

**The orientations and attitudes of intermediate vocational trained nursing students (MBO-V) toward their future profession and its relation to students' characteristics: A descriptive pretest-posttest survey**

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Course: Master Thesis  
Version: Final  
Date: 30-05-2016  
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Research institution: Wenckebach Instituut, University Medical Center Groningen  
Reference style: Vancouver  
Transparent reporting: STROBE Statement: STrengthening the Reporting of OBServational studies in Epidemiology  
Intended journal: Nurse Education Today  
Number of words: English abstract: 295  
Dutch abstract: 293  
Content: 3797

## ABSTRACT

**Background:** Students' orientations and attitudes toward nursing influence the decision to enter the nursing profession, but also influence attrition rates due to unmet expectations experienced during education. To counteract the expected nursing shortages, it is important to explore students' orientation and attitudes in favor of recruitment and retention before and during education. The orientation and attitudes of vocational trained nursing (MBO-V) students are unknown, however this is the largest group of nursing students in the Netherlands.

**Research question:** What are the orientations and attitudes of MBO-V students toward their future profession before and after five months of nursing education? Secondary, which demographic characteristics are related and influence positive orientations and attitudes?

**Method:** A descriptive pretest-posttest survey was conducted among first-year MBO-V students at nine regional training centers in the Netherlands. Students completed a questionnaire before and after five months of education consisting of: nursing orientation tool, nursing attitude questionnaire, and demographic characteristics such as gender, age, living status, first-choice programme, and career choice. The Wilcoxon paired-rank test was conducted to determine changes over time. The Mann-Whitney *U*-test was performed to compare group scores. Regression analysis was used to determine which demographic characteristics influence students' orientation and attitudes.

**Results:** At the beginning of nursing education, MBO-V students (N=454) agreed most with statements related to caring, nursing expertise, advocacy, empathy, and developing/applying knowledge. After five months, students were more life-oriented, while caring, nursing expertise, advocacy, and empathy decreased. Selecting nursing as a first-choice program and aiming for a nursing career influenced students' orientation and attitudes toward nursing.

**Conclusion/Recommendations:** Beginning MBO-V students hold positive views toward nursing, which alter during the first five months of nursing education. Being aware of students' orientations and attitudes toward nursing can help nurse educators in recruitment and retention strategies.

**Keywords:** nursing students, orientation, attitude, survey.

## INTRODUCTION

Decreased recruitment and retention of nursing students is currently contributing to the expected nursing shortages worldwide.<sup>1</sup> In the Netherlands, shortages of more than 450,000 people working in healthcare are expected in 2020, most of whom are registered nurses.<sup>2</sup> Increasing the attractiveness of nursing education and working in health care is needed to counteract future shortages.<sup>3-5</sup> Dutch nursing education involves two levels: level five bachelor trained nurses (HBO-V) and level four vocational trained nurses (MBO-V). Nowadays, both levels are registered nurses covering the same nursing profile. However, the increasing demand for and decreasing supply of care has led to a recent revision of the competencies and responsibilities of the two levels.<sup>5-7</sup> The ability to differentiate nursing levels is expected to contribute to the increasing demand and complexity of care and to address the expected nursing shortages.<sup>7,8</sup> This implies that future HBO-V and MBO-V nurses have a different role in nursing health care than present nurses; the complexity of care will determine the level of nursing.<sup>5</sup> Exploring nursing students' career choices and expectations about nursing is needed to involve their perspective about their future roles in the nursing work field and, thereby, enhance future recruitment and retention.

The way students orient toward their future professions is an important aspect of career choice. Orientation is defined as "a person's basic beliefs or feelings in relation to a particular subject or issue."<sup>9</sup> Ryan et al. (2002) have stated that one's orientation is of paramount importance as it is related to attitudes that ultimately lead to action.<sup>10</sup> This suggests that orientation and attitude predominantly characterize someone's career choice. Attitude toward nursing is theoretically defined as "the view that persons hold regarding the roles, values, and professional activities of nurses, and the responsibilities nurses have toward society."<sup>11</sup>

The decision to choose nursing as a career is often based on personal reasons and life situation, and includes a willingness to care for others<sup>12-15</sup>, interest in health<sup>12,13</sup>, professional development<sup>13-15</sup>, employability<sup>12,14,15</sup>, and family life situation<sup>15,16</sup>. Beginning students are mostly care-oriented and view nursing as an occupation where the focus is on benevolence, e.g. being compassionate, taking care of others, and making a difference in people's lives, instead of on developing knowledge and skills.<sup>12,15-17</sup> Furthermore, beginning students' perception of nursing roles is often based on superficial knowledge.<sup>12,15</sup> The factors mentioned reveal students' orientation and attitudes (OAs) toward nursing, and it could be argued that beginning students have a more idealistic than realistic view of nursing. Previous findings have proven that students' OAs are influenced by interactions with nursing before their education<sup>18</sup>, but are also influenced through nursing education itself<sup>19</sup>. Especially idealistic views change during nursing education, resulting in incongruent expectations.<sup>18,20</sup> These mismatched views eventually contribute to higher attrition rates.<sup>21,22</sup> In contrast, demographic characteristics such as gender, preliminary education, previous

nursing/caring experiences, nursing as a first-choice program, and nursing career ambition have been to found influence more positive OAs toward nursing among bachelor students.<sup>14</sup>

A recently published study investigated the OAs among HBO-V students in the Netherlands.<sup>14</sup> However, over 60% of nursing students in the Netherlands undergo MBO-V education<sup>23</sup> and their OAs are unknown. Because of the changing roles and competencies in nursing, a current study is needed to explore if MBO-V students' OAs are realistic and meet these changes. Unrealistic views before education could contribute to reduced recruitment. Moreover, experiencing unmet expectations during education might increase attrition rates. Therefore, it is important to also explore MBO-V students' OAs before and during education and possible demographic characteristics that influence career choice. This could help nurse educators to address expectations and guide future recruitment and retention strategies for this group of students.

