Time spent on documenting quality indicator data and associations between the perceived burden of documenting these data and joy in work among professionals in intensive care units in the Netherlands: a multicentre cross-sectional survey

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ABSTRACT

Objectives The number of indicators used to monitor and improve the quality of care is debatable and may influence professionals’ joy in work. We aimed to assess intensive care unit (ICU) professionals’ perceived burden of documenting quality indicator data and its association with joy in work.

Design Cross-sectional survey.

Setting ICUs of eight hospitals in the Netherlands.

Participants Health professionals (ie, medical specialists, residents and nurses) working in the ICU.

Measurements The survey included reported time spent on documenting quality indicator data and validated measures for documentation burden (ie, such documentation being unreasonable and unnecessary) and elements of joy in work (ie, intrinsic and extrinsic motivation, autonomy, relatedness and competence).

Multivariable regression analysis was performed for each element of joy in work as a separate outcome.

Results In total, 448 ICU professionals responded to the survey (65% response rate). The overall median time spent on documenting quality data per working day is 60 min (IQR 30–90). Nurses spend more time documenting these data than physicians (medians of 60 min vs 35 min, p<0.01). Most professionals (n=259, 66%) often perceive such documentation tasks as unnecessary and a minority (n=71, 18%) perceive them as unreasonable. No associations between documentation burden and measures of joy in work were found, except for the negative association between unnecessary documentations and sense of autonomy (β=−0.11, 95% CI −0.21 to −0.01, p=0.03).

Conclusions Dutch ICU professionals spend substantial time on documenting quality indicator data they often regard as unnecessary. Despite the lacking necessity, documentation burden had limited impact on joy in work. Future research should focus on which aspects of work are affected by documentation burden and whether diminishing the burden improves joy in work.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- We used validated scales to estimate outcome measures regarding documentation burden and joy in work, and then subjected these measures to multivariable analysis.

- The high response rate and the large sample of respondents from eight different hospitals allowed us to provide a complete and robust picture of the situation in different types of intensive care units (ICUs) in the Netherlands.

- Findings are based on data from Dutch ICU professionals and may not be representative of ICU professionals in other countries.

- Response bias, which is commonly associated with self-assessment scales, may have occurred.

INTRODUCTION

Like in many other healthcare settings, quality indicators are used in intensive care units (ICUs) as standards to measure, compare and improve quality of care. Like in many other healthcare settings, quality indicators are used in intensive care units (ICUs) as standards to measure, compare and improve quality of care. The collection of information and reporting on these indicators is meant to inform various stakeholders (ie, patients, healthcare professionals, health insurers, regulators) about structural and procedural aspects of care and related patient outcomes and experiences. Quality indicator data are assumed to improve the quality of care by providing feedback and enabling healthcare providers to compare and benchmark their performance. Fuelled by the benefits of quality measurement, the growing accountability of hospitals towards different stakeholders, and the growing public interest
in healthcare quality, there is an increasing demand for hospitals to deliver performance data to be held accountable for.5,7

Parallel to this trend, stakeholders have started to raise concerns about the often excessive number of quality indicators healthcare professionals are faced with as it diverts time from real quality improvement and actual patient care.8–11 Not only the number of quality indicators, but also their efficacy is under debate. There is a little evidence that the considerable effort and resources invested in documenting quality data improve health outcomes.5,12–14 Lack of validity of indicators, reliability issues, poor data quality or lack of support by clinicians may be the underlying reasons.15–18 The multitude of required documentations on measures that often are not proven effective and valid may diminish their joy in work.19 Above all, administrative tasks are the leading cause of burnout and turnover among healthcare professionals.20,21

Despite these concerns, the burden of documenting quality indicator data as perceived by ICU professionals is hardly studied while this group, like other healthcare providers, have to deal with many administrative tasks apart from providing actual patient care.8 Furthermore, this documentation burden may take its toll on the morale and motivation of ICU professionals that are already negatively impacted by a long period of hardworking during the COVID-19 pandemic. Therefore, we aimed to assess ICU professional’s perceived burden due to documenting data for quality monitoring and improvement and its association with joy in work. Furthermore, this study serves as a baseline measurement for an intervention study evaluating the impact of working with a reduced set of ICU care quality indicators on documentation burden and joy in work that currently runs in the ICUs of eight hospitals in the Netherlands.

