

Translation, Adaptation and  
Psychometric Testing of Nurses'  
Attitudes towards and Awareness of  
Research and Development in Nursing  
for use in Indonesian Primary Health  
Care Settings

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# Signed Statement

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I declare that this thesis presents work carried out by myself and contains no material that previously has been submitted for the award of any other degree or diploma in any university. To the best of my knowledge and belief, this thesis does not contain any materials previously published or written by another person except where due reference has been made in the text.

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November 2013

Kurnia Rachmawati

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# Abstract

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**Aim:** This study describes the Indonesian translation and adaptation process of the instrument *Nurses' attitudes towards and awareness of research and development within nursing (ATRAD-N) version II*, and psychometric testing of the translated instrument.

**Background:** The literature review presented herein highlighted the importance of understanding the attitudes of nurses towards research and research utilisation. This will enable us to understand the factors influencing use of research in nursing and the aspects that facilitate nurses to participate in research to improve nursing care. However, in the context of Indonesian primary health care services, nursing research and research utilisation has only recently been recognized as important and hence there is little or no relevant published research. In order to conduct such research, it is imperative to have a reliable and valid instrument that can be used in the context of Indonesian primary health care settings.

**Method:** The translation process was conducted systematically by applying the forward and back-translation method. Adaptation and content validity was assessed by inviting six experts from universities in Indonesia to review the relevance of the instrument in the context of Indonesian primary health care nursing. The psychometric testing was performed using construct validity (factor analysis) and homogeneity reliability tests (Cronbach's alpha coefficient) on a sample of 92 primary health care nurses from nine public health centres (*Pusat Kesehatan Masyarakat*) in the city of Banjarbaru and Banjarmasin, South Kalimantan, Indonesia.

**Results:** During the adaptation and content validity process, some changes were made to the instrument. The revised instrument showed acceptable content validity with an overall content validity index of 0.97. The factor analysis used principal component analysis with direct oblimin rotation. A five-factor structure was obtained that differed from those identified in previous studies. Seven items of the instrument did not load to any of the identified factors. The cumulative percentage of variance was 56.5%. The Cronbach's alpha coefficient for individual factors of the instrument ranged from 0.719 to 0.884, suggesting good internal consistency.

**Conclusion:** After the translation, adaptation and psychometric test process, the resulting form of the Indonesian translation of the instrument was found to be content valid and homogeneity reliable but not construct valid, in Indonesian settings. Further development, refinement and retesting would be essential to produce a psychometrically sound instrument.

# Chapter 1 – Introduction

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## Introduction

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The importance of basing health care services and service delivery on scientific evidence is increasingly being recognised (DiCenso, Ciliska & Guyatt 2005). The safe, effective and efficient delivery of quality care is critical in both developed and developing countries (Dalheim et al. 2012; Minas & Jorm 2010; Schneider 2013; Shifaza et al. 2013; Wallin et al. 2011). Health care professionals, including nurses, are encouraged to use the best available evidence, the most current clinical knowledge and the most relevant information to guide their clinical practice (Pearson, Field & Jordan 2007; Rice 2011). Thus, research plays an essential role in strengthening nursing services and delivery of nursing care.

This thesis reports on a research study designed to investigate a process of translation, adaptation and psychometric testing of a questionnaire to measure Indonesian nurses' attitudes towards research and research utilisation. The questionnaire, entitled *Nurses' attitudes towards and awareness of research and development within nursing version II* (hereafter referred to as ATRAD-N) was translated, adapted and tested for use by nurses in primary health care settings in Indonesia.

This chapter introduces and briefly outlines the background, importance and context of the study.

## Background

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Nursing research is a growing and changing discipline (Schneider 2013) in which nurses are encouraged to participate. Efforts in past decades have been directed towards the development and enhancement of nursing research to enable nurses with varying education levels and backgrounds to undertake nursing research (Chan et al. 2010; Edwards & MacDonald 2009; Jamerson & Vermeersch 2012; O'Byrne & Smith 2011). Nurses with higher research degrees are now active members of research teams with abilities to appraise, design and undertake independent primary research (Schneider 2013).

Research utilisation, the use of research evidence to inform practice, has become a main concern in nursing practice as the evidence-based practice movement extends from a focus of *what is evidence, and how can it be summarised* to *how can evidence be used to inform*

*daily clinical practice* (Estabrooks, CA, Wallin & Milner 2003; Estabrooks, CA 2009; Schneider 2013). All nurses, even those in rural areas, should be able to use scientific evidence to guide their practice (Olade 2004). However, research utilisation is a complex process that requires synergistic efforts to be successfully implemented (Mehrdad, Salsali & Kazemnejad 2008). Estabrooks, CA (2009) outlined several determinants influencing research utilisation: individuals, organisation and innovation (Estabrooks, CA 2009). In the case of individual determinants, Estabrooks, CA (2009) highlights a positive attitude to research as particularly influential in research utilisation.

### **Context of the study**

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Indonesia is a developing country situated in Southeast Asia, categorised as a lower middle income country by the World Bank (The World Bank 2013). Indonesia is heavily populated, with a current estimated human population of 240 million (Statistics Indonesia 2010). The Indonesian health care system employs approximately 20 nurses per 10,000 people. Nurses represent the majority of health care providers (Rokx et al. 2009; World Health Organization (WHO) 2012). Nurses in Indonesia provide nursing care in both hospital and community settings (Rokx et al. 2009; Shields & Hartati 2003).

### **Indonesian primary health care settings**

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The primary health care system in Indonesia is represented by *Pusat Kesehatan Masyarakat* (PUSKESMAS) (public health centres) as the functional health organisation unit (Abdullah et al. 2012). PUSKESMAS are front line health service institutions that have responsibility for providing comprehensive and integrated services to the community (Ministry of Health-Republic of Indonesia 2012). Public health centres have an important role in community development because they enable communities to use locally available resources for the benefit of health (Department of Health-Government of Indonesia 1990). In collaboration with other related sectors, the centres implement national and regional health programmes, including those dealing with health promotion, illness prevention, treatment of diseases and rehabilitation to all community groups (Department of Health-Government of Indonesia 1990; Ministry of Health-Republic of Indonesia 2012).

With only around 2% of the gross national product being expended on health care services (Hopkins 2006), the Indonesian health care system is extensively delivered through primary health care (Hennessy, Deborah et al. 2006). The government of Indonesia has increased the budget allocation for primary health care services as a response to problems currently

faced by the national health system (Ministry of Health-Republic of Indonesia 2011, 2012). Nurses are the main health care professionals and they carry out most of the national health programmes at the PUSKESMAS (Assan et al. 2009; Hennessy, Deborah et al. 2006). Therefore, primary health care nurses have a crucial responsibility for managing the delivery of safe and effective health programmes in Indonesia (Hennessy, Deborah et al. 2006).