## **RESEARCH QUESTION(S)**

### *Main-question*

What are the orientations and attitudes of level four intermediate vocational trained nursing students (MBO-V) toward their future profession in the first year of their four-year education and does this change after five months of nursing education?

### *Sub-questions*

- (1) Which demographic characteristics are related to students' orientation and attitudes at the beginning of nursing education?
- (2) Which demographic characteristics influence positive orientation and attitudes?

## METHODS

### *Study design*

A descriptive pretest-posttest survey was conducted between September 2015 and February 2016. The survey provided the ability to collect OAs from a large sample in a short period of time.<sup>24</sup> The study program was seen as manipulator that might influence students' OAs, therefore a pretest-posttest was chosen.

### *Participant selection and sample*

The study population consisted of level four MBO-V students starting in the first year of their full-time four-year education program at regional training centers (ROCs) in the Netherlands. A consecutive sample was applied, because students were recruited on the basis of the ROC's and the students' availability and willingness to participate. Students were excluded if they had already undergone MBO-V education before the pretest, as this could have affected their responses.

The Dutch MBO-council indicated a maximum population of 6,723 MBO-V students per year. A sample size calculation with a power of 80% and a significance level of  $p < .05$  resulted in a sample size of at least 363 students. With a range of 25-80 students per location, 10 ROCs in the north and central region of the Netherlands were approached.

### *Instruments*

Students completed a three-part questionnaire consisting of the Nursing Orientation Tool (NOT)<sup>15</sup>, the reduced version of the Nursing Attitude Questionnaire (NAQ)<sup>14</sup>, and demographic characteristics. The NOT and the reduced NAQ were used because these instruments provided the data being sought. A forwards-backwards translation was performed for both questionnaires to assure that the questionnaires were conceptually equivalent and applicable in the Dutch context.<sup>14</sup>

The NOT questionnaire was developed by Vanhanen et al. (1999) and consists of 17 items using a five-point Likert scale. The NOT measures students' orientation toward nursing using three subscales: caring (six items), nursing expertise (six items), and life orientation (five items). The caring orientation reflects students' meaningful experiences with caring/nursing. The nursing expertise orientation reflects students' meaningful experiences of being a nursing professional. The life orientation is based on the balance between study and family life situation.

The intercorrelations among the items were reasonable with a cronbach's alpha of .79 for the whole NOT and for the subscales: caring  $\alpha = .71$ , nursing expertise  $\alpha = .67$ , and life orientation  $\alpha = .74$ .<sup>25,26</sup> The other measurement properties of the NOT can be found in appendix 1.

The reduced NAQ is an 18-item five-point Likert questionnaire measuring attitudes toward nursing, which was originally developed by Toth et al. (1998).<sup>11</sup> The reduced NAQ consists of two

subscales: nursing agency (14 items) and advocacy and empathy (four items). Nursing agency involves the interrelation between acquiring nursing knowledge and its use in nursing practice.<sup>27</sup> Advocacy and empathy corresponds to the way nurses speak out and stand up for patients' needs.<sup>28</sup> The intercorrelations among the items were reasonable with a cronbach's alpha of .79 for the whole NAQ and for the subscales: nursing agency  $\alpha=.74$  and advocacy and empathy  $\alpha=.63$ .<sup>14</sup> The other measurement properties of the NAQ can be found in appendix 1.

Based on the content and measurement properties, we considered that both questionnaires were suitable for analysis.

Demographic characteristics consisted of: gender; age, living status, preliminary education, nursing as a first-choice program, nursing/caring experiences, nursing career ambition, (previous) problems with study program, and students' consideration of withdrawal after five months.

### *Data collection*

The questionnaires were distributed and collected by the researchers (YtH and CvdB) or by nursing teachers during a scheduled lesson in September 2015 (pretest) and in January/February 2016 (posttest). The ascribed student-numbers were collected to match the results of the pretest and posttest.

### *Data analysis*

The total percentage of missing values in the dataset was 0.4% and <1.3% per variable. To test if the missing data were missing completely at random (MCAR), which means that the missing data are just a random subset of the data<sup>29</sup>, the Little's MCAR test was performed and confirmed this assumption ( $p\text{-value} > .05$ ). No imputation techniques were performed as any handling missing data techniques give similar results when missing data is  $\leq 5\%$  in a random pattern and the MCAR assumption is assumed.<sup>29</sup> Therefore, available-case analysis (pairwise deletion) was performed. Individual questionnaires with >10% of missing values were excluded from analyses, as this may bias the results.<sup>30</sup>

Descriptive statistics using amounts and percentages for categorical/ordinal variables and means with standard deviation for continuous variables were used to express students' demographic characteristics and the results of the NOT and NAQ. The following continuous and categorical variables were dichotomized for further analysis because of the homogeneous study population: age:  $\leq 17$ ,  $\geq 18$ ; living status: with parent(s), independently; and preliminary education: vocational, non-vocational. All tests were performed using IBM SPSS version 21.

Using the Kolmogorov Smirnov test, we assessed the normality of the data of the whole NOT and NAQ and of each subscale. The data was found positively skewed. Therefore, we performed

non-parametric tests using the median scores and interquartile ranges, which is recommended with skewed data.<sup>31</sup>

The Wilcoxon paired-rank test was conducted to test whether students' OAs changed over time. This test was performed on the data of the whole NOT and NAQ and of each subscale, consecutively. If the OAs significantly changed ( $p$ -value  $<.05$ ), the Wilcoxon paired-rank test was performed to determine which individual items of the NOT and NAQ significantly differed between the pretest and posttest.

The Mann-Whitney  $U$ -test was performed to analyze comparisons between groups for the dependent variable, NOT, NAQ, and each subscale. Categories for group analysis were: gender, age ( $\leq 17/\geq 18$ ), living status (with parents/independently), preliminary education (vocational/non-vocational), nursing as a first-choice program (yes/no), nursing/caring experiences (yes/no), and nursing career ambition (yes/no). In addition, univariate linear regression analyses were used to test which of these demographic characteristics significantly ( $p$ -value  $<.05$ ) influence positive OAs. When there were two or more independent variables that influence positive OAs, a multivariate regression analysis using the backward stepwise selection was performed. For the regression analyses, the whole NOT and NAQ and each subscale were separately used as a dependent variable.

