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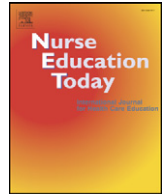
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# The relationship between critical thinking skills and self-efficacy beliefs in mental health nurses

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## SUMMARY

**Background:** In the Netherlands, the distinction between Bachelor degree and diploma nursing educational levels remains unclear. The added value of Bachelor degree nurses and how they develop professionally after graduation are subject to debate.

**Objectives:** The aim of this study is to investigate whether Bachelor degree nurses have higher critical thinking skills than diploma nurses do and whether there is a positive relationship between higher critical thinking skills and self-efficacy beliefs. Outcomes might provide instruments that are helpful in positioning of nursing levels in education and practice.

**Participants:** Questionnaire data were used of a sample of 95 registered mental health staff nurses (62 diploma nurses and 33 Bachelor degree nurses).

**Methods:** First, ANOVA was performed to test whether the two groups were comparable with respect to elements of work experience. Second, t-tests were conducted to compare the two groups of nurses on self-efficacy, perceived performance and critical thinking outcomes. Third, relationships between the study variables were investigated. Finally, structural equation modelling using AMOS was applied to test the relationships.

**Results:** The hypothesis that Bachelor degree nurses are better critical thinkers than diploma nurses was supported ( $p < 0.01$ ). Years in function turned out to be positively related to self-efficacy beliefs ( $p < 0.01$ ). No significant relation was found between the level of education and self-efficacy beliefs.

**Conclusions:** The results of this study support career development and facilitate more efficient positioning of nursing levels.

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## Introduction

### Background of the Study

This article examines the effect of cognitive abilities, here defined as critical thinking skills. The aims of this study are to investigate whether Bachelor degree nurses in mental healthcare in the Netherlands possess higher critical thinking skills than diploma nurses do, and to examine whether these skills are positively related to self-efficacy and perceived performance. If the latter is the case, then this would provide additional outcomes that can be used to assess (Bachelor degree) nursing competences, to develop ways of supporting the development of these competences, and to help position Bachelor degree and diploma nurses in mental health nursing. In the last decade, the positioning of these nursing levels is subject to debate in the Netherlands (Beckers and Nijhuis,

2005; VBOC, 2006; V&VN, 2012). Earlier research results from Den Boer and Hovels (2003) as well as Taminiau and Den Boer (2004) showed that too many Bachelor degree nurses operate at a diploma nursing level. Although in recent years, no new research has been published on this topic, opinions did not change (V&VN, 2012). Differentiation of nursing levels in practice is still poor, even though Bachelor degree nursing programmes differ considerably from diploma nurse programmes. This is based on the assumption that Bachelor degree nurses are better critical thinkers. Howenstein et al. (1996) provided evidence for this assumption: they found that the relationship between educational level and critical thinking skills was significant.

To date, it is known that critical thinking is essential to nursing education (Redding, 2001; American Association of Colleges of Nursing, 2005; McMullen and McMullen, 2009; Romeo, 2010) as well as nursing practice (Facione and Facione, 1996; Kuiper et al., 2010). Critical thinking skills are essential because of the increasing complexity of care demands for nurses in general healthcare (GGZNederland, 2010; Kaddoura, 2010). To deal with these demands nurses need to feel confident (Kaddoura, 2010). They have to evaluate their performance as a means of assessing their competencies. Evaluating oneself as being capable of fulfilling tasks in accordance with professional standards requires critical thinking skills

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such as reflective and analytical skills. This process is known as self-evaluation: the forming of perceptions and feelings about self-worth or competences (Judge et al., 2000; Steyn and Mynhardt, 2006). Bandura (1997) introduced the self-efficacy concept, which encompasses self-evaluation. Bandura states that an individual forms self-efficacy beliefs based on information derived from different sources (1989, 1997). The better an individual's thinking skills, the better this person can evaluate himself, which is expected to positively influence self-efficacy. This has implications for (continuing) education in nursing practice and staff development. Nurses need to learn how to apply critical thinking skills to assess their own competences. Research often focuses on the relationship between critical thinking skills and clinical decision making. Focusing on the relationship between critical thinking skills and self-efficacy beliefs will help give direction to the professional development of (newly graduated) diploma degree and Bachelor degree nurses.