### **Nursing education in Indonesia**

Nurses in Indonesia vary in the level of education they have attained, which may include *Sekolah Perawat Kesehatan* (School of Nursing at high school level), a Diploma Degree in Nursing or Bachelor Degree in Nursing (School of Nursing at university level) (Rokx et al. 2009). There is limited published data on the current level of nurses' education in Indonesia. In early 2000, only around 1% of nurses in Indonesia were educated at the university level (Hennessy, D, Hicks & Kawonal 2005). The majority (60%) of nurses at the time were educated at the senior high school level, while the others (39%) were educated at the diploma level (Hennessy, D, Hicks & Kawonal 2005). The educational level of Indonesian nurses is still far behind that of other health professionals such as physicians and dentists (Rokx et al. 2009). However, the Indonesian government has sought to improve the quality, standard and level of nursing education by opening more Schools of Nursing at university level (Indonesian National Nurses Association 2009; Shields & Hartati 2003).

The government expects professional nurses to be educated at the bachelor's degree level and vocational nurses, at least to the diploma level (Indonesian National Nurses Association 2009). It is expected that the quality of nursing education will increase as more nurses pursue masters and doctoral degrees in nursing (Indonesian National Nurses Association 2009; Shields & Hartati 2003). Nurses, especially nursing academic faculty members, are increasingly undertaking university studies, both locally and internationally (Shields & Hartati 2003).

### **Nursing research in Indonesia**

Research utilisation is a new concept in Indonesian nursing and research modules have recently been added to the nursing curriculum (Indonesian National Nurses Association 2005). However, its development is still in its infancy. As a result, the implementation of evidence-based practice is complex and difficult for Indonesian nurses. As in other

developing countries, a number of factors contribute to this situation (Mehrdad, Salsali & Kazemnejad 2008; Tsai 2000). Poor quality of education and lack of strategies to enhance the use of research findings are two common barriers in research utilisation and research participation (McKenna, Ashton & Keeney 2004; Oh 2008; Tsai 2000). As a result, nursing in Indonesia may still be a long way from both utilising research findings in practice and undertaking nursing research.

There are few publicly available data that can be used to inform nursing research, research utilisation, or even nurses' attitudes towards research and research utilisation in Indonesia. As explained by Estabrooks, CA (2009), attitudes are a significant factor influencing research utilisation. (Estabrooks, CA 2009). Roxburgh (2006) and Ulrich et al. (2012) also consider that positive attitudes facilitate nurses' participation in research. These studies demonstrate a supportive link between attitudes towards research, and research utilisation and participation.

The context and situation presented above indicate the importance of carrying out a study to assess the attitudes of Indonesian nurses towards nursing research and the utilisation of research to guide their practice. Such a study will enable us to understand the factors that influence nursing research utilisation in Indonesian primary health care settings and facilitate Indonesian nurses to participate in research. This research requires a reliable and valid instrument to measure the variable of interest—attitudes towards research and research utilisation—in the context of Indonesian primary health care settings.

### **Purpose of the study**

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The purpose of this study is to translate, adapt and test an instrument designed to measure nurses' attitudes towards research and research utilisation. The ATRAD-N was developed in health care settings in Sweden, where it has been validated for use with primary health care nurses. The instrument has been translated into English and found to be valid and reliable (Bjorkstrom & Hamrin 2001; Nilsson Kajermo, Alinaghizadeh, Falk, Wändell, et al. 2013). However, the instrument has not been translated into Indonesian or tested in Indonesian primary health care settings. Given differences in geography, culture, situations and context, it seems likely that some adaptation of the instrument will be required. Therefore, the present study sought to determine if the ATRAD-N is valid and reliable to measure primary health care nurses' attitudes towards nursing research and research utilisation in Indonesia.

## **Statement of the research problem**

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The psychometric properties of the translated instrument must be measured to justify its use. Previous research on psychometric properties of the ATRAD-N has consistently shown the instrument to be valid and reliable (Bjorkstrom & Hamrin 2001; Nilsson Kajermo, Alinaghizadeh, Falk, Wandell, et al. 2013). However, given differences in health care systems and funding models between developing countries such as Indonesia and developed countries such as Sweden, it may be that adaptation and psychometric testing of the instrument for use in Indonesian primary health care settings would not mirror Swedish findings (Bjorkstrom et al. (2003); Nilsson Kajermo, Alinaghizadeh, Falk, Wändell, et al. (2013),b). Therefore, the alternative hypothesis ( $H_A$ ) in the current study was that there would be a difference in psychometric properties of the ATRAD-N between the primary language and the target language (Indonesian). The null hypothesis ( $H_0$ ) was that there would be no difference in psychometric properties of the ATRAD-N between the primary language and the target language (Indonesian).

## **Aims and objectives**

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The overall objective of this research was to provide a valid and reliable instrument to measure primary health care nurses' attitudes towards nursing research and research utilisation in Indonesia. The specific objectives of the study were to:

- translate a previously developed questionnaire, ATRAD-N, from the source language (English) to the target language (Indonesian)
- evaluate and adapt the questionnaire in terms of items, instruction for administration and scoring rules
- estimate the content and construct validity of the translated questionnaire
- estimate the homogeneity reliability of the translated questionnaire.

## **Significance of the study**

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The main benefit of this research is provision of a reliable and valid instrument that can be used in Indonesia to explore primary health care nurses' attitudes towards research and research utilisation. Validating this adapted questionnaire will lead to a tool that can be used to provide information for health officials and nursing educators to develop strategies facilitating nurses' use and conduct of research to improve patient care.

## Definition of terms

Terms used extensively in this study are defined in Table 1.

**Table 1** Definition of terms

<i>Term</i>	<i>Definition</i>
Attitudes	An inclination to respond positively or negatively to a person, thing, idea or event. Attitudes are beliefs that could guide decisions and behaviour (Eagly 2007).
Instrument/measure	A tool that enables measurement of research variables (Gillespie & Chaboyer 2013). For example, the form of the instrument or measure might be a survey, questionnaire, laboratory test or equipment (Gillespie & Chaboyer 2013).
Nursing research	Research carried out by nurses (Bäck-Pettersson et al. 2013; Schneider 2013). It is used to scientifically build a foundation for nursing practice (Bäck-Pettersson et al. 2013; Jeffs et al. 2006; Jeffs et al. 2009; Schneider 2013).
Psychometric testing	Aspects of testing/assessment of measurement instruments (DeVon et al. 2007), including reliability, validity and responsiveness (Gillespie & Chaboyer 2013). Psychometric testing has been used to determine the quality and accuracy of instruments in relation to their ability to assess the construct under study (Marshall, Andrea P. et al. 2007; Sireci & Parker 2006).
Reliability	The consistency of a research instrument in relation to its ability to measure the target attributes (DeVon et al. 2007; Gillespie & Chaboyer 2013). An instrument has good reliability when it produces the same results over the period of repeated measurements in the hands of different scorers (DeVon et al. 2007; Goodwin 2001; LeBreton & Senter 2008; TOPF 1986).