A minimum of 10 cases for every independent variable in the regression analysis is recommended.<sup>32</sup> With seven possible influencing characteristics, at least 70 cases were needed to perform a regression. The assumptions of linearity, normality, homoscedasticity, and multicollinearity of the regression analyses were checked to ensure no violations.

### *Ethical approval*

Because first year MBO-V students are mostly under-aged (16-17 years old), ethical approval was granted by the deans and faculty boards of the ROC's. The ROCs determined that informed consent from parents was not required, because the questionnaires were short and did not ask sensitive questions. Their policy is that equivalent questionnaires are used as part of the career counselling lesson.

Students were orally informed about the purpose of the study and that participation is voluntary. Students were assured that the data would be treated confidentially and anonymously. Students gave consent by completing the questionnaires.

## RESULTS

Nine ROCs gave permission for this study. One ROC did not want to participate, because its first-year students had already participated in a study. 457 students completed the pretest and 422 students the posttest, which was 89.1% and 82.3% respectively of the overall included students (N=513). Of these students, 362 completed both the pretest and posttest. Three students at the pretest and two at the posttest had more than 10% missing values based on the NOT and NAQ questionnaires and were excluded from the analysis.

### *Demographic characteristics*

The largest group were females (>86%). Students' ages ranged between 15 and 30 years old. At the posttest, 5.1% (n=23) of students had withdrawn from the study program and another 10.5% (n=44) had considered withdrawal. All students' characteristics are presented in Table 1.

Insert Table 1.

### *Orientation toward nursing*

Nursing expertise was the most dominant orientation in this group of students, and they agreed most with items that reflected career opportunities and derived professional competencies. Students were also positively oriented to caring and agreed most with items that reflected the inner drive to take care of others. Students agreed less with the life orientation scale. The overall scores are presented in Table 2.

The Wilcoxon paired-rank test demonstrated that there was no significant change in the overall orientation toward nursing ( $z=-1.70$ ,  $p=.089$ ). On the subscales, however, most students reported a less positive orientation toward caring ( $z=-3.57$ ,  $p=.000$ ) and nursing expertise ( $z=-3.16$ ,  $p=.002$ ), and a higher life orientation ( $z=-2.98$ ,  $p=.003$ ) (Figure 1). Differences in scores on individual items revealed that after five months of education, students (N=362) scored significantly lower on items within the caring orientation that reflected their intrinsic motivation to become a nurse and within the expertise scale on items that reflected personal and professional development. Regarding life orientation, students agreed most with the item related to the balance of studying nursing and being with family. The significantly changed items are shown in Table 2.

Insert Table 2.

Insert Figure 1.



### *Related and influencing factors of positive orientation toward nursing*

The Mann-Whitney *U*-test revealed that those who had nursing as a first-choice program and those who had a nursing career ambition had a significantly more positive score on the whole NOT questionnaire and were more positive toward the caring orientation than students who did not have nursing as their first-choice program and/or desired another career (Table 3). Other demographic characteristics were not significantly related to students' orientation toward nursing or the subscales.

Univariate linear regression analyses showed that only choosing nursing as a first-choice program and having a nursing career ambition influenced the overall orientation toward nursing and the orientation toward caring. Therefore, both variables were entered in the multivariate regressions using the backward stepwise selection. First, a multivariate regression showed that choosing nursing as a first-choice program ( $\beta=.10$ ,  $p=.045$ ) and having a nursing career ambition ( $\beta=.12$ ,  $p=.011$ ) influenced a more positive overall orientation toward nursing ( $F_{(2, 440)}=5.74$ ,  $p=.003$ ,  $R^2=.03$ ,  $R^2_{\text{Adjusted}}=.02$ ). Second, a multivariate linear regression showed that choosing nursing as a first-choice program ( $\beta=.17$ ,  $p=.000$ ) and having a nursing career ambition ( $\beta=.10$ ,  $p=.026$ ) influenced a more positive orientation toward caring ( $F_{(2, 440)}=10.10$ ,  $p=.000$ ,  $R^2=.04$ ,  $R^2_{\text{Adjusted}}=.04$ ).

Insert Table 3.

### *Attitude toward nursing*

Students agreed most with the items on the advocacy and empathy scale and were positive regarding the fact that nurses are patients advocates and value time at the bedside. Regarding nursing agency, this group of students saw nursing as an independent practice that is as important as the service given by physicians, but also that nurses improve patient care by contributing to the development of policies and the use of evidence-based practice. The overall scores are presented in Table 4.

The Wilcoxon paired-rank test demonstrated that the overall attitude toward nursing did not significantly differ between the pretest and posttest ( $z=-1.76$ ,  $p=.079$ ). With respect to the subscales, the Wilcoxon paired-rank test revealed that students were significantly less positive regarding advocacy and empathy ( $z=-3.16$ ,  $p=.002$ ), while nursing agency did not reveal a significant change after five months of education ( $z=-.85$ ,  $p=.398$ ) (Figure 2). Differences in scores on individual items revealed that after five months of education students ( $N=362$ ) were significantly less positive about the fact that nurses are kind and compassionate and value time at the bedside taking care of patients. The significantly changed items are shown in Table 4.

Insert Table 4.

Insert Figure 2.

*Related and influencing factors of positive attitude toward nursing*

The Mann-Whitney *U*-test demonstrated that students who did not have nursing as their first-choice program were significantly more positive to nursing agency than students who had nursing as their first-choice program (Table 5). Other demographic characteristics were not significantly related to students' attitude toward nursing or the subscales.

Univariate linear regression analyses showed that only choosing nursing as a first-choice program influenced the attitude toward nursing agency. These results show that those who did not have nursing as a first-choice program ( $\beta = -.12$ ,  $p = .009$ ) influenced a more positive attitude toward nursing agency ( $F_{(1, 451)} = 6.90$ , 95% CI [-.182, -.026],  $p = .009$ ,  $R^2 = .02$ ,  $R^2_{\text{Adjusted}} = .01$ ).

