





# The effectiveness of the Ethics Quarter intervention on the ethical activity profile of nurse managers: A randomized controlled trial

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## Abstract

**Aim:** To test the effectiveness of a new ethics educational e-learning intervention, Ethics Quarter, in supporting nurse managers' ethical activity profile.

**Background:** Health care organisations need evidence-based ethics interventions to support nurse managers' ethical activity profile.

**Methods:** A parallel-group, individually randomized controlled trial was conducted in 2020. Finnish nurse managers nationwide [members of the Union of Health and Social Care Professionals in Finland (Tehy) trade union] were randomly allocated to intervention ( $n = 169$ ) or control group ( $n = 172$ ). The intervention group participated in the Ethics Quarter comprising twelve 15-min evidence-based educational 'quarters' spread over 6 weeks. The control group had standard organisational ethics structures. The primary and secondary outcomes were ethical activity profile and ethics knowledge, respectively. The Consolidated Standards of Reporting Trials (CONSORT) statement for study design and reporting was adopted.

**Results:** Ethical activity profile showed statistically significant differences in mean changes between the groups from baseline to 10 weeks: all five dimensions were statistically significantly higher in the intervention group compared with the control group ( $p = <.0001$ ).

**Conclusion:** The Ethics Quarter was effective in increasing nurse managers' ethical activity profile.

**Implications for Nursing Management:** Applying this ethics educational e-learning intervention would benefit nursing management education and health care organisations.

**Trial Registration:** clinicaltrials.gov: NCT04234503.

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## KEYWORDS

education, distance, ethics, internet-based intervention, nurse administrators, nursing

## 1 | INTRODUCTION

Nurse managers are responsible for the realization of the health care value base and for performing various ethical activities. In this study, these ethical activities, based on previous literature, have been theoretically outlined, and using deductive reasoning, summarized into a new construct defined as the ethical activity profile of nurse managers consisting of five dimensions: (1) developing one's own ethics knowledge, (2) influencing ethical issues, (3) conducting or implementing ethics research, (4) identifying and (5) solving ethical problems (Laukkanen, Leino-Kilpi, & Suhonen, 2016; Laukkanen, Suhonen, & Leino-Kilpi, 2016, Data S1). All dimensions of the profile require different kinds of ethical activities from nurse managers, are equally important, and can be summarized. To have a high ethical activity profile, nurse managers have to perform activities from all dimensions.

Nurse managers themselves have found ethical activities to be central in their work (Kantaneen et al., 2017; Makaroff et al., 2014), albeit challenging, and they would like more guidance on how to perform ethical activities (Devik et al., 2020; Schick-Makaroff & Storch, 2019). It is also known that nurse managers lack support on ethics issues from their superiors and organisations (Makaroff et al., 2014), even though the need for ethics support is evident in all health care (Tallis et al., 2015) and organisations play an important role in strengthening nurse managers' ethical sensitivity and decision-making (Roshanzadeh et al., 2020). To support nurse managers to have a high ethical activity profile, there is a globally recognized, urgent need to create and test ethics interventions for the use of health care organisations (Aitamaa et al., 2021; Barkhordari-Sharifabad et al., 2018a; Devik et al., 2020; Markey et al., 2020; Poikkeus et al., 2020; Roshanzadeh et al., 2020). However, it is not known what kind of ethics intervention would be effective in supporting the ethical activity profile of nurse managers.

## 2 | BACKGROUND

In the current era, ethical activities of nurse managers receive increasing international attention in health care administration (Keselman & Saxe-Braithwaite, 2020; Markey et al., 2020). Nurse managers' ethical activities seem to have a positive impact on health care personnel in terms of higher work engagement (Zappalà & Toscano, 2020) and job satisfaction (Barkhordari-Sharifabad et al., 2018b; Zappalà & Toscano, 2020). Ethical activities of nurse managers also have positive impacts on patient outcomes, bringing higher patient satisfaction (Barkhordari-Sharifabad et al., 2018b; Wong et al., 2013) and quality of care (Barkhordari-Sharifabad et al., 2018b; Shirey, 2005; Zaghini et al., 2020). Ethical activities of managers also benefit organisational performance in terms of overall organisational success (Shirey, 2005).

However, based on earlier studies, the ethical activity profile of nurse managers is partly low. Only a limited number of managers develop their own ethics knowledge (Aitamaa et al., 2021; Laukkanen, Leino-Kilpi, & Suhonen, 2016), influence ethical issues or conduct or implement ethics research (Laukkanen, Leino-Kilpi, & Suhonen, 2016). Nevertheless, nurse managers identify many work-related ethical problems (Aitamaa et al., 2021) and engage in a variety of activities to solve these problems (Aitamaa et al., 2019; Laukkanen, Suhonen, & Leino-Kilpi, 2016). Thus, we can assume nurse managers to be sensitive to ethics issues, and offering them support should strengthen their ethical activity profiles in the future.