METHODS
Study design, setting and population
A cross-sectional survey was conducted between May and June 2021 in the ICUs of one academic, five teaching and two non-teaching hospitals in the eastern part of the Netherlands. This study is a multi-centre follow-up to a previous study performed between 2017 and 2018.8 Overlap can be found in the content of the survey and the analysis of data. Participating ICUs were mixed medical-surgical ICUs providing intensive care for (treating) adult critically ill surgical, medical or trauma patients. Study participants were ICU healthcare professionals who document quality information and are involved in direct medical or nursing care. This study is reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology guideline and using the Consensus-Based Checklist for Reporting of Survey Studies.

Data collection
All eligible ICU professionals at the participating institutions were sent an invitation by email to participate in the survey, containing a personalised link to an online questionnaire. Two reminders were sent after the initial invitation, the first after 14 days and the second after 28 days. The questionnaire was built in the web-based system Castor Electronic Data Capture, and tested on the usability and technical functionality prior to data collection. Informed consent was obtained as a first question. Data were immediately stored digitally in Castor EDC, Amsterdam, the Netherlands.

The survey started with eight general questions, including age, gender, profession, professional tenure, working hours per week and dedicated hours for patient care per shift. Questions about documentation burden were then introduced by providing the respondents with a definition of a quality indicator and examples of quality indicators in the ICU for which professionals document data (eg, pain scores and the incidence of delirium, pressure ulcers and sepsis). Then, the ICU professionals were asked how many minutes they spend on documenting quality indicator data on a typical working day (documenting time), and their attitudes towards documenting such data, using the Bern Illegitimate Tasks Scale.22,23 This scale contains four statements measuring the perceptions of documenting such data as being unnecessary (eg, ‘How often do you document quality indicator data where you believe that this is going too far, and should not be expected of you?’). Responses were given on a 5-point Likert scale, ranging from 1=never to 5=often.22,25 We measured the consequences of documenting these data on the professionals’ joy in work in terms of their work motivation and sense of autonomy, competence, and relatedness. Work motivation refers to intrinsic motivation (being motivated because the job is fun, enjoyable or in line with one’s values),24 which was measured using six items from the Multidimensional Work Motivation Scale (eg, ‘I exert effort for my job because I risk losing my job if I do not put enough effort in’). Responses were given on a 7-point Likert scale, ranging from 1=not at all, to 7=totally.25 Experienced autonomy (ie, sense of volition, eg, ‘I feel free to do things my own way’), relatedness (ie, meaningful relationships, eg, ‘I care about the people I spend time with’) and competence (sense of being capable, eg, ‘I feel competent to achieve my goals’) were each measured using three items from the Basic Psychological Needs Scale.26 Answers were rated on a 5-point Likert scale, ranging from 1=totally disagree to 5=strongly agree.
5=totally agree. The reliability of the different scales was determined using Cronbach’s alpha and was considered acceptable for all measures except for the 3-item scale for competence (α=0.60). This scale’s reliability improved after removing one item (α=0.67), and the analyses are based on the resulting 2-item scale.

**Data analysis**

Data were analysed using SPSS V.25. Descriptive statistics were used to summarise the respondent’s characteristics. Frequency, percentage, mean, SD, median and IQR scores were used according to the data type. The variables ‘minutes spent on documenting quality indicator data per day’ and ‘hours of direct patient care per day’ had a skewed distribution, and therefore the non-parametric Mann-Whitney U test was applied. Normally distributed variables were analysed using the independent t-test. Subgroup analyses were carried out for physicians (ie, medical specialists and residents) and nurses (ie, ICU nurses, nurse practitioners and nurse students).

We analysed missing values and removed cases with missing values on one of the documentation burden or joy in work variables (listwise analysis). Bivariate correlations between variables were assessed using Spearman’s rho and Pearson’s correlations according to the data type. Univariate regression analyses were used to assess the association between each type of documentation burden as independent predictors with each element of joy in work (ie, intrinsic and extrinsic motivation, autonomy, relatedness and competence). This was followed by multivariable regression analyses including both types of perceived documentation burden and controlling for professional tenure, hours of direct patient care per day, working hours per week, type of profession (dichotomised into physicians and nurses) and ICU setting. Age was not included in the regression analyses because this variable highly correlated with professional tenure (r=0.87, p<0.01). Documentation time was not included in the regression analyses because this variable did not correlate with any of the joy of work elements. A regression-based moderation analysis was performed to identify whether the relationship between documentation burden and joy in work is different for physicians and nurses. Therefore, two interaction terms were added to the multivariable regression models: that is, unreason-able documentation*type of profession and unneces-sary documentation*type of profession. Because of the hierarchical structure, with professionals nested within eight ICUs, fixed-effect dummies for ICUs were included in all the multivariable analyses to account for this cluster effect. A p value of <0.05 was considered to be statistically significant, based on two-sided tests.