### Critical Thinking

There are various definitions of critical thinking (Brunt, 2005; Moon, 2008; Romeo, 2010). The dominant perspective in literature is on the cognitive component. Several authors (Facione and Facione, 1996; Fisher, 2001; Simpson and Courtney, 2002; Wilkinson, 2008; Cormier et al., 2010) state that a fundamental set of cognitive abilities is indispensable to critical thinking. For example, Wilkinson (2008, p53) defines cognitive abilities as: "intellectual activities executed within complex processes of thinking such as conducting critical analysis, solving problems and making decisions". This is in line with Moon's (2008, p33) definition of critical thinking: "the assessment of what might be called evidence, in order to make a judgment".

In international literature about nursing and nursing education, there is a lot of interest in the concept of critical thinking (Kuiper and Pesut, 2004). Several studies have been conducted to identify critical thinking as a factor in nursing. For example, Stewart and Dempsey (2005) investigated the relationship between critical thinking and nursing diagnoses, and Lee et al. (2006) reviewed literature on the subject. A number of studies investigating critical thinking in nursing have been conducted in the context of nursing education (Fero et al., 2009). However, Romeo (2010) states that there is a lack of quantitative studies that use critical thinking skills as an independent variable. Other studies have been conducted using samples of registered nurses, but research on graduate critical thinking skills of nurses is less extensive and fairly dated. For example, Howenstein et al. (1996) assessed nurses' critical thinking skills and found age and experience as not being significant, but educational level as being significant. Worldwide, health care institutions and educational institutions are familiar with the concept of critical thinking. Nursing education programmes recognize the importance of developing critical thinking skills (Brunt, 2005; McMullen and McMullen, 2009; Cormier et al., 2010). It is therefore a frequently measured outcome, widely used for several purposes (Redding, 2001). In this study, the focus is on the mediating role of critical thinking skills in evaluating one's performance.

### Self-efficacy and Perceived Performance

Self-efficacy is the belief in one's competence to tackle difficult or novel tasks and to cope with adversity in specific demanding situations. Self-efficacy makes a difference in how people feel, think, and act. People with high levels of self-efficacy choose to perform more challenging tasks. They set themselves higher goals and stick to them (Zulkosky, 2009). Bandura (1997) stated that self-efficacy is the belief in one's capabilities to organize and execute the courses of action required to produce given attainments. Those with high self-efficacy beliefs want to overcome difficult situations instead of avoiding them (McLaughlin et al., 2008). Increasing self-efficacy enhances the sense of self-control and helps one to perform at a higher level (Bandura and Locke, 2003).

According to Bandura (1997), there are four sources of information that serve as the basis for assessing one's level of self-efficacy: performance accomplishments, vicarious experiences, verbal persuasion and emotional and physiological arousal. It is common in nursing (education) practice to use the above mentioned sources to enhance self-efficacy. For example the use of verbal persuasion: Providing feedback and support (convincing the other that he is capable of fulfilling a certain task) at an individual level in learning situations (McConville and Lane, 2006).

Self-efficacy beliefs relates highly to performance (Dunlap, 2005; Kuiper et al., 2010): an increase in self-efficacy beliefs leads to an improvement of performances. Hence, performances can be considered as a (partially) result of self-efficacy beliefs. This result or outcome measure, more specific, how one evaluates and rates its own performance, is known as perceived performance. Perceived performance is often used as a self-reported measure of competence or performance. Brady Germain and Cummings (2010) for example, used perceived performance as a measure to illustrate nurses' self-ratings.