Insert Table 5.

## DISCUSSION

This study aimed to identify the OAs of MBO-V students at the start and after five months of education. The relationship between OAs and students' demographic characteristics were also examined. The results show that beginning MBO-V students are positive toward nursing expertise, caring, advocacy and empathy, and nursing agency. However, OAs change during the first five months of education, both positively and negatively. Further, having nursing as a first-choice program and aiming for a career in nursing influence a more positive orientation to nursing and toward caring. Selecting nursing as first-choice program was found to influence a less positive attitude toward nursing agency.

In summary, this study shows that the need to take care of others, working at the bedside, having career opportunities, and improving patientcare by contributing to the development of policies and the use of evidence-based practice are important items for beginning MBO-V students. They also agree that nursing is as important as the work of physicians. These results are similar to other studies that investigated OAs among bachelor students.<sup>14,16,19,20</sup> However, the finding that beginning MBO-V students are mostly oriented to nursing expertise is inconsistent with the results described in previous studies, which found that beginning bachelor students are more life-oriented toward nursing.<sup>16,19,20</sup> however, these studies also revealed that nursing expertise becomes more dominant throughout nursing education. This indicates that beginning MBO-V students are well prepared for the acquired professional competencies in nursing. In the Netherlands, most MBO-V students take a "health and welfare" course during their preliminary vocational training at the secondary level, with the purpose of preparing themselves to work in social services or health care. This denotes the importance of students' previous education in influencing their career choices.

Of concern is the changing OAs of MBO-V students found in this study, which already occurred after five months of education. Students were more oriented to life and less to caring, nursing expertise, and an attitude toward advocacy and empathy. For example, students held less-strong views about the importance of professional development in nursing, the inner drive to take care of others, and being compassionate as a nurse. This suggests that MBO-V students' expectations of the nursing profession are incongruent with what they perceive during their education. It also suggests that there is a misconception in their pre-existing knowledge about the actual concepts of nursing. This misconception was also noticed by Hoeve et al. (2014) who discussed the fact that there is a discrepancy in the interpretation of the concept of caring before and during nursing education.<sup>33</sup> The students in this study did not undergo clinical placements during the first five months, which could explain the unmet expectations related to caring. Previous studies have shown that students perceive more stress and demotivation and are more likely to withdraw from

their education when confronted with experiences that do not match their views.<sup>18,20,21</sup> These results are important for nurse educators to tailor future retention procedures.

The transition to higher education can be challenging for students. Larose et al. (2005) have discussed that students not only have to adapt to the new social environment, but it is also expected that students show more responsibility for their academic progress and personal life.<sup>34</sup> The increasing life orientation found in this study may arise from the struggle that students experience managing their studies and personal life. Last and Fulbrook (2003) have supported the perceived challenges that students experience when confronted with new educational demands and simultaneously balancing their social life.<sup>22</sup>

In line with previous studies<sup>14,25,35</sup> it was not unexpected to find that selecting nursing as first-choice program and aiming for a career in nursing influence a more positive orientation to nursing, in particular with respect to caring. This is also consistent with other studies that found that students' main motivation to become nurses came from the desire to care for others and altruistic beliefs.<sup>17,36-38</sup> Moreover, such autonomous motives for becoming a nurse have been found to influence students' career choices and educational outcomes.<sup>12</sup> For example, Salamonson et al. (2014) have demonstrated that students who selected nursing as their first-choice program were more likely to complete the program.<sup>35</sup>

Interestingly, this study found that not having nursing as a first-choice program influenced a more positive attitude toward nursing agency. It could be argued that these students are more focused on developing competencies related to improving patients' outcomes rather than caring for patients. This statement is supported by Miers et al. (2007) who have found that "*service orientation*" is a motivator for choosing nursing as a career and that wanting to take care of others is not the only interest of students who choose nursing.<sup>39</sup> Students might choose nursing for various reasons, which were not identified in this study.

### *Strengths and limitations*

This study is one of the first studies investigating OAs among MBO-V students and included students from the north and central part of the Netherlands which enhance generalizability within the Dutch context. The large study sample complies with the power of the study. However, because of the homogeneous study population, some of the results need to be treated with caution. Another limitation of the study is that the explained variance of the influencing characteristics for more positive OAs is low. We also only asked if nursing was or was not students' first-choice program and did not investigate other possible components that influence students' career choice. Nonetheless, the revealed significant influencing characteristics indicate the importance of the association with students' OAs.

### *Conclusions*

MBO-V students at the start of their education are positive toward the nursing expertise, caring, advocacy and empathy, and nursing agency aspects of the profession. Students agree the most with items that reflect personal and professional development and the use of knowledge in the nursing practice. After five months, students are more life oriented, while nursing expertise, caring, and advocacy and empathy decreased. Knowing students' OAs and demographic characteristics before and during education can give nurse educators a better understanding of students' expectations and address their needs to improve retention.

### *Recommendations*

The results challenge nurse educators to be aware and make students aware of their OAs toward nursing before and during education. Addressing students' expectations and adjusting a realistic image of nursing could contribute to a more informed and deliberate career choice for students during recruitment and selection procedures. The results, especially the changing OAs, also specify how to tailor the content of the study program in order to get a better affiliation with the expectations of MBO-V students in favor of retention. Therefore, supervision during education is recommended, but also clinical placements during the first semester with the focus on caring for people.

With the available time we collected data during the first five months of education. A longitudinal study is recommended to follow students until the end of the program to identify if their OAs change throughout nursing education. A mixed methods design should be considered to investigate different reasons for nursing career choices and retention in relation to OAs and demographic characteristics, and to get an understanding of factors that are associated with attrition.

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## Tables

**Table 1**

Demographic characteristics.