**Patient and public involvement**

There were no patients or members of the public involved in the design or conduct of this study.

**RESULTS**

**Study participants**

The survey was sent to 694 ICU professionals of whom 448 replied, resulting in a response rate of 65%. Response rates across the participating ICUs varied between 50% and 85% (online supplemental file 1). Twenty-five respondents were excluded from the analysis because they did not fill in any answer or only answered the demographic questions (n=21), or were not involved in direct patient care and did not document quality information (n=4). An additional 29 respondents were left out of the regression analysis because of missings for the variables on documentation burden or joy in work. A test of differences between the excluded respondents with demographic data and included respondents showed that the excluded respondents were younger (Mexc=38.6 years vs Minc=43.8 years, p<0.01) and had less working experience (Mexc=10.8 years vs Minc=19.1 years, p<0.01). No statistically significant difference was found in gender (p=0.06) and the number of working hours per week (p=0.47).

**Table 1** presents characteristics of the respondents. Most of the respondents worked as a nurse (including students and nurse practitioners; 82.8%) compared with those who worked as a medical specialist or resident (17.2%). Overall, this distribution represents the ratio of nurses versus physicians working in the different participating ICU settings (online supplemental file 2). On average, respondents were experienced ICU professionals working 33 hours per week in the ICU.

**Documentation burden and joy in work**

**Table 2** shows median and mean scores on documentation time, perceived documentation burden, and elements of joy in work. The overall median time spent on documenting quality indicator data by physicians and nurses is 60 min per working day (IQR 30–90). Nurses spent significantly more minutes per day documenting than
physicians, with a median of 60 min (IQR 30–93) versus 35 min (IQR 20–60), respectively (p<0.01). A minority (n=71, 18%) of the healthcare professionals reported that they often document quality data which they perceived as unreasonable, while two-thirds of the respondents (n=259, 66%) often documented data on what they considered to be unnecessary quality indicators (online supplemental file 3). No differences were found between physicians and nurses in their perception of unnecessary (p=0.21) and unreasonable (p=0.32) documentations.

Physicians, as a group, scored higher on all joy in work outcomes compared with nurses. Although group differences were statistically significant for extrinsic motivation (p=0.01), and sense of autonomy (p<0.01) and relatedness in work (p=0.01), the absolute difference in means for all joy in work outcomes is relatively small (table 2).

Correlations between documentation time and burden and elements of joy in work
Table 3 shows that no statistically significant correlations were found between the time spent documenting quality indicator data per working day and any measure of joy in work. A weak correlation was found between

Table 3 Correlations between registration burden and healthcare professionals’ joy in work (n=394)

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<td>1. Time documenting quality indicator data (min/day)</td>
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<td>2. Unreasonable documentation†</td>
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<td>3. Unnecessary documentation†</td>
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<td>4. Intrinsic motivation‡</td>
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<td>5. Extrinsic motivation‡</td>
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<td>6. Autonomy‡</td>
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<td>7. Relatedness‡</td>
<td>0.07 0.02 –0.03 0.36** 0.09 0.39**</td>
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<td>8. Competence‡</td>
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<td>9. Professional tenure (years)§</td>
<td>0.03 0.10 0.04 –0.16** –0.14* 0.16* –0.08 –0.09</td>
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<td>10. Patient care (hours/day)§</td>
<td>–0.08 –0.08 –0.01 0.02 –0.10 0.14* 0.03 0.04 0.03</td>
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<td>11. Working hours per week</td>
<td>–0.10* &lt;0.01 –0.09 0.12* 0.09 0.14* 0.09 0.08 –0.39* 0.03</td>
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<td>12. Age</td>
<td>–0.18* 0.11* –0.06 –0.13** –0.15** 0.14* –0.07 –0.03 –0.18* 0.05 –0.15*</td>
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1–3: documentation burden; 4–8: joy in work; 9–11: control variables. Spearman’s rho (r_s) is given for 1, 9 and 10, Pearson’s correlation is given for 2–8 and 11–12. Statistically significant (*p<0.05 (two-tailed); **p<0.01 (two-tailed)) results are presented in bold.
documentation time and both unreasonable ($r_s=0.25$, $p<0.01$) and unnecessary documentations ($r_s=0.18$, $p<0.01$). A moderate correlation was found between documenting unreasonable and unnecessary indicator data ($r=0.56$, $p<0.01$). Both unreasonable and unnecessary documentations correlated negatively with autonomy ($r=−0.13$, $p=0.01$), indicating that professionals with a sense of being autonomous in their job are more likely to perceive the documentation of quality data as unreasonable or unnecessary than their colleagues who feel less autonomous.