There are few earlier ethics intervention studies (Stolt et al., 2018) searching for ways to support nurse managers in the field of health care and nursing ethics (Eide et al., 2016; Storch et al., 2013), and almost nothing involving online courses or e-learning. Recently, however, there have been some promising results concerning the possibilities of these interventions, also involving ethics (Edmonson, 2015; Eide et al., 2016; Jeon et al., 2018). In this study, we aim to strengthen the ethics intervention area. A new ethics educational e-learning intervention, the Ethics Quarter, developed by researchers for research purposes at the University of Turku to support the ethical activity profile of nurse managers, was tested for the first time in this study in clinical environment using a randomized controlled trial. The detailed research questions and hypothesis of this study were as follows: Is the Ethics Quarter effective in increasing (1) the development of nurse managers' own ethics knowledge, (2) nurse managers' influence on ethical issues, (3) the conduct or implementation of ethics research by nurse managers, (4) the identification of ethical problems by nurse managers and (5) nurse managers' ability to solve ethical problems. It is hypothesized that participating in the Ethics Quarter intervention supports nurse managers' ethical activity profile (in all five dimensions) compared with control group.

## 3 | METHODS

### 3.1 | Design

The study design involved a parallel-group, individually randomized controlled trial with two arms: intervention group (for the Ethics Quarter) and control group (with a standard organisational ethics structure, meaning that the participants' organisation may have had clinical ethics committees such as ethical advisory committees and other working groups discussing ethical issues, excluding research ethics committees), with baseline (=M0, before intervention), post intervention (=M1, after the intervention, Week 6) and follow-up (M = 2, 4 weeks after the intervention) measurements.

Based on a statistical power analysis, it was estimated that a sample size of 87 nurse managers per group ( $n = 174$  in total) would be needed to provide the study with 80% power at a significance level of 0.05 (two-tailed, SD 0.7). Managers were randomly allocated to intervention or control group after baseline measurement, with the support of a randomization table drawn up by a statistician. Randomization was performed using random permuted blocks, with a block size of 8, using the SAS System for Windows (Version 9.4). The results of the randomization were imported into the Research Electronic Data Capture (REDCap) software platform (Harris et al., 2019) where randomization for each subject was executed by a researcher. Major imbalances between the groups were prevented in the design stage by using stratified randomization (Lamb & Altman, 2015). Two nurse manager background factors, participating in continuing ethics education and having standard organisational ethics structure (Aitamaa, 2020; Sietsema & Spradley, 1987), were known to correlate with one dimension of the ethical activity profile (identifying ethical problems). Thus, to achieve equal representativeness, participants were stratified into intervention and control groups according to these background factors measured at the baseline.

The inclusion criteria for the participants were that they should (1) be working as nurse managers and (2) have sufficient command of the Finnish language.

The study was registered on the ClinicalTrials.gov website with the identifier: NCT04234503. The Consolidated Standards of Reporting Trials (CONSORT) statement for study design and reporting was adopted (Schulz et al., 2010).

### 3.2 | Recruitment of the participants

Participants were recruited, with permission from the Union of Health and Social Care Professionals in Finland (Tehy) (<https://www.tehy.fi/en>), from January to September 2020 in Finland. The Tehy trade union is a national professional interest group for registered nurses, nurse managers and advanced consultants/specialists in the social and health care sector. The recruitment was stopped when there were  $n = 341$  participants as the sample size was estimated to be large enough, also considering possible drop-outs. Finally, 211 participants completed the study: 97 participants in the intervention and 114 in the control group (Figure 1). The loss of follow-up in the intervention group was 42.6% ( $n = 72$ ). However, the nurse managers who signed in ( $n = 119$ ) had very strong commitment to the Ethics Quarter, and 80.7% ( $n = 96$ ) completed the intervention. The sample loss in the control group was 33.7% ( $n = 58$ ).

### 3.3 | Intervention and control groups

The intervention group participants had support provided by their possible standard organisational ethics structures. Furthermore, they participated in the Ethics Quarter intervention consisting of 12 educational quarters in a virtual learning environment. The

'quarters' were evidence-based text slides, including real-life role model experiences on each presented issue. Using role models may be one way to explicitly bring learning about ethical leadership to a wider group of managers in the organisation (Brown & Treviño, 2006). In the intervention, the participants completed two educational quarters ( $2 \times 15$  min), exploring one dimension of the ethical activity profile per week. The structure of the overall intervention was based on the five dimensions of nurse managers' ethical activity profile, also including orientation and summary quarters. After each presented dimension, the participants made self-reflection and development plans (Data S2). The control group did not participate in the Ethics Quarter. They had support provided only by their possible standard organisational ethics structures.