	Pretest (N=454)	Posttest (N=420)
<i>Gender % (n)</i>		
Male	13.2 (60)	12.6 (52)
Female	86.6 (393)	87.3 (365)
<i>Age, mean (SD)</i>		
15-17 years % (n)	76.0 (345)	69.1 (289)
≥18 years % (n)	23.6 (107)	30.9 (129)
Living with parent(s) % (n)	91.6 (416)	91.6 (383)
<i>Preliminary education % (n)</i>		
Vocational	85.9 (390)	
Non-vocational	14.1 (64)	
<i>(previous) Problems with program % (n)</i>		
Study related problems	39.9 (181)	29.2 (122)
Personal problems	13.0 (59)	10.3 (43)
Study and personal problems	7.5 (34)	6.0 (25)
Nursing/caring experience % (n)	50.2 (228)	48.1 (201)
Nursing as first-choice program % (n)	83.9 (381)	
<i>Career ambition % (n)</i>		
Nursing career	92.3 (419)	84.2 (352)
Other career	5.5 (25)	12.7 (53)

Abbreviations: SD= standard deviation.

**Table 2**

Participants' responses for 'caring orientation', 'nursing expertise' and 'life orientation' at the pretest (N=454).

	SA	A	U	D	SD	M <sup>a</sup>
	%	%	%	%	%	
<b>Caring orientation scale</b>						
1) I've dreamt of becoming a nurse since I was a child	15.6	21.1	<b>25.1</b>	22.2	15.6	3.89
2) Nursing is a calling	9.9	<b>47.6</b>	34.1	6.2	1.1	3.60*
3) A nurse must have a powerful need to take care for others	<b>54.6</b>	43.6	1.1	---	---	4.54
4) It is important to me that I get to study nursing	35.2	<b>52.2</b>	10.8	1.3	---	4.22**
5) Working as a nurse gives my life a meaningful content	20.3	<b>50.9</b>	24.9	3.1	0.4	3.88**
6) I expect as a nurse I have an opportunity to develop as a person	28.6	<b>58.4</b>	12.1	0.4	0.2	4.15
<b>Nursing expertise orientation scale</b>						
1) I chose nursing because of the variety of jobs available	34.1	<b>47.6</b>	12.8	4.2	1.1	4.10
2) I am confident I will become a good nurse	30.8	<b>56.8</b>	11.2	0.4	0.2	4.18
3) One of the most important qualities of a nurse is mental strength	24.0	<b>58.1</b>	16.7	0.4	---	4.06
4) In nursing I can choose my working field according to my personal interests	33.7	<b>55.3</b>	10.1	0.9	---	4.22
5) I expect this training to give me a possibility to progress in my career	32.8	<b>56.4</b>	9.5	0.4	---	4.23**
6) In nursing I can learn to understand myself and others better than in some other professions	17.2	<b>44.3</b>	30.6	7.0	0.4	3.71**
<b>Life orientation scale</b>						
1) I would not have started studying nursing here if it had meant moving away from my family	4.4	9.3	<b>37.4</b>	31.7	16.7	2.53***
2) I would have applied to study here earlier but it was not possible because of where my family was living	0.4	0.9	13.9	13.2	<b>70.9</b>	1.46
3) My study is dependent on the financial situation in my family	2.0	10.1	21.1	16.1	<b>50.0</b>	1.97
4) I applied to study nursing because I was unemployed/going to be unemployed	0.4	1.3	5.1	7.0	<b>85.9</b>	1.23
5) I do not want to make decisions in my life that would risk my family being together	16.1	20.3	<b>37.9</b>	10.6	15.2	3.11

Abbreviations: SA = Strongly Agree (5); A = Agree (4); U = Uncertain (3); D = Disagree (2); SD = Strongly Disagree (1);

Note:

<sup>a</sup> M = mean total score (range 1.0 – 5.0).

\* Wilcoxon paired-rank test: mean rank significantly lower at posttest,  $p < .05$  (N=362).

\*\* Wilcoxon paired-rank test: mean rank significantly lower at posttest,  $p < .01$  (N=362).

\*\*\* Wilcoxon paired-rank test: mean rank significantly higher at posttest,  $p < .001$  (N=362).

**Table 3**

Demographic characteristics and factor scores on orientation (N=454).

Variable	NOT			Caring orientation scale			Nursing expertise scale			Life orientation scale		
	Median (IQR) <sup>a</sup>	z	p	Median (IQR) <sup>a</sup>	z	p	Median (IQR) <sup>a</sup>	z	p	Median (IQR) <sup>a</sup>	z	p
Gender		-1.35	.892		-.79	.428		-.70	.481		-.442	.658
Female	3.41 (3.24-3.60)			3.83 (3.63-4.17)			4.00 (3.83-4.33)			2.00 (1.80-2.40)		
Male	3.41 (3.18-3.65)			3.83 (3.50-4.17)			4.17 (3.83-4.50)			2.20 (1.60-2.60)		
Age		-.19	.848		-.18	.861		-1.01	.311		-.008	.994
≤17	3.41 (3.24-3.59)			3.83 (3.67-4.17)			4.00 (3.83-4.33)			2.00 (1.80-2.40)		
≥18	3.41 (3.18-3.65)			3.83 (3.50-4.33)			4.17 (3.83-4.50)			2.00 (1.60-2.50)		
Living status		-.42	.676		-.64	.522		-.77	.443		-.912	.362
living at home	3.41 (3.24-3.64)			3.83 (3.67-4.17)			4.00 (3.83-4.33)			2.00 (1.80-2.40)		
living independent	3.41 (3.11-3.65)			3.83 (3.50-4.25)			4.17 (3.83-4.33)			2.20 (1.40-2.50)		
Preliminary education		-1.12	.263		-.70	.487		-.13	.893		-.748	.454
Vocational	3.41 (3.24-3.65)			3.83 (3.67-4.17)			4.00 (3.83-4.33)			2.00 (1.80-2.40)		
non-vocational	3.35 (3.19-3.59)			3.83 (3.50-4.17)			4.00 (3.83-4.33)			2.00 (1.60-2.60)		
Nursing experience		-1.34	.179		-1.31	.192		-.76	.447		-.534	.593
Yes	3.41 (3.24-3.65)			3.83 (3.67-4.33)			4.00 (3.83-4.33)			2.00 (1.80-2.40)		
No	3.41 (3.24-3.59)			3.83 (3.52-4.17)			4.00 (3.83-4.33)			2.00 (1.80-2.40)		
Nursing as first-choice		-2.06	.039*		-3.97	.000***		-.07	.946		-.204	.839
Yes	3.41 (3.24-3.65)			3.83 (3.67-4.33)			4.00 (3.83-4.33)			2.00 (1.80-2.40)		
No	3.35 (3.14-3.53)			3.67 (3.38-4.00)			4.08 (3.83-4.33)			2.20 (1.45-2.60)		
Nursing career choice		-2.37	.018*		-2.64	.008**		-1.82	.070		-.869	.385
Nursing career	3.41 (3.24-3.65)			3.83 (3.67-4.17)			4.17 (3.67-4.33)			2.00 (1.80-2.40)		
Other career	3.29 (3.03-3.44)			3.67 (3.50-3.83)			3.83 (3.67-4.33)			2.00 (1.60-2.40)		