### Associations between types of documentation burden and elements of joy in work

Unreasonable and unnecessary documentation were negatively associated with ICU professional’s sense of autonomy, as seen in the univariate models in table 4 and online supplemental file 4. No univariate associations between both types of documentation burden and other elements of joy in work were found. After controlling for other variables, only unnecessary documentation was negatively associated with sense of autonomy ($β=−0.11$, 95% CI $−0.21$ to $−0.01$, $p=0.03$). This association was not moderated by the type of profession (being a nurse or physician). The variance in professionals’ autonomy explained by perceived unnecessary documentation, and other measured covariables was low with 15% (table 4).

### DISCUSSION

This survey shows that ICU professionals in the Netherlands spend substantial time on documenting quality indicator data. Such documentation tasks are especially time-consuming for ICU nurses who are responsible for most of these documentations compared with ICU physicians. Furthermore, two-thirds of the respondents consider such tasks often as unreasonable, particularly those documentations of which professionals thought other should do it. Our findings also show that the burden of documenting quality data seems to have limited impact on ICU professionals’ joy in work.

The median reported time of 60 min per day spent on documentation corresponds with findings of previous studies involving Dutch ICU professionals, and can be explained by a large number of ICU quality indicators.
that ‘ticking boxes’ diminishes physicians’ and nurses’ reasoning.8 Moreover, valuable documentation time may come at the expense of direct patient care,10 11 and the quality of care and the documentation themselves.6 Therefore, it is justified to question which quality indicators in the ICU contribute to better and safer patient care. The above-mentioned considerations regarding the added value of quality indicators might also explain the ICU professionals’ perceptions of documenting quality data observed in our study. A qualitative study in the Netherlands showed that health professionals perceive documentation tasks as unnecessary because they were not relevant for clinical practice or used for quality improvement, overlapped or contradicted with other documentation, or replaced clinical considerations with other documentation, or replaced clinical reasoning.9 Moreover, valuable documentation time could have been reduced if the documentation process had been organised more efficiently. Nurses in the UK previously reported similar frustrations and explanations for this type of burden.30 An explanation for documentation perceived as unreasonable can be found in the fact that most of the documentation of data in Dutch ICUs are for purposes other than direct quality improvement in clinical practice (eg, accountability, accreditation and payment),9 and therefore are not seen as a part of their professional core tasks.

Contrary to previous literature,8 31 32 our study also shows that documentation burden seems to have limited impact on ICU professionals’ joy in work, based on the measures we applied. No associations were found between perceived documentation burden and measures of joy in work, except for unnecessary documentations being associated with a lower sense of autonomy. Documenting information that ICU physicians and nurses perceive as unnecessary conflicts with their basic need for professional autonomy, that is, being able to act volitionally and in line with one’s values and professional knowledge base,24 25 and is in line with previous studies indicating that ‘ticking boxes’ diminishes physicians’ and nurses’ sense of autonomy and clinical reasoning.8 20 33 Because professional autonomy is key to delivering good quality of care, especially in acute care settings,16 19 34 35 these unnecessary tasks may threaten the quality of ICU care. The lack of further associations between either documentation time and unreasonable documentation tasks and joy in work could be explained by possible differences among professionals in the extent to which they are affected by documentation burden.8 Some professionals may become frustrated and demotivated, whereas others do not let themselves be affected by these tasks, for example, because they are internally rationalised, skip the documentation of certain data, or find other coping mechanisms. In addition, organisational culture and team climate may reinforce or protect ICU professionals from experiencing the negative consequences of documentation burden.36–38 Another explanation might be that the perceptions of documentation moderate the relationship between documentation time and joy in work.8 Devoting time to documenting useful quality information could align with ICU professionals’ values, and therefore not reduce, but possibly even increase their intrinsic motivation (ie, doing enjoyable things that are in line with one’s values). Finally, this survey was performed amid the COVID-19 pandemic. The impact of the pandemic on ICU professionals’ work and mental well-being is significant,39–41 and most likely influenced their joy in work. This might be a reason for the low variance in measures of joy in work explained by the registration burden. On the other hand, the high response rate during a pandemic might underline the perceived importance of the studied subject.