### The Relationship between Critical Thinking and Self-efficacy

Positive correlations between the level of critical thinking and the level of self-efficacy are expected. In order to evaluate one's own level of self-efficacy, one has to use cognitive skills such as analytical and reflective skills (Kuiper et al., 2010). The better the cognitive ability, the more accurate the judgement of one's ability to accomplish tasks will be (Chen et al., 2001; Cormier et al., 2010). According to Bandura (1989), one of the core competences of self-efficacy is being able to predict occurrences and to decide how to deal with them. He sees this as a major function of thinking. Truxillo et al. (2008) define cognitive ability as the ability to process complex information, which is an important factor in assessing one's performance.

The information that is processed comes from the sources mentioned above (Bandura, 1997). The summation rule, a so-called integration rule (Steyn and Mynhardt, 2006) can be applied here. When using the summation rule one uses more than one source. The underlying idea is that using information coming from two sources, for example, will have a greater influence on the formation of self-efficacy perceptions than just one.

Hence, integrating information from various sources is crucial in the formation of self-efficacy beliefs. One would expect that the better an individual succeeds in integrating the information coming from various sources, the better this person is able to define his or her level of self-efficacy. For example, Truxillo et al. (2008) found a positive relationship between the self-assessment on test performances and the level of meta-cognitive skills: the higher these skills, the more accurate the judgement of own performance. McLaughlin et al. (2008) also found a positive relationship between self-efficacy and academic performance. However, the question is if solely the level of cognitive ability skills, i.e. critical thinking skills, is positively related to self-efficacy levels. Based on Bandura's rule of performance accomplishments, one might expect experienced nurses to show higher levels of self-efficacy beliefs. This should be so especially if they have spent a substantial period of time working in the same work environment. Benner's theoretical concepts would support this. According to Benner (1984), a nurse at the expert level knows instinctively what to do when confronted with certain situations. It is likely that experience in the field of nursing leads to a higher level of self-efficacy. However, nurses with a Bachelor's degree are believed to use higher levels of cognitive skills: in higher education nursing programmes students for example learn how to analyse situations, reflect on their performance, evaluate interventions and make clinical judgements. In other words, they learn how to develop meta-cognitive skills known as critical thinking skills. This helps them cope with difficult, more complex and unexpected situations. They show initiative in learning how to deal with these kinds of situations, and thereby increase their

level of self-efficacy. As [McLaughlin et al. \(2008\)](#) stated: they make an effort to overcome difficult situations.

**Fig. 1** illustrates the theoretical model. Higher level critical thinking skills are expected to occur among Bachelor degree nurses. Based on Bandura's theory of the formation of self-efficacy beliefs ([1997](#)) and the role of cognitive ability in this process ([Chen et al., 2001](#); [McLaughlin et al., 2008](#); [Truxillo et al., 2008](#); [Cormier et al., 2010](#)), these cognitive abilities will function as a mediating variable and will show positive correlations with self-efficacy beliefs and perceived performance. In the model it is also expected that years of experience in the field and years in function positively correlate with self-efficacy beliefs and perceived performance ([Lenz and Shortridge-Bagget, 2002](#); [Marshburn et al., 2009](#)). However, higher critical thinking skills combined with experience and years in function as a staff nurse are expected to lead to higher self-efficacy beliefs and higher scores on perceived performance.

### The Aims of the Research

The aim of this study is to investigate whether Bachelor degree nurses show higher critical thinking skills than diploma nurses and whether there is a positive relationship between these skills and levels of self-efficacy and perceived performance. This leads to the following hypotheses:

- 1) nurses with a Bachelor degree show higher scores on critical thinking abilities than diploma nurses do;
- 2) critical thinking skills mediate the relationship between levels of education and self-efficacy beliefs.

## Methods

### Recruitment of Participants

Management staff members (department heads) were asked to provide access to nursing staff. A total of 300 nurses were approached to participate in this study. Ethical approval was obtained via heads of department. No patients or patient information was involved in this study. Participation was voluntary and based on informed consent. The inclusion criteria were: participants are registered nurses (diploma nurses or Bachelor degree nurses), and are employed as a staff nurse in a mental health care institution in a clinical setting in the Netherlands. Mental health organisations in different parts of the Netherlands were approached and head of departments and wards were asked if their entire nursing staff could participate. This was done to avoid over- or under-representation of Bachelor degree or diploma nurses. A questionnaire survey design was adopted.