Abbreviations: NOT: Nursing Orientation Tool; IQR: interquartile range.

Note:

<sup>a</sup> Range 1.0 - 5.0.

\* p-Value significant at 0.05.

\*\* p-Value significant at 0.01.

\*\*\* p-Value significant at 0.001.

**Table 4**

Participants' responses for 'nursing agency' and 'advocacy and empathy' at the pretest (N=454)

	SA %	A %	U %	D %	SD %	M <sup>a</sup>
<b>Nursing agency scale</b>						
1) Nurses consistently update their practice in relation to current healthcare trends	25.1	<b>59.9</b>	12.3	2.2	0.2	4.08
2) It takes intelligence to be a nurse	9.9	<b>50.4</b>	29.1	8.8	1.1	3.60
3) Nurses should have a baccalaureate degree for entrance into practice	1.5	7.3	<b>52.0</b>	21.4	17.2	2.54
4) Nurses with advanced degrees make important contributions to patient care	6.8	30.8	<b>51.1</b>	7.7	3.3	3.30
5) Nurses are capable of independent practice	42.1	<b>53.3</b>	2.6	0.9	0.2	4.37
6) The service given by nurses is as important as that given by physicians	32.4	<b>53.1</b>	11.0	2.9	---	4.16
7) Research is vital to nursing as a profession	11.5	<b>49.3</b>	36.6	2.0	0.2	3.70
8) Nurses participate in the development of health care policies	23.8	<b>63.7</b>	12.1	0.2	---	4.11
9) Nurses act as resource persons for individuals with health problems	20.5	<b>58.8</b>	17.2	2.6	0.4	3.97
10) Nurses integrate health teaching into their practice	7.0	<b>47.8</b>	43.0	1.3	---	3.61
11) Nurses speak out against inadequate working conditions	9.9	<b>46.0</b>	42.1	1.1	0.2	3.65
12) Nurses follow the physician's orders without questions	1.8	13.0	30.2	<b>41.0</b>	13.4	3.52
13) Nurses incorporate research findings into their clinical practice	14.3	<b>61.8</b>	23.6	0.7	0.2	3.89
14) The major goal of nursing research is to improve patient care	27.5	<b>58.1</b>	12.3	1.3	0.2	4.12
<b>Advocacy and empathy scale</b>						
1) Nurses are patient's advocates	26.0	<b>61.0</b>	12.3	0.7	---	4.12
2) Nurses protect patients in the health care system	33.9	<b>59.5</b>	6.6	---	---	4.27
3) Nurses in general are kind, compassionate human beings	31.1	<b>54.8</b>	10.1	2.9	0.2	4.15*
4) Nurses value time at the bedside caring for patients.	33.0	<b>59.5</b>	6.8	0.4	---	4.25*

Abbreviations: SA = Strongly Agree (5); A = Agree (4); U = Uncertain (3); D = Disagree (2); SD = Strongly Disagree (1);

Note:

<sup>a</sup> M = mean total score (range 1.0 – 5.0).\* Wilcoxon paired-rank test: mean rank significantly lower at posttest,  $p < .01$  (N=362).

**Table 5**

Demographic characteristics and factor scores on attitude towards nursing (N=454).

Variable	NAQ			Nursing agency scale			Advocacy and empathy scale		
	Median (IQR) <sup>a</sup>	z	p	Median (IQR) <sup>a</sup>	z	p	Median (IQR) <sup>a</sup>	z	p
Gender		-.12	.906		-.21	.832		-.12	.902
Female	3.83 (3.67-4.00)			3.71 (3.57-3.93)			4.25 (4.00-4.50)		
Male	3.86 (3.62-4.06)			3.71 (3.51-3.98)			4.24 (4.00-4.50)		
Age		-.33	.745		-.60	.546		-.60	.549
≤17	3.83 (3.61-4.03)			3.71 (3.57-3.93)			4.25 (4.00-4.50)		
≥18	3.89 (3.67-4.06)			3.78 (3.57-3.93)			4.00 (4.00-4.50)		
Living status		-.89	.375		-.89	.375		-.47	.642
living at home	3.83 (3.61-4.06)			3.71 (3.57-3.93)			4.25 (4.00-4.50)		
living independent	3.88 (3.67-3.97)			3.76 (3.61-3.93)			4.00 (4.00-4.63)		
Preliminary education		-.15	.884		-.44	.663		-.54	.589
Vocational	3.83 (3.62-4.00)			3.71 (3.57-3.93)			4.25 (4.00-4.50)		
non-vocational	3.80 (3.67-4.06)			3.75 (3.57-4.00)			4.00 (3.81-4.50)		
Nursing experience		-.31	.755		-.52	.604		-.02	.985
Yes	3.83 (3.67-4.06)			3.71 (3.57-3.93)			4.25 (4.00-4.50)		
No	3.83 (3.61-4.00)			3.71 (3.55-3.93)			4.25 (4.00-4.50)		
Nursing as first-choice		-1.94	.053		-2.46	.014*		-.07	.947
Yes	3.83 (3.61-4.00)			3.71 (3.54-3.93)			4.25 (4.00-4.50)		
No	3.91 (3.72-4.10)			3.85 (3.57-4.07)			4.25 (4.00-4.50)		
Nursing career choice		-.45	.652		-.02	.983		-1.5	.124
Nursing career	3.83 (3.67-4.06)			3.71 (3.57-3.93)			4.25 (4.00-4.50)		
Other career	3.88 (3.54-4.06)			3.71 (3.50-4.00)			4.00 (3.75-4.50)		