<i>Term</i>	<i>Definition</i>
	Reliability has three major attributes: stability, homogeneity and equivalence (Gillespie & Chaboyer 2013). It also has different tests depending on the purposes and format of the instrument (Gillespie & Chaboyer 2013).
Research utilisation	The process of translating research findings into practice (Estabrooks, CA 1999a; Estabrooks, CA et al. 2003; Estabrooks, CA 2009; Milner, Estabrooks & Humphrey 2005). This term has a similar meaning to other terms, such as research implementation, knowledge translation or knowledge utilisation (Estabrooks, CA 1999a, 1999b; Milner, Estabrooks & Humphrey 2005).
Validity	The accuracy of a research instrument in relation to its ability to measure all aspects of the construct being investigated (DeVon et al. 2007; Gillespie & Chaboyer 2013). Validity has three different aspects: content, construct and criterion (Gillespie & Chaboyer 2013). Like reliability, it has different tests depending on the purposes and format of the instrument (Gillespie & Chaboyer 2013).



## **Summary of the thesis**

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This thesis provides a comprehensive report of the study conducted, and consists of five chapters. This introductory chapter lays the foundation for the study and outlines the research questions that were addressed. The literature review in Chapter 2 examines the relationship of this study to previous work and provides an empirical basis for the research questions addressed. Chapter 3 describes the methods and choice of data analysis. Chapter 4 details the results of the data analysis and Chapter 5 presents a discussion of the major findings of the study, their significance to nursing practice, and recommendations for further research.

## **Conclusion**

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It has been recognised that nursing research and research utilisation are important to develop nursing practice. However, in the context of Indonesian primary health care settings, nursing research and research utilisation is still considered a new concept and there is little or no published evidence around it. It is important to carry out a study to assess the attitudes of Indonesian primary health care nurses towards research as well as their participation in undertaking research and utilising research results to guide their practice. Such a study requires a reliable and valid instrument to measure the components of interest. This study describes the translation and adaptation process of the ATRAD-N instrument, and psychometric testing of the translated instrument.

# Chapter 2 – Literature Review

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## **Introduction**

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This chapter explores contemporary issues from the literature surrounding nurses' attitudes towards research and research utilisation measures, and the psychometric properties of a valid and reliable instrument. It begins by reviewing the current available instruments designed to measure these attitudes. This is followed by an explanation of the methodological approach of translating and adapting an instrument. The next area to be explored is the psychometric properties that should be assessed to ensure that instruments are valid and reliable. Each area is reviewed separately and data are then summarised to determine the implications of the research.

The literature review was undertaken using the following databases: Cumulative Index of Nursing and Allied Health Literature, MedLine/Pubmed and Scopus. The search strategy used the initial terms 'translation' linked to 'adaptation', and 'psychometric testing/properties' linked to 'reliability' and 'validity'. Subsequently, research utilisation measures used in nursing—'research utilisation', 'research implementation' and 'instrument or measures'—were searched separately. The articles included in this literature review were published from 1990–2013. Only English language journals were reviewed, due to limited translation facilities.

## **Self-report research utilisation instruments used in nursing**

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Research utilisation is 'the use of research to guide practice' (Estabrooks 2009). It has been discussed in nursing since the 1970s (Estabrooks 2009) and is recognised as a way to guide nursing practice based on the best available evidence for the benefits of patient care (Champion & Leach 1989; Estabrooks 1998).

It is important to assess research utilisation in nursing practice using a valid and reliable instrument (Frasure, J 2008; Squires, Janet et al. 2011). Such assessment enables a better understanding of the underlying construct and concept, related factors and outcomes of research utilisation (Estabrooks, CA et al. 2003; Estabrooks, CA 2009). In nursing practice, assessment of research utilisation will also influence the development of further interventions to improve patient care (Estabrooks, CA 1999a).

The importance of research utilisation has encouraged the development of valid and reliable measures to assess either its outcomes or related factors (Frasure, J. 2008; Squires, J, Adachi & Estabrooks 2008). Ideally, such instruments should be designed using strong theoretical concepts and psychometric properties (Squires, J, Adachi & Estabrooks 2008). Before an instrument can be used to measure and assess research utilisation in practice, it should be empirically tested (Squires, Janet et al. 2011). Therefore, it is essential to critically analyse the psychometric properties of available instruments (Estabrooks, C & Wallin 2004).

A systematic review was conducted by Frasure, J. (2008) to analyse instruments used to measure the individual factors associated with research utilisation. The review included studies that explained the development of the instruments and their underlying concepts and psychometric properties. Twenty-five instruments met the inclusion criteria for that review, but only 14 were incorporated into the analysis due to incomplete reports in the other 11 studies. The review ranked the instruments based on the strength of their reliability, and discussed the sample size that was used to test the instruments, the scoring methods and the instruments themselves. The Research Utilisation in Nursing Survey developed by Estabrooks and adapted by Kenny (2005) had the strongest reliability (Frasure, J. (2008). It was followed by the Finnish Nurses' Attitudes towards Nursing Research questionnaire (Kuuppelomaki and Tuomi (2005), the Nursing Research Utilisation Survey (Olade (2003) and the Swedish Nurses' Attitudes towards Research and Development questionnaire (Bjorkstrom and Hamrin (2001). Although the review provided a useful summary of the state of development of instruments measuring nurses' attitudes towards research utilisation, it did not discuss the settings in which the instruments were used.

Another systematic review was conducted by Squires, Janet et al. (2011) to analyse self-report instruments used to measure research utilisation in health care. Unlike the review of Frasure (2008), it focused on studies that addressed the measurement of research utilisation *per se*, and aimed to assess the psychometric properties of research utilisation measures used in health care. The review identified 60 self-report research utilisation studies and grouped them into three hierarchical levels based on the strength of their psychometric properties. The review concluded that measurements in the field of research utilisation are underdeveloped due to substantial psychometric issues with those measures.

The extensive development of research utilisation and factors associated with its measurement illustrate the importance of having a valid and reliable measure (Estabrooks, C & Wallin 2004; Squires, J, Adachi & Estabrooks 2008). As health care professionals assume that research utilisation has a positive effect on health care practice by promoting high-quality practices, the use of valid and reliable research utilisation measures should be extensively promoted (Estabrooks, C & Wallin 2004).

### **Translation and cultural adaptation of instruments**

Cultural and language diversity worldwide has raised expectations for cross-cultural health research (Beaton et al. 2000; Sidani et al. 2010). In the context of enabling the uptake of research findings into health care practice, there are two major reasons why cross-cultural health research is important. First, the results of studies from other cultures or languages could have significant clinical relevance for health care professionals providing services in those populations (Sousa & Rojjanasrirat 2011). Second, such results may be able to be extrapolated to other populations (Sousa & Rojjanasrirat 2011; Sousa et al. 2005).