### 3.4 | Data collection

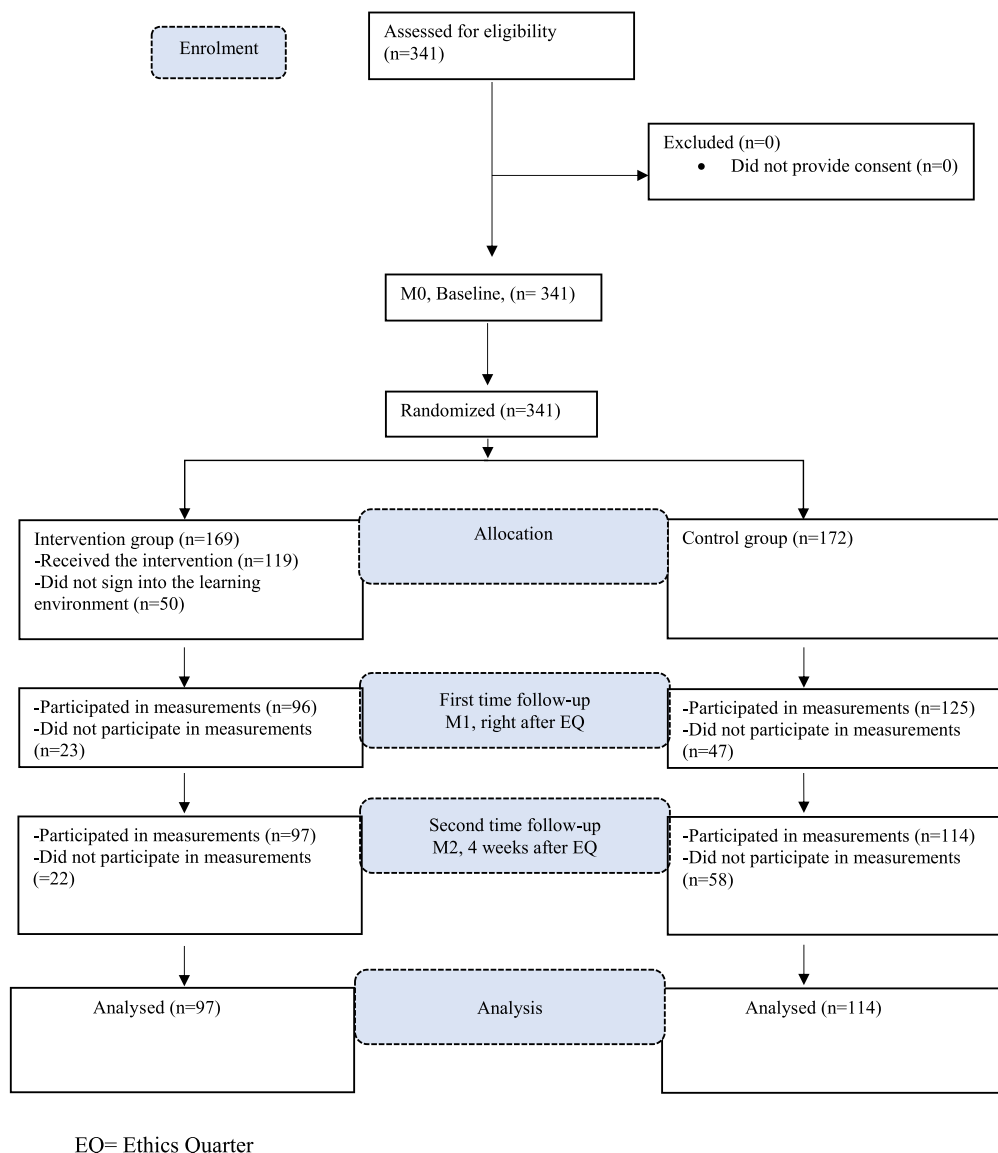
Nurse managers received the Tehy trade union management information letter with an ad of the study including a short description of the study intervention and a web-link to the website: <https://etiikanvartti.fi/?tutkimus>. The website contained complete information about the study, and if a manager wanted to take part in the study, s/he gave informed consent, and all filled in all the study measurements. The data were collected and managed using the REDCap tools hosted at the University of Turku (Harris et al., 2019). After randomization, information about the study group and user rights concerning the Ethics Quarter virtual learning environment for the intervention group participants were e-mailed via REDCap.

### 3.5 | Outcome measures

The primary outcome was nurse managers' ethical activity profile level assessed in two ways:

- The ethical activity profile level was assessed using the Ethical Activity-Instrument (EAI) (developed by LL, RS & HL-K, 2019). Higher scores indicate a higher self-assessed ethical activity profile level.
- Dimensions 1–3 of the ethical activity profile level were assessed using the Developing, Influencing and Implementing Ethics Instrument (DIIEI, developed by LL, RS & HL-K, 2019), dimension 4 was assessed using the Ethical Sensitivity Scale Questionnaire (ESSQ, Tirri & Nokelainen, 2011) and dimension 5 using the Nurses' Moral Courage Scale (NMCS, Numminen et al., 2019). All the instruments were 5-point Likert scales (1 = *totally disagree*; 5 = *totally agree*/1 = *Does not describe me at all*; 5 = *Describes me very well*), with higher scores indicating higher self-assessed ethical activity level.