### Data Collection

Data collection took place in group sessions between September 2009 and May 2010. An introductory talk explained the purpose of the research, followed by verbal instructions. Every part of the questionnaire contained a written instruction. The researcher was present

during the planned 1.5 hour sessions and was available to answer questions about the procedure. The questionnaires were collected at the end of the sessions, but if respondents were unable to finish during the group session, they were asked to return their questionnaire by regular mail. Anonymity was guaranteed: respondents were not asked to fill in their name.

### Instruments

Critical thinking skills were measured using the Dutch version of the Watson Glaser Critical Thinking Appraisal (WGCTA). The WGCTA is a commonly used instrument to measure critical thinking skills ([Worrel and Profetto-McGrath, 2007](#)). The Dutch version was first released in 1999 and revised in 2006 ([Harcourt, 2007](#)). The internal consistency of this revised and translated version (KR20: .81, split-half reliability: .71) appears to be good ([Harcourt, 2007](#)). The WGCTA is divided into five subscales: assumptions, deductions, interpretations, evaluations and conclusions. In each subscale, short cases are presented along with 12 hypotheses. On the scales of assumptions, deductions and interpretations, answers are "yes" or "no". Evaluations are scored giving an opinion on the strength of the arguments: "strong" or "weak". Conclusions are scored on a 5-item Likert type scale, ranging from "true" to "not true". The maximum score on the WGCTA is 60 (12 items per scale) and the minimum is 0. To provide detailed insight into relations between the variables, scores on the WGCTA as well as scores on its subscales are reported.

Self-efficacy was measured using a general self-efficacy scale and a perceived performance scale. Both scales were developed especially for this study. Reliability of the Self-Efficacy and the Perceived Performance scales was respectively Cronbach's Alpha's 0.605 and 0.730.

The self-efficacy scale consists of four items which are derived from the Generalized Self-Efficacy Scale ([Schwarzer and Jerusalem, 1995](#)). The items are as follows: 1, "Whatever happens at work, I can usually handle it"; 2, "When I am confronted with a problem at work, I can usually find several different solutions"; 3, "I can remain calm when confronted with difficulties in my job because I can rely on my skills"; 4, "I can perform without making mistakes". Perceived Performance was measured using five items. Respondents were asked how well they performed as follows: "In the past week, how well would you say that you: 1, made decisions; 2, made efforts; 3, achieved your goals; 4, showed initiative; 5, assumed responsibility".

All items were scored on a 5-point Likert-scale (1 = strongly disagree, 5 = strongly agree).

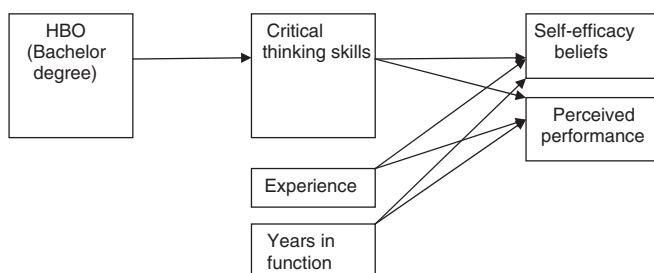
Participants were also asked to fill in the following items: highest level of education, age, years of experience as a nurse, and years in present position. The latter item was included because a relatively new job or position might influence self-efficacy beliefs. For example, a nurse can be an expert in providing critical care for the elderly; a transition to a different field of nursing, for example child care, could then imply a lower level of mastery and hence influence his or her self-efficacy beliefs.

### Data Analysis

The data were analysed using SPSS version 17.0. First, ANOVA was performed to test whether the two groups were comparable with respect to work experience. T-tests were conducted to investigate relationships between the two nursing levels and self-efficacy, perceived performance and critical thinking skills. Next, Pearson's correlations between all the variables of the study were calculated. To test the model as illustrated in **Fig. 1**, structural equation modelling using AMOS was applied.