In order to promote cross-cultural health care research, it is important to provide access to research instruments that are not only valid and reliable but have been adapted into various languages for use in other cultures (McDermott & Palchanes 1994; Sperber 2004). This is because the quality of health care research very often depends on the quality of instruments used to collect the data (Gillespie & Chaboyer 2013). Thus, health care researchers should ensure they use an instrument that has been validated across cultures (Uysal-Bozkir, Parlevliet & de Rooij 2013).

Efforts have been made to establish a standardised methodological approach for translating and adapting instruments intended for cross-cultural health care research. For example, Sousa and Rojjanasrirat (2011) presented translation and cross-cultural adaptation guidelines for health care research based on a review of previous studies. They recommended seven consecutive steps for the translation and adaptation process, including a cross-validating step that requires researchers to carry out pilot testing of the translated instrument before it is used in the actual population. These guidelines underline the importance of an expert panel as a step to evaluate context relevance or equivalence of a translated instrument. The guidelines also propose the use of full psychometric testing of the translated instrument in the targeted population to estimate some psychometric

properties, including internal consistency as a reliability test and factor analysis as a construct validity test.

Other guidelines for translating and adapting instruments were established by Gudmundsson (2009) based on the International Test Commission guidelines for adaptation of instruments. The guidelines proposed eight steps, focusing on translation and adaptation of an instrument for use in countries or cultures other than those for which the original instrument was developed. For the translation process, the authors suggested two approaches: the back-translation and independent translation methods. Each of these methods has strengths and weaknesses. As in other guidelines, the authors emphasise the adaptation process should involve a panel of experts to assess content and construct clarity as well as the relevance of the translated instrument. The last step of the translation and adaptation process in these guidelines is to conduct a piloting and validity study in which a translated and adapted instrument is used to undertake psychometric tests in the target language before it is used in the actual study.

Various studies have also described the methodology of translating and adapting instruments (Beaton et al. 2000; McDermott & Palchanes 1994; Sperber 2004; Wild et al. 2005), and all propose different approaches. Therefore, an analytical approach should be considered before choosing one method (Sousa & Rojjanasrirat 2011). The process of translating and adapting instruments should not focus solely on translation (Uysal-Bozkir, Parlevliet & de Rooij 2013), but should be sufficiently comprehensive to include a complete evaluation of the translation and cross-cultural adaptation process (Sousa & Rojjanasrirat 2011).

### **Psychometric properties of translated instruments**

Gudmundsson (2009) and Sidani et al. (2010) subscribe to the belief that a translated instrument should not be assumed to have the same psychometric properties as the source language and that the quality of a translated instrument can only be proven by empirical tests in the target language. Thus, assessments of the psychometric properties of the translated instrument should be performed. Generally, the two psychometric properties that need to be investigated are validity and reliability of the instrument (DeVon et al. 2007; Gillespie & Chaboyer 2013).

Validity refers to the accuracy of a research instrument in relation to its ability to measure all aspects of the construct being investigated (DeVon et al. 2007; Gillespie & Chaboyer 2013). There are three aspects to validity: content, construct and criterion (Gillespie & Chaboyer 2013). Validity of an instrument can be measured using different tests depending on the purposes and format of the instrument (Gillespie & Chaboyer 2013). Reliability refers to the consistency of a research instrument in relation to its ability to measure the target attributes (DeVon et al. 2007; Gillespie & Chaboyer 2013). An instrument has good reliability when it produces the same results over the period of repeated measurements between scorers (DeVon et al. 2007; Goodwin 2001; LeBreton & Senter 2008; TOPF 1986). Reliability has three major components: stability, homogeneity and equivalence (Gillespie & Chaboyer 2013). There are different tests of reliability depending on the purposes and format of the instrument (Gillespie & Chaboyer 2013).

Normally, several series of validity and reliability tests of a translated instrument should be undertaken. There is no agreement on how these tests should be performed (Gillespie & Chaboyer 2013) but several studies recommend common psychometric tests for this purpose (Chaboyer et al. 2012; Gudmundsson 2009; Lynn 1986; Nilsson Kajermo, Böe, et al. 2013; Sidani et al. 2010; Sousa & Rojjanasrirat 2011). Factor analysis, content validity and internal consistency are among those psychometric properties recommended for assessment in a translated instrument (Sousa & Rojjanasrirat 2011). Both validity and reliability tests of a translated instrument should be undertaken in the target language to be used ultimately for collection of the data (DeVon et al. 2007; Gudmundsson 2009). The respondents in the validity tests should have the same characteristics as those in the applied context (DeVon et al. 2007; Gudmundsson 2009).

## **Conclusion**

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This chapter has explored contemporary issues surrounding instruments to measure nurses' attitudes towards research and research utilisation as well as the psychometric properties of a valid and reliable instrument, particularly with regard to translation of an instrument from one culture to another. This review has highlighted the importance of having a valid and reliable instrument to measure nurses' attitudes towards research and research utilisation. This could be achieved by either designing a new valid and reliable instrument or translating and adapting a current one. There are several guidelines that could be followed in order to translate and adapt an instrument. Even if an instrument has

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good psychometric properties, it is necessary to re-assess its validity and reliability following translation.

This literature review has identified the crucial points that should be described in this study in order to translate, adapt and psychometrically test an instrument to measure nurses' attitudes towards research and research utilisation. The next chapter will outline the methods of the study, including research design, respondents, chosen instruments, ethical considerations, data collection and data analysis.

# Chapter 3 – Research Design

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## Introduction

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This chapter focuses on the framework underpinning the conduct of the current research, which aimed to investigate a process of translation, adaptation and psychometric testing of a questionnaire to measure nurses' attitudes towards research and research utilisation in nursing practice. A description of the study design and choice of instrument used in this study is followed by an explanation of participant recruitment, inclusion and exclusion criteria, ethical considerations, data management and the statistical analysis conducted to determine the validity and reliability of the instrument.

## Research design

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### Translation method

The translation process was conducted systematically by applying the forward and back-translation method. Prior to this, a critical examination of the available instruments was carried out using a panel of two experts from the School of Nursing at The University of Adelaide, Australia. The translation was conducted via the following steps:

1. Selection of an instrument for translation

After critically reviewing available instruments to measure nurses' attitudes towards research and research utilisation, the ATRAD-N was chosen. The selection process included consideration of the psychometric properties of the original instrument, and its applied utility.

2. Permission from the originators of the instrument

Permission to use ATRAD-N was sought and obtained from the originators of the instrument (Monica Björkström and Elisabeth Hamrin) prior to the translation process.

3. Translation of the instrument

Two bilingual translators whose first language is Indonesian independently translated the questionnaire from English to Indonesian.

4. Compilation of a single translated version



The research team worked with one of the translators used in the previous step to compare the two translated versions and compile a preliminary initial translation of the questionnaire. The compilation process considered the meaning and understanding of words and sentences.

5. Blind back-translation of the questionnaire

A third bilingual translator, whose first language is English, back-translated the preliminary initial translation from Indonesian to English. This translator was blind to the original questionnaire and had never identified it.