The secondary outcome was the level of ethics knowledge assessed with the Nursing Management Ethics Knowledge-Test (NMEKT, developed by LL, RS & HL-K, 2019). Higher scores indicate higher level of ethics knowledge. Furthermore, background factors



**FIGURE 1** Nurse manager participant CONSORT flowchart through the study. EQ, Ethics Quarter

were inquired. The outcomes and psychometric properties of the instruments are reported in Table 1.

### 3.6 | Data analysis

The data analysis was performed using SAS software, Version 9.4 of the SAS System for Windows (SAS Institute Inc., Cary, NC, USA). A significance level of .05 (two-tailed) was used. Categorical variables were summarized with counts and percentages, whereas continuous variables were summarized with the median and range.

The analysis followed the intention-to-treat principle (as randomized). The baseline demographic characteristics were compared between the intervention group and control group using a chi-square test or Fisher's exact test (if needed) for categorical variables and the Mann-Whitney *U* test for continuous variables if normality assumption was not met.

The total ethical activity profile and dimensions were analysed using a linear mixed model where time was handled as within factor and group as between factor in the statistical model. Additionally, the group-by-time interaction was included in the model to examine whether the mean change over time was different between the intervention groups. A computed symmetry covariance structure was used for repeated measures. The data included some missing values, but they were assumed to be completely random. Model-based means as well as 95% confidence intervals (CI) are shown.

### 3.7 | Ethical considerations

Responsible Conduct of Research [ALL European Academies (ALLEA), 2017] was followed in all study phases. The study protocol was approved by the Ethics Committee of the University of Turku (Decision number 4/20) and by the (Tehy) trade union 1/2020.

**TABLE 1** Outcomes and psychometric properties of instruments

Study outcomes	Measurements	Number of items and scores	Psychometric properties	
			Cronbach's alpha	Validities
<b>Primary outcomes</b>				
The ethical activity profile level	Ethical Activity-Instrument (EAI, LL, RS & HL-K 2019), a visual analogue scale measuring all five dimensions of ethical activity	5 items (score: 0–100), ↑ scores ↑ ethical activity profile	$\alpha = 0.86$	S-CVI clarity 0.92. S-CVI relevance 1.
The ethical activity profile level dimensions 1–3	Developing, Influencing and Implementing Ethics Instrument (DIIEI, LL, RS & HL-K, 2019), a 5-point Likert-scale (1 = <i>never</i> ; 5 = <i>very much</i> )	12 items (4 developing knowledge, 4 influencing ethics issues and 4 implementing ethics research), ↑ scores ↑ ethical activity	$\alpha = 0.88$	S-CVI clarity 0.94. S-CVI relevance 0.99.
The ethical activity profile level dimension 4, ethical sensitivity	Ethical Sensitivity Scale Questionnaire (ESSQ, Tirri & Nokelainen, 2011), a 5-point Likert-scale (1 = <i>totally disagree</i> ; 5 = <i>totally agree</i> )	16 items, ↑ scores ↑ ethical sensitivity	$\alpha = 0.85$	The ESSQ is used earlier with teachers and students, but operates on a general level and can be used in all contexts (Kuusisto et al., 2012).
The ethical activity profile level dimension 5, moral courage	Nurses' Moral Courage Scale (NMCS, ©Numminen et al., 2019), a 5-point Likert-scale (1 = <i>Does not describe me at all</i> ; 5 = <i>Describes me very well</i> )	21 items, ↑ scores ↑ moral courage	$\alpha = 0.93$	The NMCS has been validated with nurses. Nine items were further developed for this study to accurately measure the moral courage of nurse managers. S-CVI clarity 0.98. S-CVI relevance 0.98.
<b>Secondary outcome</b>				
Ethics knowledge level	Nursing Management Ethics Knowledge-Test (NMEKT, LL, RS & HL-K, 2019), a self-reporting instrument to test nurse managers' knowledge of the terms and principles of ethics	10 items, [yes/no, correct responses score 1 point and incorrect responses 0 (zero), summative score range 0–10], ↑ scores ↑ ethics knowledge		S-CVI clarity 0.93. S-CVI relevance 0.99.

The nurse managers received written information about the purpose and practical implementation of the study. The participating nurse managers gave their informed consent.

## 4 | RESULTS

### 4.1 | Demographic characteristics of the sample

A total of  $n = 341$  participants were included in the study, of whom  $n = 169$  were randomly allocated to the intervention group and  $n = 172$  to the control group (Figure 1). There were no statistically significant differences (all  $p > .005$ ) in the demographic characteristics between the groups (Table 2).