## Results

A total of 95 participants (29 male, 66 female) completed a set of tests and questionnaires. Their mean age was 36.78 (sd = 11.97), ranging from 21 years to 59 years. Their mean years of experience



**Fig. 1.** Model relationship educational level, critical thinking and self-efficacy.



in the field of nursing was 12.66 (sd = 10.88), ranging from 1 year to 39 years. Sixty-two nurses had completed a nursing course at the intermediate vocational level (MBO) while 33 nurses held a Bachelor degree in nursing (HBO). A power analysis was performed which showed that the sample was higher than the minimal number required. We performed ANOVA to compare the Bachelor degree nurses group with the diploma nurses group. Table 1 shows that there is no significant difference between the two groups regarding years of experience, years in function and date of diploma.

Table 2 lists the mean scores, standard deviations and t-values of the two groups included in the study (diploma and Bachelor degree nurses) on critical thinking, self-efficacy and perceived performance.

Table 3 illustrates Pearson's correlations between the variables included in this study. We examined relationships between educational level, years of experience, years in function, critical thinking, self-efficacy and perceived performance. The correlation between level of education (MBO/HBO) and overall scores on the WGCTA is significant ( $r = .354$ ;  $p = .000$ ), as are the correlations between level of education and scores on the following WGCTA subscales: "Assumptions" ( $r = .419$ ;  $p = .000$ ), "Deductions" ( $r = .228$ ,  $p = .026$ ) and "Conclusions" ( $r = .256$ ;  $p = .012$ ). Correlations between level of education and scores on the WGCTA subscales "Interpretations" ( $r = .187$ ;  $p = .069$ ) and "Evaluations" ( $r = .069$ ;  $p = .504$ ) turned out to be not significant.

A significant relationship between level of critical thinking and scores on self-efficacy only was found at the WGCTA subscale "conclusions" ( $r = .232$ ;  $p = .023$ ).

The variables of years of experience and years in function are positively correlated to scores on the Self-Efficacy scale (respectively  $r = .277$ ;  $p = .007$  and  $r = .297$ ;  $p = .003$ ).

As Table 3 shows, results do not entirely fit the model as presented in Fig. 1. Structural equation modelling, using AMOS, showed that the model as a whole (with correlated errors) had a good fit with the data (Chi Square = 9.44;  $df = 41$ ;  $p = .80$ ; Goodness of Fit = .98; Adjusted Goodness of Fit = .93; Root Mean Square Error of Estimation = .00). Fig. 2 shows the significant relationships between education and critical thinking abilities and the factors that are associated with self-efficacy.

## Discussion

This study sought to examine the hypothesis stating that nurses with a Bachelor degree show higher scores on critical thinking abilities and that these abilities mediate levels of self-efficacy. More precisely, Bachelor degree nurses are expected to be more accurate in evaluating information on which levels of self-efficacy are based. Hence, it is expected that they undertake targeted action to become more competent when they fail and that they gain confidence when they succeed. It is expected that this will lead to higher levels of self-efficacy beliefs, as presented in our theoretical model (Fig. 1). The results of this study provide evidence for the hypothesis that Bachelor degree nurses have higher critical thinking abilities. This

study did not provide evidence for the hypothesis that higher critical thinking abilities are positively related to self-efficacy beliefs. As illustrated in Fig. 2, only the WGCTA subscale "conclusions" relate positively to self-efficacy. It is not clear why other subscales do not show a positive relationship. Further testing of the model shows that there is no significant difference in scores on self-efficacy and perceived performance between Bachelor degree and diploma nurses. Other variables, such as years in function, seem to have greater influence on self-efficacy beliefs than solely critical thinking abilities do. We expected that the combination of higher critical thinking skills and years of experience/years in function would show positive correlations with self-efficacy beliefs. However, no significant differences were found between the two groups in mean years of experience and years in function. Although all respondents were staff nurses, differences in for example workplace culture could bias the results of this study. White (2009) conducted a concept analysis on self-confidence. She states that the building of confidence also relies on collegial support or self-encouragement. Hence, contextual and personal characteristics could act as factors in the formation of self-efficacy beliefs. This study did not include a detailed description of work place characteristics.