6. Review and comparison of the back-translated instrument

The research team compared the original and blind back-translated versions of the questionnaire. This process involved evaluating linguistic unity between the two versions (the extent to which the meaning of the items is equivalent) and relevance of the items in the original questionnaire.

7. Development of a preliminary version of the questionnaire in Indonesian, based on the review process.

### **Adaptation method**

Following translation, the adaptation process evaluated and adapted the preliminary Indonesian version of the questionnaire in terms of the instructions, items and response format. In order to do this, six experts from various universities in Indonesia who have a background in community health nursing were contacted to request their knowledge and suggestions on an item-by-item basis. They simultaneously adapted the questionnaire based on local information, context, and the culture in which the instrument was to be applied. The outcome of the adaptation process was the development of a final version of the instrument in Indonesian.

Together with this adaptation process, a content analysis was performed in order to quantify the indicators of content appropriateness and relevance provided by the experts. In this process, the experts were asked to evaluate each item of the translated instrument for content-related validity using a scale. The content validity scale used in this study was developed by Lynn (1986), wherein experts rate each item on a four-point scale where 1 = not relevant, 2 = partly relevant with major alteration, 3 = relevant but need minor alteration and 4 = relevant and succinct.

The experts' endorsement was collected and the content validity index (CVI) score was estimated for individual scale items and the entire scale. The level of endorsement was set up to establish content validity. The CVI for an individual item is the proportion of experts that rate the item as 3 or 4 on the four-point scale. According to Lynn (1986), a cut-off point was used to identify the real versus the chance agreement between the experts. The number of experts who agree out of total number of experts used is calculated and then set the standard error of the proportion. For a panel of six experts, the level of endorsement required to retain an item based on the proportion of the experts would be a minimum of 0.83, at the 0.05 level of significance (Lynn 1986; Wynd, Schmidt & Schaefer 2003).

### **Psychometric testing**

After adaptation and content validity testing, the Indonesian translated instrument was ready for psychometric testing. The process of psychometric testing included validity and reliability tests. Construct validity testing was conducted using factor analysis to explore the factor structure of the instrument. Homogeneity reliability testing was conducted using Cronbach's alpha coefficient to determine internal consistency. Cronbach's alpha was calculated for individual factors and the entire scale.

### **Instrument**

The ATRAD-N was developed to study attitudes among professional nurses towards research and development in nursing (Björkström & Hamrin 2001). The original ATRAD-N was tested and validated in a main study in Swedish. The latest version was translated from Swedish to English and then validated in 2002. The originators designed the instrument based on a review of relevant literature and two previous studies conducted in Sweden. The items on the original questionnaire were constructed based on interviews with nurses.

The current ATRAD-N consists of 35 items including a Likert-type (1–5) scale with responses ranging from 'do not agree at all' (1) to 'agree to a very great extent' (5). In 2003, this instrument was used to investigate Swedish undergraduate nursing students' attitudes towards and awareness of research and development in nursing (Bjorkstrom et al. 2003). Then in 2004, the construct validity of the instrument was tested on a sample of undergraduate nursing students in Australia (Marshall, A. P. et al. 2007). In 2005, a slightly modified version of the instrument focusing on nurses in primary health care, was tested (Nilsson Kajermo, Alinaghizadeh, Falk, Wandell, et al. 2013). In all these tests, the instrument was found to have acceptable measures of reliability and validity.

In this study, the ATRAD-N with Likert-type (1–5) scale was selected because this questionnaire was found to be valid and reliable to measure nurses' attitudes towards research and research utilisation, and has recently been adapted for use in community nursing. Although the questionnaire has been used in various studies with different samples, it has never been translated and adapted, or tested for reliability and validity, in Indonesian health care settings. It is more time efficient and cost effective to translate, adapt and test an instrument that already has acceptable measures of reliability and validity and then use it in the target population, than it is to develop an entirely new instrument (Gillespie & Chaboyer 2013; Osborne & Schneider 2013).

### **Sample size estimation**

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To determine an adequate sample size considering the number of variables and the statistical techniques used to analyse the data, an estimation of sample size was made. In performing factor analysis DeVon et al. (2007) suggested five subjects per item of the instrument. With approximately 35 items in the questionnaire, a minimum of 175 subjects was considered adequate.

### **Subject selection**

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The subjects of the psychometric tests were recruited using the convenience sampling method, from nurses working in primary health care institutions or PUSKESMAS in the city of Banjarbaru and Banjarmasin, South Kalimantan, Indonesia. The settings were eight primary health care institutions in Banjarbaru and 26 health care institutions in Banjarmasin. There were approximately 173 primary health care nurses in Banjarmasin and 90 in Banjarbaru, and all 263 were invited to psychometrically test the instrument. The recruitment took place in July 2013.

### **Inclusion and exclusion criteria**

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Selection criteria included nurses with a minimum of one-year experience in primary health care settings. Nurses of all ages and educational background were invited to participate.

### **Ethical considerations**

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Permission for the translation, adaptation and psychometric testing of the questionnaire was obtained from one of the originators of the questionnaire, Monica E. Björkström from Karlstad University in Sweden (see Appendix 1).

The ethical consent required for this study was obtained from the Human Research Ethics Committee at The University of Adelaide (project number HS-2013-041, see Appendix 2). Permission to commence this study also was obtained from local institutions authorised to provide research permits (see Appendices 3 & 4). Other ethical considerations in the conduct of the study included:

- An information sheet (see Appendix 5)

The information sheet was given to potential participants prior to the study being conducted to explain the aims and purpose of the study as well as the data collection methods. Participants were informed about the nature of the study, what was required of them, that they were free to withdraw their participation at any time without prejudice, and that in this case, any provided information would be destroyed at their request. The respondent's willingness to complete the instrument was then taken as an indication of their consent.

- Non-disclosure of information and anonymity

The individual participants were unidentifiable in the reporting of this research. No participant information (e.g. name or location) was required for this research. The demographic data were grouped and aggregated to ensure anonymity.

- Data storage and confidentiality

All data collected, including hard copies of the questionnaire, were stored in a locked filing cabinet in the School of Nursing at The University of Adelaide. Electronic data were stored on a password-protected computer network, also in the School of Nursing. Only the researcher and the supervisors have access to the information, which will be kept for a period of five years.

## **Data analysis**

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### **Scoring**

Each item of the questionnaire had a corresponding five-point Likert scale. A higher total score indicated a more positive attitude towards research and research utilisation. Items included both positive and negative statements. These negatively phrased items were reverse scored.

### **Missing data**

Returned questionnaires with more than 10% unanswered items were excluded. For questionnaires with less than 10% of items unanswered, missing data were derived using mean estimation.

### **Statistical analysis**

All data were gathered using hard-copy questionnaires. The data were coded and entered into a Microsoft Excel spread sheet and then exported into the Statistical Package for the Social Sciences (SPSS) Version 20.0 for data cleaning, reverse scoring and further analysis.

