involved in such enquiries.

In addition to the local and national perspective generated by comparison of the present and past data for intensive care medicine training specifically, the directors of the local programmes can compare the intensive care medicine data on the D-RECT to the scores on the same instrument for other specialties. This may reveal not previously identified generic strengths or areas of potential improvements regarding the educational climate. The latter should be subject of debate among members of the regional central postgraduate training committees.

Qualitative results

The number of narrative comments, especially for the MCTQ+ questionnaire, was striking (see *table 3*). This rich response perhaps originates from the intensive day-to-day collaboration between individual staff members and trainees, whereas the limited number of comments on the D-RECT may represent the more abstract nature of the construct of 'the educational

climate'. Despite these limitations, the comments paint a picture of a safe, and pleasant learning and working climate with stimulating and skilled supervisors who, each from their own expertise and background in a collaborative team effort, contribute to the intensive care medicine training programme. An important suggestion for further improvement is to more prominently tailor the intensive care training to the competencies of each individual trainee. However, this result was anticipated. After all, the basic level of knowledge and skills when enrolling in the intensive care training programme is diverse, whereas the required end-of-training competencies are identical. In contemporary practice the duration of training as well as curricular content and assessment structure seem poorly equipped to accommodate such a request. It is, however, acknowledged that these structures are now subject to change, into the direction of so-called individualised educational programmes. Within several postgraduate training programmes, including intensive care medicine training in the Netherlands, so called Entrustable Professional Activities (EPAs) are now developed.^[20,21] These instruments provide insight into the level of supervision required for each individual trainee during each training phase, finally allowing them to execute a certain task unsupervised. When this is the case for all the defined EPAs defined, the intensive care medicine trainee could be certified and thus, at least in theory, this results in an flexible duration of the training programme tailored to each individual's needs. Although EPAs are undoubtedly a useful addition to the armamentarium currently used in intensive care medicine training, the question nevertheless remains whether the current curriculum supplemented with EPAs can fully account for all relevant differences in competency development, arising from for example the differences in primary specialty. For example, is it possible for an anaesthesiologist to become competent regarding diagnosis and treatment of the complex haematological patient in the intensive care unit during the two-year programme? Likewise one may wonder whether every internist reaches the top of the learning curve regarding technical skills such as intubation in the same time frame. The results of this and prior research indeed suggest the necessity of national adaptations in training, teaching and (formative and summative) assessment programmes, with local fine tuning. If the structure of the recently revised intensive care medicine curriculum fails to provide sufficient possibilities to successfully complete flexible individualised training and learning programmes tailored to each trainee's needs, a debate regarding extension of the contemporary programme duration or striving for the primary specialty status may be initiated. Apart from these long-term initiatives and suggestions, possibilities to improve the training programme on a relatively short term are also suggested. Notwithstanding the emphasis on workplace-based learning with direct supervision, the need for more feedback on both clinical reasoning and skills is unabated.

From prior research it is well known that a large proportion of trainees' clinical tasks remains unobserved and feedback is likewise too infrequently provided.^[22,23] This is perhaps remediable by filling out mini-clinical examination (mini-CEX) forms for observation of the clinical trainees' tasks for which the clinical supervisors have the mandatory final responsibility, such as the correction and editing of discharge letters, bad news conversations with patients and relatives, supervision of the multidisciplinary patient discussions, and staff consultations by trainees while on call regarding ICU admission requests. In addition, the fellows voice a need for more formal educational sessions. The MCTQ+ narrative feedback mainly pertains to learning during bedside teaching and simulation sessions in the local training centres, not to the national educational sessions. Such requests to shift the focus of the formal educational sessions from a national to a local level have been noted previously.^[19,20] Another suggestion is to put more emphasis on knowledge assessment, especially pertaining to commonly encountered disease entities. For this purpose a number of generally applicable e- (electronic) and i- (interactive) learning instruments are available. Finally, the trainees remarked that several clinical teachers' basic educational knowledge and skills necessary for state-of-the art clinical teaching could be improved. Examples were the provision of positive and negative feedback. These remarks strongly support the implementation of faculty development programmes, such as the Dutch 'Basic qualification in medical education' (BKO).

Limitations of the study

The response rate is relatively low. Furthermore, selection bias with more favourable answers by more motivated trainees cannot be ruled out. The instruments used are primarily validated in the context of postgraduate training. However, in the current intensive care medicine training model, some of the participants were residents in their primary specialty, whereas others had already finalised their primary specialty programme. In addition, the response rate necessitated aggregation of scores on items across factors. This approach results in a general judgment on the educational team as a whole, whereas MCTQ+ primarily aims at providing feedback on individual clinical teachers. This also hampered analysis of the correlations between results on the D-RECT and the MCTQ+ per centre. Furthermore, the TeamQ questionnaire, which measures the quality of teamwork in teaching teams in postgraduate medical training,^[24] was not available when the study was performed. Finally, the perspective of the clinical teachers on the results was not studied.

Conclusions

The implementation of a quality assurance and improvement framework for the Dutch postgraduate training programmes is necessary, and will soon become compulsory. Measurement

and evaluation of the educational climate, and the functioning of the clinical teachers is part of such a framework. The results of this preliminary national study give the general impression of a good quality of the training programmes in intensive care medicine in the Netherlands, with a limited number of areas of attention per training centre. The trainees' narrative comments give direction to further possible improvements in the training programme, most of which suggest a more prominent role for the local training centres.

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