### 4.2 | Ethical activity profile

The ethical activity profile showed statistically significant differences in the mean changes between the groups from baseline to 10 weeks. The overall ethical activity profile showed an improvement of 8.12 (95% CI = 6.17–10.06,  $p < .001$ ) measured with the EAI, for dimensions 1–3, there was an improvement of 0.30 (95% CI = 0.22–0.37,  $p < .001$ ) measured with the DIIEI; for dimension 4, an improvement of 0.18 (95% CI = 0.12–0.24,  $p < .001$ ) measured with the ESSQ; and for dimension 5, an improvement of 0.18 (95% CI = 0.11–0.23,  $p < .001$ ) measured with the NMCS in the intervention group, whereas the control group showed no statistically significant changes. The results are shown in Table 3 and Figure 2.

**TABLE 2** The demographic characteristics of the nurse managers at the baseline (N = 335–341)

Variables	Total, N = 335–341 n (%)	IG, N = 142–144 n (%)	CG, N = 145–147 n (%)	p value
Age				.731
Years, median (range)	50 (26–64)	50 (28–64)	49 (26–64)	
<40	63 (18.5)	32 (18.9)	31 (18.1)	
40–49	104 (30.6)	49 (29.0)	55 (32.1)	
50–59	146 (43.0)	72 (42.6)	74 (43.3)	
≥60	27 (7.9)	16 (9.5)	11 (6.4)	
Gender				.593
Female	324 (95.9)	158 (95.2)	166 (96.5)	
Male	14 (4.1)	8 (4.8)	6 (3.5)	
Highest education				.139
Registered nurse's (or corresponding) degree	152 (44.5)	80 (47.3)	72 (41.9)	
Master's degree (university of applied sciences)	99 (29.0)	53 (31.4)	46 (26.7)	
Master's degree (university)	72 (21.1)	27 (16.0)	45 (26.2)	
Licentiate degree/doctoral degree (university)	1 (0.3)	1 (0.6)	0 (0)	
Other	17 (5.0)	8 (4.7)	9 (5.2)	
Employment sector				.791
Public	246 (72.2)	124 (73.4)	122 (70.9)	
Private	90 (26.3)	43 (25.4)	47 (27.3)	
Trust	5 (1.5)	2 (1.2)	3 (1.8)	
Position in organisation				.961
Unit-level management	245 (84.5)	120 (83.9)	125 (85.0)	
Middle management	37 (12.7)	19 (13.3)	18 (12.3)	
Strategic management	8 (2.7)	4 (2.8)	4 (2.7)	
Length of work experience				1.000
Years, median (range)	8 (0–37)	8 (0–37)	8 (0–32)	
<5	105 (31.0)	53 (31.4)	52 (30.6)	
5–10	109 (32.1)	54 (31.9)	55 (32.3)	
>10	1125 (36.9)	62 (36.7)	63 (37.1)	
Number of subordinates				.376
Number, median (range)	26 (0–5000)	28 (0–5000)	25 (0–400)	
<21	120 (35.8)	56 (33.1)	64 (38.6)	
21–50	161 (48.1)	84 (49.7)	77 (46.4)	
51–100	38 (11.3)	18 (10.7)	20 (12.0)	
>100	16 (4.8)	11 (6.5)	5 (3.0)	
Participation in continuing ethical education				.775
Yes	59 (17.3)	28 (16.6)	31 (18.0)	
No	282 (82.7)	141 (83.4)	141 (82)	
Participation in an ethics working group/committee				.853
Yes	32 (9.4)	15 (8.9)	17 (9.9)	
No	307 (90.6)	153 (91.1)	154 (90.1)	
Having an official ethics-related post				.389
Yes	23 (6.8)	9 (5.4)	14 (8.1)	
No	317 (93.2)	159 (94.6)	158 (91.9)	
Participating in an ethics research project				.248

(Continues)

TABLE 2 (Continued)

Variables	Total, N = 335–341 n (%)	IG, N = 142–144 n (%)	CG, N = 145–147 n (%)	p value
Yes	3 (1.0)	0 (0)	3 (1.0)	
No	286 (98.9)	142 (49.1)	144 (49.8)	
Participating in an ethics development project				1.000
Yes	10 (3.0)	5 (3.0)	5 (2.9)	
No	328 (97.0)	163 (97.0)	165 (97.1)	
Having an ethics organisational structure				1.000
Yes	91 (26.7)	45 (26.6)	46 (26.7)	
No	250 (73.3)	124 (73.4)	126 (73.3)	

Note: p values are calculated between the total IG and CC. Categorical variables tested with Fisher's exact test, continuous with Mann–Whitney U test. Abbreviations: CG, control group; IG, intervention group; SD, standard deviation.