### ***Factor analysis***

Exploratory factor analysis was performed using principal component analysis (PCA) in order to identify the factors that most accurately describe relationships among the variables. The factors obtained were then rotated using direct oblimin rotation. Significant factor loadings were identified using guidelines based on sample size (Hair et al. 1995). Criteria used in determining factor extraction (Hair et al. 1995; Kootstra 2004; Pallant 2011; Pett, Lackey & Sullivan 2003b; Williams, Brown & Onsman 2010) included the eigenvalue>1 rule, cumulative percentage of variance 50–60%, scree test and parallel analysis (Kootstra 2004).

### ***Internal consistency (reliability test)***

The internal consistency of the instrument was measured using Cronbach's alpha coefficient, comparing each item in the scale with all other items. A large alpha indicates strong correlation between items. A minimum score of 0.70 was set to ensure adequate reliability (Gillespie & Chaboyer 2013).

### ***Univariate analysis***

The demographic data were statistically analysed and tested to compare the mean scores in each and total factors using independent sample *t*-tests. The correlation between factors derived from the factor analysis was measured using the Spearman rank-order correlation.

### **Conclusion**

This chapter has provided an overview of the study design, participant recruitment, inclusion and exclusion criteria, and ethical considerations. It also detailed the data management and statistical analyses used in the study. The next chapter presents the findings from the data analysis.

# Chapter 4 – Results

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## **Introduction**

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The objectives of this study were to conduct a process of translation, adaptation and psychometric testing of a questionnaire (the ATRAD-N) to measure primary health care nurses' attitudes towards nursing research and research utilisation in Indonesia. The results of this process are presented in this chapter, in five sections: (i) translation of the instrument, (ii) adaptation and content validity assessment of the instrument. (iii) factor analysis in relation to the demographic profile of the respondents, (iv) homogeneity reliability test of internal consistency, and (v) univariate analysis of extracted factors and biographical data of the respondents. The findings are described with reference to the objectives of the study.

## **Translation process**

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Figure 1 illustrates the translation, adaptation and content validity process applied to the ATRAD-N. The English version of the instrument was translated into Indonesian following a forward and backward translation process involving two native Indonesian speakers (AF and HR) fluent in English (see Appendix 6 for their certification statements). Each produced an Indonesian translation, and the two versions were compared and discussed by the research team, who then compiled a preliminary initial translated version of the instrument.

A translator from the National Accreditation Authority for Translators and Interpreters (see Appendix 6) blindly back-translated the preliminary initial instrument into English. The blind back-translated version then was compared to the original English version by the research team. During this process, the translated questionnaire was also slightly modified to focus on Indonesian primary health care settings and nurses working in them. Items 36–39 were deleted because they are not relevant to Indonesian settings. Ten new items related to biographical details of the respondents were generated and added to the translated instrument. These included gender, age, level of education, work experience, access to the Internet and other sources of information to inform practice, and experience or education related to research.

Appendix 7 provides the original version of the instrument, and Appendix 8 compares the original and blind back-translated versions.

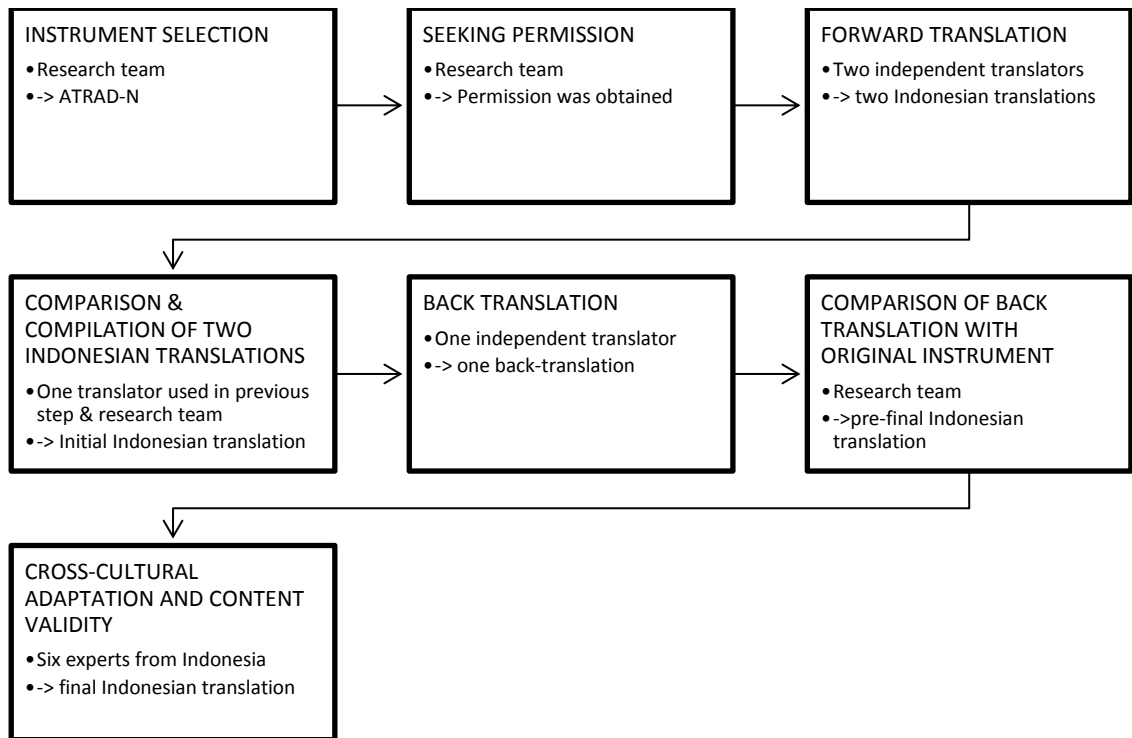


Figure 1 Translation, adaptation and content validity process of the ATRAD-N instrument

### Adaptation and content validity process

Six Indonesian university experts with community health nursing backgrounds were invited to evaluate each item of the preliminary version of the questionnaire in Indonesian for content-related validity and the relevance of each item for Indonesian primary health care settings. In order to determine content validity, the Lynn method of calculating the CVI was employed. A four-point scale was used for determining whether items should be retained or rejected. The CVI of each item was computed, and the level of significance set at 0.05. Items with the required minimum 0.83 level of endorsement were retained as valid items.

The instrument was designated as valid by the expert, with a CVI of 0.97 for the entire scale. Table 2 captures the CVI scores for each individual item, as well as the overall scores. One item, ‘nursing education programmes are too research based’ (see Table 1), was dropped because it did not achieve the 0.83 level of endorsement required to establish content validity. Thus, the final version of the instrument in Indonesian consisted of 34 items from the ATARD-N and 10 items relating to biographical details of respondents.