Strengths and limitations

To our knowledge, this is the first empirical multicentre study examining ICU professionals’ burden of documenting quality indicator data. Compared with other studies,42 especially web-based surveys,43 this study had a high response rate of 65%. Our sample seems sufficiently large and the inclusion of ICUs across eight hospitals provides a more complete picture of the situation in different types of ICUs in the Netherlands. Of the respondents, 83% were nurses and 17% were physicians representing the nurse–physician ratio in our ICUs. Furthermore, we used validated scales in the questionnaire to estimate outcome measures and then subjected these measures to multivariable analysis. Previous validation of these instruments strengthens the evidence that most ICU professionals often deal with documenting quality data they often perceive as unnecessary and that a relation exists between unnecessary documentation and a reduced sense of autonomy.

Several limitations of the study should, however, be noted. First, our findings may not be representative of other countries. Although the documentation burden seems to affect healthcare professionals around the globe, the demand for quality data and documentation efficiency differs per country.44 Compared with most other high-income countries, health professionals in the Netherlands face more paperwork and other bureaucratic tasks.44 Second, there may be a possibility that our findings are biased due to a selective group that did not respond to our survey. We did not use specific methods to address this issue, except for comparing excluded with included cases on demographics. Third, response bias, which is commonly associated with self-assessment scales,45 may have occurred. Respondents tend to overestimate themselves when filling out these scales. This could mean that the results provided an overestimation, for example, on motivation levels. Moreover, documentation time was based on a self-reported estimation using a single-item measure. This may have led to less accurate estimations. The impact of the COVID-19 pandemic on the work and the mental health of ICU professionals,39–41 could also have influenced the scoring by respondents, for example, to emphasise...
that the documentation of quality data is time-consuming and takes away valuable time from providing necessary care to the large volume of COVID-19 patients. However, outcome scores on documentation burden and joy in work seen within our sample are similar to the levels observed in other samples of health professionals, supporting our belief in our sample’s representativeness. Finally, ratings may be partly based on perceptions on the documentation of information for routine clinical care instead of monitoring and improvement purposes. We provided a definition and examples of quality indicators in the questionnaire to address this issue.

IMPLICATIONS

Our study calls for a critical review of the number of quality indicators in ICUs. Since this is the first multicentre study on the burden of documenting quality indicator data in the ICU, more research on this topic is needed in different countries to examine the representativeness of our findings and to gather more empirical evidence on the relationship between ICU professionals’ documentation burden and joy in work. Future studies should focus on which aspects of work are affected by this type of burden (after carefully defining these concepts and selecting appropriate measures) and whether diminishing the burden improves joy in work. A combination of quantitative and qualitative research methods is preferred to gain a broad overview of burden types and insight into the underlying factors impacting the joy in work.

Nevertheless, more focus on documenting only what matters is needed. This could be achieved by formulating a core set of measurable quality indicators with for each indicator a clear operationalisation. The selection and use of these indicators should be built on the consensus of all stakeholders who have information demands (ie, policy-makers, regulators, funders, boards, healthcare professionals and patients). In this process, they must align their information needs to avoid unnecessary overlap.

Documentation burden in the ICU may also be reduced by organisational adjustments to facilitate efficient data collection and documentation (eg, use of intelligent information technology and administrative staff). Also by replacing bureaucratic controls with a policy based on trust in the ICU professional who takes responsibility for the quality of care. The above-mentioned strategies have been recently implemented in the ICUs of the eight participating hospitals. The effects of this intervention bundle on ICU professionals’ documentation burden and joy in work will be evaluated in a longitudinal study.

CONCLUSION

Dutch ICU professionals spend substantial time on documenting quality indicator data they often regard as unnecessary. Although more research on this topic is needed in different countries to examine the representativeness of our findings and to gather more empirical evidence on the relationship between ICU professionals’ documentation burden and joy in work, it is evident that the use of quality indicators in the ICU is a topic that needs further improvement. Documenting only what matters in a core set of quality indicators, reducing inefficiencies in the process of collecting and documenting data, and giving ICU professionals more responsibility for quality improvement along with adequate organisational means, are vital in tackling the adverse effects of documentation burden.

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Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval This study involves human participants and local ethics committee ‘CMO region Arnhem-Nijmegen’ approved the study (registration number: 2021-9156). Participants informed consent was obtained at the start of the questionnaire. Participation was only possible after reading the informed consent and selecting the ‘agree’ option; otherwise, the questionnaire could not be filled out. Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer-reviewed.

Data availability statement The deidentified dataset of the current study is available from the corresponding author on reasonable request.

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