### 4.3 | Ethics knowledge

The level of ethics knowledge was already high in both groups at baseline. The intervention group baseline mean score according to the NMEKT was 9.30, (95% CI = 9.20–9.41), and the control group baseline mean was 9.34 (95% CI = 9.24–9.44).

## 5 | DISCUSSION

The Ethics Quarter educational e-learning intervention succeeded in strengthening the participating nurse managers' ethical activity profile in all its dimensions. The 6-week Ethics Quarter was statistically significantly effective in increasing the participating nurse managers' ethical activity profile in terms of developing their own ethics knowledge, influencing ethical issues, conducting or implementing ethics research, and identifying and solving ethical problems. At the beginning of the study, the intervention and control group did not differ in terms of background (Table 2), but both right after the intervention and at the follow-up measurement, the intervention group had a statistically significantly higher ethical activity profile. The increase was valid for all five dimensions of the activity profile.

Our findings show that the Ethics Quarter is an effective intervention for supporting nurse managers in their ethical activities. Even though clinical ethics support (such as clinical ethics committees) has become widespread in Europe (Magelssen et al., 2016) and it is known that clinical ethics committees can establish a supportive network and provide ethical leadership (Ong et al., 2020), it seems that clinical ethics support is not enough for nurse managers regarding their more challenging ethical activities. Moreover, managers have indicated that health care organisations provide suboptimal levels of support (Poikkeus et al., 2020). Additionally, in this study, the organisational ethics structures available to the participants (referring to different kinds of clinical ethics committees) were weak. Most of the participants reported that there were no organisational ethics structures (73%). Thus, organisations globally would benefit from taking the Ethics

Quarter into use as an ethics structure for nurse managers: it offers systematic, evidence-based education, as well as guidance on how to carry out ethical activities, and it increases the level of ethics knowledge. Even though the participants scored well in this study on the knowledge level already before the implementation of the intervention and the NMEKT was not able to show increased ethics knowledge in either group, the participants evaluated their ethics knowledge to be increased in the feasibility evaluation of the study. The participants were asked whether the Ethics Quarter learning intervention increased their ethics knowledge, and their views were measured using a 5-point Likert-scale (1 = *totally disagree*; 5 = *totally agree*). They rated the intervention highly, awarding a score of 4.59 (Laukkanen et al., 2021, unpublished results) in answer to this question.

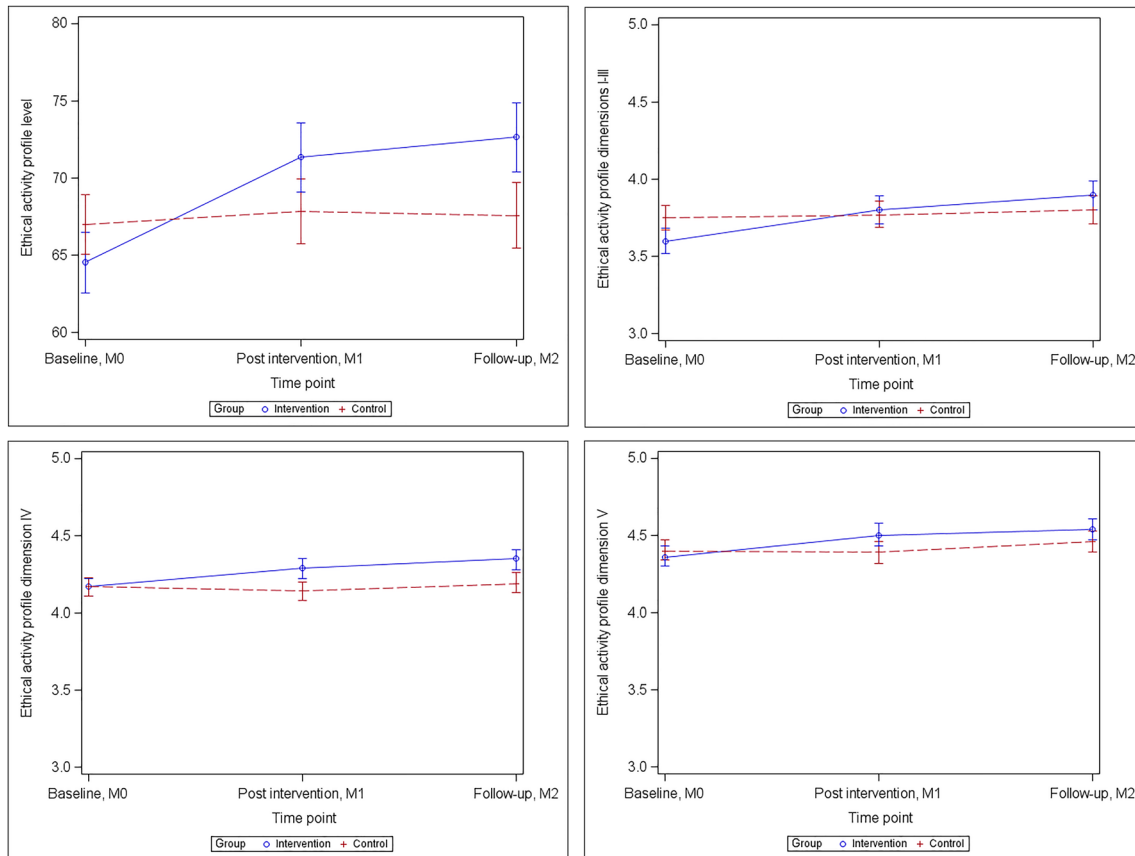
The effectiveness of the Ethics Quarter might result from several advantages. It provided new continuing educational possibilities to the participants. Participation was easy as the participants only needed access to the Internet. The time needed was moderate, and participation was free of charge, and there were no costs for the organisation (despite the nurse managers' participation time). This intervention was tailored for research and clinical support purposes, not for business purposes. The Ethics Quarter consisted of only 12 quarters, each lasting only 15 min. Additionally, the e-learning education was felt to be feasible and usable (Laukkanen et al., 2021, unpublished results) according to the participants. The contents of the Ethics Quarter were evidence-based and written in everyday language using real-life case examples with engaging stories (Brown & Treviño, 2006) in every dimension to highlight the ethical activities of nurse managers. Self-reflection and development plans might also provide participants with an easy opportunity to link their everyday experience to the new ethical theory they have just studied. A multimethod intervention allowing combining theory and practice (Cannaerts et al., 2014) seemed to be an effective way of learning for the participants. To develop the learning outcomes of Ethics Quarter even further, interactivity and feedback could be a promising amendment (Cook et al., 2010).