**Table 2 The content validity index (CVI) scores for each individual item and the overall scores**

No	Statement	RI#	CVI	Content evaluation
1	<b>Instructions:</b> The following pages have a number of questions which request your evaluation by indicating the level of agreement you choose. Circle the choice which most closely represents your opinion. 1= strongly disagree, 2= disagree, 3= somewhat agree, 4= agree, 5= strongly agree	6	1.000	valid
2	As a nurse, you must be able to read literature in English	5	0.833	valid
3	Participation in nurse development projects provides no benefit to nursing skills	6	1.000	valid
4	In the world of nursing, too much is written and there is too much discourse about research and development	6	1.000	valid
5	In my opinion it is interesting to read scientific articles about nursing	6	1.000	valid
6	The nursing profession does not need to be research knowledge based as same as in the medical profession	6	1.000	valid
7	The science of nursing and nursing research illustrates nursing matters and makes them clearly visible	6	1.000	valid
8	The profession of nursing is a practical profession and does not have to include research	6	1.000	valid
9	Research literature in nursing needs to be available in the workplace (e.g. in the ward)	6	1.000	valid
10	The language of scientific articles are too complex for me	6	1.000	valid
11	To be involved in nursing development projects is not important	6	1.000	valid
12	To be involved in nursing development projects should be part of a nurse's work	6	1.000	valid
13	We do not need nursing scientists to develop nursing care, nurses can carry out such matters themselves	6	1.000	valid
14	I am enthusiastic to attend international scientific conferences	5	0.833	valid
15	Nursing education programmes are too research based*	4	0.667	not valid*
16	Nursing research makes general nursing work too complicated	6	1.000	valid
17	Teachers in nursing education must become resources in the workplace in order to promotes nursing development	6	1.000	valid
18	Nursing research does not raise nursing professional status	6	1.000	valid
19	A doctor degree in nursing needs to be made a pre-condition to be appointed to certain senior positions in nursing	5	0.833	valid
20	Continued training in research and research based studies will not be important in the future	6	1.000	valid
21	My position as a nurse is already strong enough to influence nursing without having to have knowledge of research	6	1.000	valid
22	The language used in nursing research is too complicated	5	0.833	valid
23	We need to have more nurses with doctoral/masters education in clinical work	6	1.000	valid
24	To be involved in research does not result in a nurse having a better increased professional skill level	6	1.000	valid
25	Results of nursing research need to be more widely distributed to nurses in the workplace	6	1.000	valid
26	Nursing research is important for my self-development as a professional nurse	6	1.000	valid



No	Statement	RI#	CVI	Content evaluation
27	To believe that someone can apply research results in nursing practice is unrealistic	6	1.000	valid
28	To be involved in research is a part of the nursing occupation	6	1.000	valid
29	Nursing expertise is mainly achieved by long nursing practice	6	1.000	valid
30	I don't need to take the trouble to find out about research results	6	1.000	valid
31	Students in nursing programmes must become resources in the workplace in order to promote nursing development	6	1.000	valid
32	The nursing profession clearly must be based in scientific and reliable experience	6	1.000	valid
33	To devote oneself to nursing research is not worthwhile	6	1.000	valid
34	Nurses must provide time for reading research reports	6	1.000	valid
35	To introduce and test new ideas is extremely important in the world of nursing	6	1.000	valid
36	I think that the questions in this questionnaire are very important	6	1.000	valid
37	BIOGRAPHICAL DETAILS Instructions: Please tick (v) the appropriate boxes	6	1.000	valid
38	1. Sex <input type="checkbox"/> Male <input type="checkbox"/> Female	6	1.000	valid
39	2. Age (years old) <input type="checkbox"/> 20-30 <input type="checkbox"/> 31-40 <input type="checkbox"/> 41-50 <input type="checkbox"/> >50	6	1.000	valid
40	3. Highest level of education <input type="checkbox"/> SPK (vocational school) <input type="checkbox"/> D3 (diploma degree) <input type="checkbox"/> S1 (bachelor degree) <input type="checkbox"/> S2 (master degree)	6	1.000	valid
41	4. Years of nursing experience <input type="checkbox"/> < 1 <input type="checkbox"/> 2-5 <input type="checkbox"/> 6-10 <input type="checkbox"/> 11-15 <input type="checkbox"/> > 15	6	1.000	valid
42	5. Do you have access to the Internet at your workplace? <input type="checkbox"/> Yes (go to question no.4) <input type="checkbox"/> No (go to question no.5)	6	1.000	valid
43	6. What do you access on the Internet? (may answer more than 1 option) <input type="checkbox"/> Medical journals <input type="checkbox"/> Nursing journals <input type="checkbox"/> Government sites (Depkes RI, Dinkes daerah, dll) <input type="checkbox"/> Health organization sites (PPNI, IDI, IBI, AIPNI, dll) <input type="checkbox"/> Universities sites <input type="checkbox"/> Others	6	1.000	valid

No	Statement	RI‡	CVI	Content evaluation
44	7. Source(s) of information that you use to inform your practice (may answer more than 1 option) <input type="checkbox"/> Medical journals <input type="checkbox"/> Nursing journals <input type="checkbox"/> Textbooks <input type="checkbox"/> Colleagues <input type="checkbox"/> Courses, seminars <input type="checkbox"/> Government policies, guidelines, protocols <input type="checkbox"/> Others _____	6	1.000	valid
45	8. Have you completed or are you currently involved in a research course? <input type="checkbox"/> Yes <input type="checkbox"/> No	6	1.000	valid
46	9. Have you completed or are you currently involved in a research project? <input type="checkbox"/> Yes <input type="checkbox"/> No	6	1.000	valid
47	10. How often do you use research to inform your practice? <input type="checkbox"/> Never <input type="checkbox"/> Sometimes (1-2 times/year) <input type="checkbox"/> Often (>2 times/year)	6	1.000	valid
<b>Overall CVI Score</b>			<b>0.978</b>	

\*item that was dropped based on the CVI score

‡the number of experts who rated the item either as 3 (relevant with minor alteration) or 4 (relevant and succinct)

The experts were also asked to provide suggestions for alternative wording in items they scored as 2 (partly relevant with major alteration) or 3 (relevant but need minor alteration). All wording suggestions were evaluated and compiled into the final version of the translated questionnaire by the research team (see Appendix 9).

## Factor analysis

### Demographic profile of the respondents

Eight public health centres in the city of Banjarbaru and 26 in Banjarmasin were invited to take part in this study. However, one centre in Banjarbaru and 24 in Banjarmasin declined due to heavy workloads or, in some cases, because they felt this study would not benefit them. Therefore, only nine public health centres in total were involved in this study. A total of 95 questionnaires were distributed to nurses working in these centres, of which 92 were completed and returned, providing a response rate of almost 97%. Table 3 shows the numbers of nurses and questionnaires in each participating public health centre.