As mentioned above, results of this study show higher critical thinking skills among Bachelor degree nurses. This is consistent with earlier research findings (Beeken, 1997; Howenstein et al., 1996). Research focusing on the development of critical thinking skills after graduation could provide more detailed insight into the relationship between educational levels and scores on critical thinking. Specific strategies to help develop and evaluate essential critical thinking skills are necessary (Fero et al., 2009).

An issue in this study is whether participants might over- or underestimate their capabilities, based on their beliefs. Can individuals estimate accurately what it takes to fulfil a certain task to professional standards? Truxillo et al. (2008) found that those with higher thinking skills showed a more accurate estimate of their performance. According to Facione (1990), ideal critical thinking characteristics are for example fair-mindedness in evaluations, diligence in seeking relevant information, and reasonableness in the selection of criteria. It might be possible that those with higher (critical) thinking skills set higher standards or are more demanding. Hence, those with higher critical thinking skills might underestimate their capabilities based on their self-efficacy beliefs. Conversely, it might be so that those with lower thinking skills overestimate their capabilities based on their self-efficacy beliefs. Dunn et al. (2007) refer to evidence supporting this kind of relationship. Another issue is the complexity of tasks. The more complex a task is, the greater the demand on behaviour and information processing will be (Chen et al., 2001). The question is whether nurses with a Bachelor degree generally attend to more multidimensional and complex tasks than diploma nurses do. In mental health care in the Netherlands, it is known that the allocation of duties to Bachelor degree nurses and diploma nurses is poorly differentiated (Van der Windt et al., 2003; VBOC, 2006; V&VN, 2012). In many cases, it is not made explicit how educational levels should relate to domains and tasks of nursing. It is therefore quite possible that a Bachelor degree nurse does the same as a diploma

**Table 1**  
Anova, means and significance between and within groups (n = 95).

		Sum of squares	df	Mean square	F	Sig.
Years of experience	Between groups	94.907	1	94.907	0.799	0.374
	Within groups	11042.225	93	118.734		
	Total	11137.132	94			
Years in function	Between groups	65.020	1	65.020	0.978	0.325
	Within groups	6182.506	93	66.479		
	Total	6247.526	94			
Date of diploma	Between groups	88806.040	1	88806.040	1.161	0.284
	Within groups	7116492.845	93	76521.428		
	Total	7205298.884	94			

**Table 2**

Group statistics and t-values for scores on critical thinking (Watson Glaser subscales and overall), self-efficacy and perceived performance.

		N	Range	Mean	SD	Std. error mean	t	p
WG assumptions	MBO*	62	4–12	7.92	2.098	0.266	−4.893	0.000
	HBO**	33	5–12	9.76	1.521	0.265		
WG deductions	MBO	62	5–12	8.55	2.038	0.259	−2.398	0.019
	HBO	33	6–12	9.48	1.679	0.292		
WG interpretations	MBO	62	3–12	8.97	1.679	0.213	−1.910	0.060
	HBO	33	7–12	9.61	1.478	0.257		
WG evaluations	MBO	62	2–12	8.79	2.219	0.282	0.715	0.477
	HBO	33	6–12	9.09	1.792	0.312		
WG conclusions	MBO	62	2–12	5.92	2.106	0.267	−2.531	0.014
	HBO	33	4–11	7.09	2.170	0.378		
WG overall	MBO	62	25–60	40.15	6.412	0.814	−3.770	0.000
	HBO	33	36–56	45.03	5.791	1.008		
Self-efficacy	MBO	62	3.25–4.75	3.9839	.41209	0.05234	−1.287	0.204
	HBO	33	3.25–4.75	4.1212	.53444	0.09303		
Perc. performance	MBO	62	3.2–5.0	4.1968	.41842	0.05314	−1.062	0.292
	HBO	33	3.2–4.8	4.2970	.44755	0.07791		

\* MBO = group diploma nurses.

\*\* HBO = group bachelor degree nurses.

**Table 3**

Pearson correlations of the study variables (n = 95).