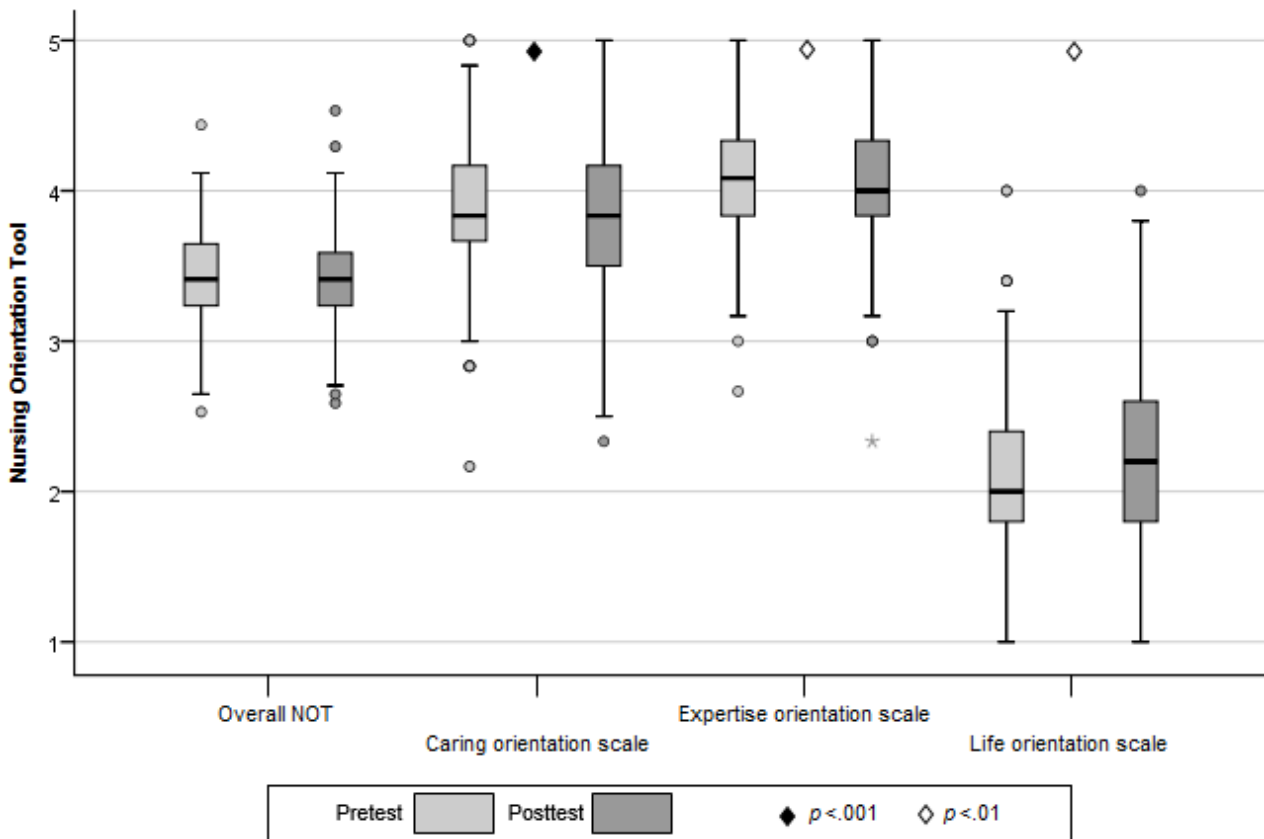
Abbreviations: NAQ: Nursing Attitude Questionnaire; IQR: interquartile range.

Note:

<sup>a</sup> Range 1.0 - 5.0.

\* p-Value significant at 0.05.