The findings of this study comply with previous studies, (Barkhordari-Sharifabad et al., 2018a; Devik et al., 2020;

TABLE 3 Main outcomes, improvements in ethical activity profile and dimensions in IG and CG with different instruments

Scale and dimension	Intervention group			Control group			Change in outcomes		
	Baseline, M0, mean, 95% CI, n = 156-169	After intervention, M1, mean, 95% CI, n = 96	Follow-up, 10 weeks after intervention, M2, mean, 95% CI, n = 95-97	Baseline, M0, mean, 95% CI, n = 157-172	After intervention, M1, mean, 95% CI, n = 116-125	Follow-up, 10 weeks after intervention, M2, mean, 95% CI, n = 106-114	Group by time interaction, p	Baseline- after intervention M1, p	Baseline- follow-up 10 weeks after intervention, M2, p
Ethical activity profile level, Ethical Activity-Instrument (EA)	64.53 62.59-66.47	71.34 69.07-73.61	72.65 70.39-74.91	66.99 65.05-68.93	67.85 65.76-69.95	67.59 65.45-69.73	<.001	<.001	<.001
Developing one's own ethics knowledge, dimension 1	60.79 58.30-63.28	70.31 67.30-73.32	71.36 68.37-74.35	63.84 61.35-66.34	62.83 60.09-65.58	63.79 60.96-66.61	<.001	<.001	<.001
Influencing ethical issues, dimension 2	67.29 64.90-69.67	73.70 70.85-76.55	75.82 72.99-78.66	68.50 66.12-70.88	69.17 66.58-71.76	67.65 64.98-70.32	<.001	.002	<.0001
Conducting or implementing ethics research, dimension 3	52.80 50.01-55.59	59.45 56.05-62.85	60.87 57.47-64.27	56.70 53.86-59.54	58.84 55.76-61.91	57.70 54.50-60.89	.0082	.005	.003
Identifying ethical problems, dimension 4	74.82 72.71-76.93	79.16 76.57-81.75	80.16 77.62-82.75	75.47 73.36-77.57	77.17 74.83-79.50	76.38 73.98-78.79	.038	.130	.012
Solving ethical problems, dimension 5	67.42 65.08-69.75	75.20 72.38-78.01	76.31 73.52-79.10	68.97 66.64-71.30	71.29 68.72-73.85	71.95 69.33-74.57	.001	.003	.001
The ethical activity profile dimensions									
Developing Influencing and Implementing Ethics instrument (DIEI), dimensions 1-3	3.60 3.52-3.68	3.80 3.71-3.89	3.90 3.80-3.99	3.75 3.67-3.83	3.77 3.69-3.86	3.80 3.71-3.89	<.001	.001	<.001
Ethical Sensitivity Scale	4.17 4.11-4.22	4.29 4.22-4.35	4.35 4.28-4.41	4.17 4.11-4.23	4.14 4.08-4.20	4.19 4.13-4.26	<.001	.003	.001
Questionnaire (ESSQ), dimension 4									
Nurses' Moral Courage Scale (NMCS), dimension 5	4.36 4.30-4.43	4.50 4.43-4.58	4.54 4.47-4.61	4.40 4.34-4.47	4.39 4.32-4.46	4.46 4.39-4.53	.001	.003	.004