	1	2	3	4	5	6	7	8	9	10
1. Years of experience										
Pearson's correlation										
2. Years in function										
Pearson's correlation	0.617**									
3. MBO/HBO (educ. level)										
Pearson's correlation	−0.092	−0.102								
4. WG assumptions										
Pearson's correlation	−0.010	0.001	0.419**							
5. WG deductions										
Pearson's correlation	0.056	−0.052	0.228*	0.332**						
6. WG interpretations										
Pearson's correlation	0.099	−0.017	0.187	0.217*	0.333**					
7. WG evaluations										
Pearson's correlation	0.044	−0.074	0.069	0.277**	0.341**	0.238*				
8. WG conclusions										
Pearson's correlation	0.161	0.035	0.256*	0.318**	0.331**	0.405**	0.183			
9. WG overall										
Pearson's correlation	0.106	−0.031	0.354**	0.664**	0.703**	0.625**	0.624**	0.690**		
10. Self-efficacy										
Pearson's correlation	0.277**	0.297**	0.143	0.119	0.128	0.020	−0.041	0.232*	0.145	
11. Perceived performance										
Pearson's correlation	0.136	0.064	0.112	0.129	−0.003	−0.006	−0.061	0.107	0.055	0.321**

\*  $p < 0.05$ ; Pearson Correlations are reported at the diagonal.\*\*  $p < 0.01$ .

nurse and vice versa. This could explain the weak relationship between level of education and scores on self-efficacy beliefs.

The relatively low response rate could be due to circumstances: nurses work different shifts, participation was time consuming, and it did not always suit their busy schedules. A number of participants did not manage to complete the questionnaire within the time of the meeting. They could return their questionnaire by regular mail. Unfortunately, not all respondents returned their questionnaire.

Although some authors (e.g. Kuiper and Pesut, 2004) claim that there is no evidence that critical thinking outcomes can be explained solely by scores on standardised test such as the WGCTA, it is one of the few validated and tested instruments available in the Netherlands to measure critical thinking abilities.

## Conclusions

The present study shows that there is a positive relationship between educational level and the level of critical thinking. This corroborates

previous findings that higher nursing educational programmes contribute to the development of critical thinking abilities and therefore can be learned. Our findings show that self-efficacy beliefs are related to work experience rather than to educational level. Further research should be performed to determine the role of critical thinking skills in the formation of self-efficacy beliefs. It should specifically be investigated how higher critical thinking skills, combined with experience, can lead to higher self-efficacy beliefs.

We believe that insight into the relationship between critical thinking skills and self-efficacy beliefs supports staff development. This has implications for professional development in nursing. To date, critical thinking skills are often linked to clinical decision making. Learning how to apply these skills to determine self-efficacy can yield vital information. It is helpful to know how nurses rate their performance, and on what grounds. If such evaluations are made accurately, they can provide a solid basis for career competence. Training programmes can then be developed and applied to guide individual and professional development, facilitating the development

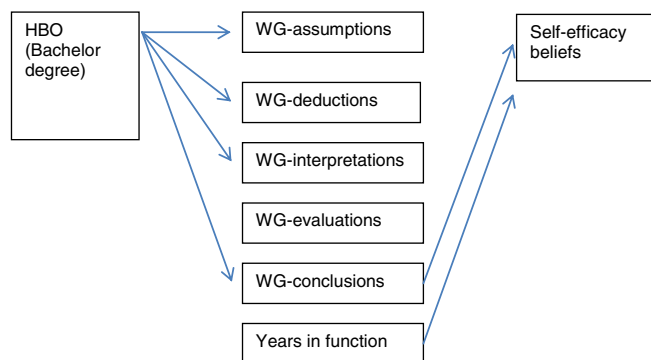


Fig. 2. Significant relationships educational level, critical thinking and self-efficacy.

of competences and the differentiation of tasks. This can contribute significantly to positioning diploma and Bachelor degree nurses in the Netherlands and elsewhere.

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There were no patients involved in the study. Informed consent was obtained from participants (nurses).

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