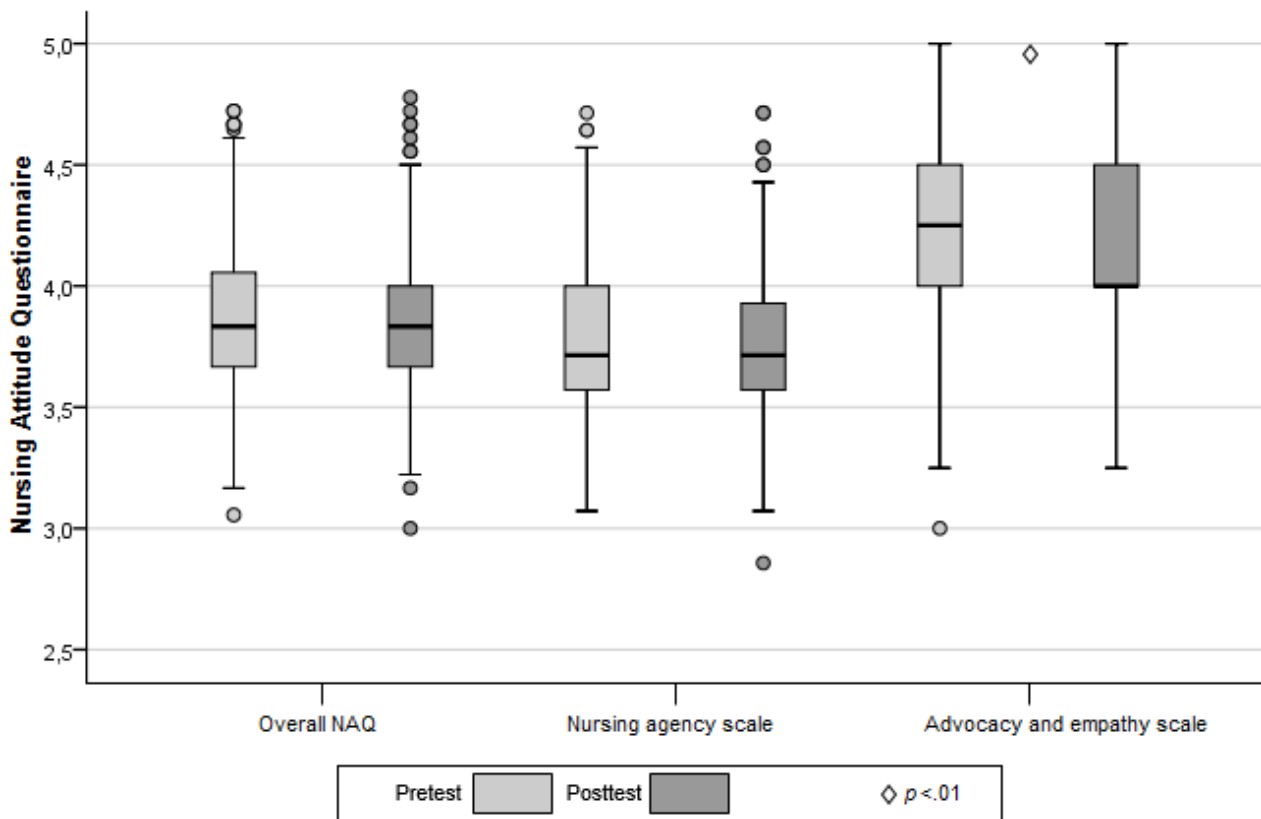
## Figures



**Figure 1.** Box and whisker plots comparing the median scores on the Nursing Orientation Tool and its subscales at the pretest and posttest (N=362).

Abbreviations: NOT: Nursing Orientation Tool.

Note: The Nursing Orientation Tool consists of 17 items using a five-point Likert scale.



**Figure 2.** Box and whisker plots comparing the median scores on the Nursing Attitude Questionnaire and its subscales at the pretest and posttest (N=362).

Abbreviations: NAQ: Nursing Attitude Questionnaire.

Note: The revised Nursing Attitude Questionnaire consists of 18 items using a five-point Likert scale.

## Appendix 1

### 1) *Development and measurement properties of the nursing orientation tool (NOT)<sup>25,26</sup>*

Process	Measurement property	How it is measured	Results
<b>Domain identification</b>	Concept of cognitive orientation to nursing	Grounded Theory / inductive study	Item generation derived on the basis of operationalization of the concepts: 26 items were formulated.
<b>Panel evaluation</b>	Readability	Clarity of the expression	80-100% agreement Mean: 96% (SD=5.6)
<b>(Sample: third year nursing students N=15)</b>	Homogeneity	Paper and pencil assessment (first stage reliability)	Fairly homogeneous: Three items: <60% (revised according to comments) Seven items: 60-80% 16 items: >80%
	Content validity	Panel evaluation / Interrater reliability: Content validity index (CVI)	CVI: Ratings within 73-100%
<b>Reliability and validity of the instrument</b>	Item analysis	Discrimination Index (D value >.20 desirable)	Satisfactory with nine items (D value between .20 - .30)
	Internal consistency	Theta coefficient / Crohnbach's Alpha	All 26 items, Theta: .84  Subscales, Alpha: 1) caring 12 items: .75 2) nursing expertise eight items: .70 3) life orientation six items: .74
<b>(Sample: voluntary nursing students (N=184))</b>	Stability	Test-retest reliability (one-month stability) (third year nursing	Per cent agreement all items: 88-100%



	students N=25) using per cent agreement and Cohen's Kappa (adjusted)	Cohen's Kappa: Seven items were asymmetrical (positive/negative skewed), for the remaining 19 items: Eleven items met the Kappa criterion: >.41 Fair with seven items, ranging between .210 to .3169 Slight with one item: .1206
Construct validity	Confirmatory factor analysis	Three factors (subscales) explained 35,3% of the variance and the three factors agreed with the domain concept: caring, nursing expertise, life orientation. Using the cut-off point of .40 the three factor solution consisted of 15 items.
Internal consistency (15 items)	Theta coefficient / Crohnbach's Alpha	All 15 items, Alpha: .79  Subscales, Alpha: 1) caring five items: .71 2) nursing expertise six items: .67 3) life orientation four items: .74
<b>NOT questionnaire</b>	Eventually 17 items met the psychometric criteria: 1) caring orientation six items 2) nursing expertise six items 3) life orientation five items	
<b>Conclusion authors NOT questionnaire</b>	Instrument suitable for analysis	

**2) Development and measurement properties of the reduced nursing attitude questionnaire (NAQ)<sup>14</sup>**

<b>Process</b>	<b>Measurement property</b>	<b>How it is measured</b>	<b>Results</b>
<b>Panel evaluation</b>  <b>(Sample: research team (N=4))</b>	Content validity / face validity	Meaning of each item was examined: open discussion	Based on group consensus eighteen items were used for further analysis.
	Concept analysis	Literature	Two core concepts were found (subscales): 1) Nursing agency 2) Advocacy and Empathy
<b>Reliability and validity of the instrument</b>  <b>(Sample: Nursing students (N=1414))</b>	Construct validity	Exploratory factor analysis (EFA) / Confirmatory factor analysis (CFA)	EFA: two factor-model  CFA: goodness-of-fit: CFI: .90 (>.90), RMSEA: .046 (<.06), NNFI: .87 (>.80).
	Internal consistency	Crohnbach's Alpha	All eighteen items: .79 Subscales: 1) Nursing agency, fourteen items: .74 2) Advocacy and empathy, four items: .63
<b>Conclusion authors reduced NAQ</b>	Instrument suitable for analysis		