**FIGURE 2** Model-based means and 95% confidence intervals (CI) at the baseline, after intervention and at the follow-up

Markey et al., 2020; Poikkeus et al., 2020; Roshanzadeh et al., 2020) and indicate the need for ethics education for nurse managers. Surprisingly, nearly half of the participants (44.6%) in this study had only a registered nurse (or corresponding) degree, in other words, a baccalaureate (bachelor) degree. American Organisation of Nurse Executive (AONE) (2010) suggests that nurse managers should have at least a bachelor's or master's degree. However, earlier studies have concluded that a bachelor's degree is not sufficient for the role of a nurse manager (Shirey et al., 2010) and at least some management training is needed (McCallin & Frankson, 2010; Ramseur et al., 2018). In this study, the participants also had a low level of continuing education in ethics. Only 17% had participated in continuing ethics education, even though 69% had five or more years of work experience. This finding is even lower than in earlier study results; Aitamaa et al. (2021) found that 28% of managers, and Laukkanen, Leino-Kilpi, and Suhonen (2016) found that 48% of nurse managers had participated in continuing ethics education. Based on these background factors, the respondents' development of their own ethics knowledge seemed to be alarmingly low. Nurse managers should develop their ethics competence throughout their careers (Stievano et al., 2012) to be ethically skilled (Eide et al., 2016; Stievano et al., 2012) and to have the most up-to-date knowledge (Ravaghi et al., 2020).

In this study, most of the participants were working in unit-level management, where of all the management levels, nurse managers

seem to encounter the most ethical problems (Aitamaa et al., 2021). In unit-level management, managers are responsible for running a unit and have the most direct contacts with patients. Thus, unit-level managers might have more patient-related ethical problems to solve than other management levels (Aitamaa et al., 2016), and acknowledging this, it is essential to support unit-level management. Nevertheless, it must be noticed that the expectations of ethical activities seem to increase with authority and responsibility; for example, the higher one is in the hierarchy, the higher the expected use of moral courage to do the right thing in the organisation (Edmonson, 2015). Thus, it is important to ensure that senior managers in middle and strategic level management are also educated to exhibit high levels of ethical behavior (Schaubroeck et al., 2012). Thus, directing the Ethics Quarter towards upper management and chief nursing first would help to disseminate the effects of the intervention to wider levels within the organisation.

## 5.1 | Limitations

There is a lack of validated instruments for the measurement of abstract ethics issues in the nursing management context. Thus, we had to develop three new instruments and used only two validated ones. Operationalizing the ethics concept was demanding, and expert

panel expertise was used to strengthen the development. However, the content validity (S-CVI) and furthermore, internal consistency (Cronbach's alpha) of these new instruments were estimated to be good (Table 1). To ensure the construct validity and reliability of the instruments, the data were collected from a large and appropriately representative sample of the target population. However, the instruments used were mostly self-evaluation instruments, and the participants might have wanted to demonstrate a higher ethical activity profile than they actually have. Thus, the study aimed to avoid any possible social desirability response bias by using anonymous participation, as well as mostly forced choice items and computer administration (Randall & Fernandes, 1991). The generalizability of the results for the nurse manager population is reasonable, although it is possible that the data included managers who were already interested in ethics issues while less interested managers did not participate. Furthermore, the COVID-19 pandemic may have increased the need for ethical activities of nurse managers during data collection, and it may also have disrupted existing organisational ethics structures. For unknown reason, 50 participants received the password to the learning area, but never signed in. The COVID-19 pandemic may have had a negative effect on nurse managers' ability to participate. However, those who signed in had a high level of commitment. Participation caused reasonable burden. Future research may consider evaluating the effect of adapting the Ethics Quarter intervention to all management levels in one organisation to get an idea of how a high ethical activity profile could be spread to all management levels in one organisation. In any case, wider implementations and constant development of the intervention are necessary to strengthen this intervention even further.

## 6 | CONCLUSION

This randomized controlled trial demonstrated that a 6-week e-learning educational ethics intervention, the Ethics Quarter, proved to be effective in supporting nurse managers' ethical activity profile and its related dimensions. However, further cumulative evidence is needed.

### 6.1 | Implications for nursing management

Nurse managers at all management levels in educational and health care organisations are encouraged to apply the Ethics Quarter intervention to support their ethical activity profile. Ethics Quarter can be used as organisational ethics structure and continuing ethics education possibility for nurse managers.

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#### CONFLICT OF INTEREST

None declared.

#### ETHICS STATEMENT

The Ethics Committee of the University of Turku (Decision number 4/20) and the Tehy trade union 1/2020.

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#### DATA AVAILABILITY STATEMENT

Due to the sensitive nature of the questions asked in this study, survey respondents were assured raw data would remain confidential and would not be shared, hence, data are not available as it is confidential.

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## SUPPORTING INFORMATION

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