A demographic profile of the 92 respondents is presented in Table 4. Most (69.6%) respondents were female and most (78.2%) were aged between 20 and 40 years old. They were predominantly (71.7%) educated at the diploma level. Almost 35% of the respondents had two to five years of experience in their position and almost 30%, six to 10 years. Most (82.6%) had no access to the Internet in their workplace, and 59.8% had experience in conducting and participating in research. Almost 59% of the respondents also had research-related education.

Appendix 10 shows the overall response rate for each item in the questionnaire and descriptive statistics (mean, standard deviation, median and percentiles) of the survey responses. On a five-point scale, where 1 = strongly agree and 5 = strongly disagree, the means (following reverse scoring) ranged from 2.1 to 4.3. A higher score indicated a more positive attitude towards research and research utilisation.

**Table 3 Numbers of nurses and questionnaires in participating public health centres**

<b>Cities</b>	<b>Centre</b>	<b>Number of nurses</b>	<b>Number of distributed questionnaires</b>	<b>Number of completed questionnaires</b>
<b>Banjarbaru</b>	Banjarbaru Utara	7	7	7
	Landasan Ulin	11	11	11
	Cempaka	18	18	18
	Gt. Payung	12	12	11
	Sei Ulin	12	12	12
	Sei Besar	8	8	8
	Liang Anggang	12	12	12
<b>Banjarmasin</b>	Karang Mekar	6	6	5
	Cempaka	9	9	8
<b>TOTAL</b>		95	95	92

### Factor structure and pattern matrices

The 34 items in the questionnaire were subjected to PCA. Prior to performing factor analysis, the factorability of the data was assessed using two statistical measures: Bartlett's test of sphericity (Bartlett 1950) and the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy (Kaiser 1974) generated by SPSS. Bartlett's test reached a significance point ( $\chi^2 = 1766.723$ ,  $DF = 561$ ,  $P < 0.0001$ ), which indicated that the correlation matrix was not an identity matrix. The KMO value was 0.759, which exceeds the recommended value of 0.6 and meets the 'middling' criterion (Kaiser 1974). Appendix 11 provides the KMO and Bartlett's test results.

The factor analysis was done using three iterative analyses. The criteria for the significance of factor loadings was set at 0.55 based on the sample size of 92 respondents (Hair et al. 1995). The first iteration of the PCA identified the presence of 10 components with eigenvalues  $>1$  explaining 73% of the cumulative percentage of variance. After direct oblimin rotation, the pattern matrix showed 10 factors, with only one item loading on five components (3, 7, 8, 9 and 10). A number of items ( $n=15$ ) did not load on any factors. The results of the parallel analysis indicated only five components with eigenvalues greater than the criterion value for a randomly generated data matrix of 34 items with 100 respondents. It was decided to retain five components for further investigation. Appendix 12 presents the scree plot, table of total variance explained and the pattern matrix during the first iteration. Appendix 13 presents the results of the parallel analysis.

**Table 4 Demographic data regarding respondents**

<i>Variable</i>	<i>N</i>	<i>%</i>
<b>Sex</b>		
Male	28	30.4
Female	64	69.6
<b>Age (years)</b>		
20-30	37	40.2
31-40	35	38.0
41-50	16	17.4
>50	4	4.3
<b>Education level</b>		
Vocational school	11	12.0
Diploma degree	66	71.7
Bachelor degree	15	16.3

<b>Length of working experience (years)</b>		
<1	3	3.3
2-5	32	34.8
6-10	27	29.3
11-15	13	14.1
>15	17	18.5
<b>Access to the Internet at work</b>		
Yes	16	17.4
No	76	82.6
<b>Research experience</b>		
Yes	55	59.8
No	37	40.2
<b>Research-related education</b>		
Yes	54	58.7
No	38	41.3

The second iteration of the PCA was run by adding commands to force items loading onto five components. The pattern matrix showed five components with two to six items loading on each component, explaining 55.2% of the cumulative percentage of variance. However, 12 items did not load on any of the components. Each of these was evaluated for possible deletion. It was decided that item 3 'in the nursing area too much is written and there is too much talk about research and development' could be deleted due to its low communality index (0.273). Appendix 14 presents a table of the total variance explained, communalities and pattern matrix during the second iteration.

The third iteration of the PCA was performed using 33 items, and extracted five components. The cumulative percentage of variance was 56.5% with components 1, 2, 3, 4 and 5 contributing 30.35, 8.23, 6.39, 6.00 and 5.39% respectively. Appendix 15 shows a table of the total variance explained during the final iteration.

In order to interpret these components, direct oblimin rotation was performed. The rotated solution revealed the presence of a simpler solution and found seven items that did not load on any of the components. However, deletion of those unloaded items was not considered appropriate as their communality indices were quite high. Therefore, they were retained in the factor solution. Further discussion regarding this is presented in Chapter 5. All unloaded items were captured in Table 5.

Table 5 presents the pattern matrix and the structure matrix showing all loadings, including the communality index for each item. The two highest loadings on Factor 1 were items 'I do not bother to find out about research results' (0.750) and 'It is not meaningful to devote oneself to research in nursing' (0.746). The two highest loadings on Factor 2 were 'Taking part in research does not lead to greater professional skill as a nurse' (0.789) and 'Nursing research does not raise the status of the nursing profession' (0.774). Only two items load on Factor 3, and these were 'The language of scientific articles is much too complex for me' (-0.650) and 'The language used in nursing research is too complex' (-0.632). Three items load in Factor 4. In Factor 5, the highest two loadings were 'We do not need nurse scientists to develop patient care, the practise nurses can do that themselves' (-0.753) and 'The nursing profession does not require research-based knowledge to the same extent as the medical profession' (-0.654).

The final solution of five components extracted were further labelled as Factor 1 'Participation and utilisation of nursing research', Factor 2 'Nursing professional development', Factor 3 'Language of nursing research', Factor 4 'Developing capacity of nurses' and Factor 5 'Need of nursing research'.

**Table 5 Pattern matrix, structure matrix and communalities during the final iteration**

<i>Items (n=33)</i>	<i>Pattern coefficient component</i>					<i>Structure coefficient component</i>					<i>Communalities</i>
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	
28.I do not bother to find out about research results	<b>0.750</b>	-0.132	0.087	0.027	0.115	<b>0.703</b>	0.190	0.038	-0.116	-0.224	0.527
31.It is not meaningful to devote oneself to research in nursing	<b>0.746</b>	0.125	0.036	-0.011	-0.129	<b>0.814</b>	0.227	-0.018	-0.201	-0.471	0.697
26.It is unrealistic to believe one can apply research results to practical nursing	<b>0.734</b>	0.172	-0.074	0.121	-0.040	<b>0.749</b>	0.249	-0.116	-0.061	-0.364	0.608
33.Introducing changes and testing new ideas is very important in the nursing profession	<b>0.734</b>	-0.202	0.036	-0.080	-0.101	<b>0.771</b>	-0.102	-0.026	-0.242	-0.393	0.644
26.Participating in research should be part of the nurse's job	<b>0.732</b>	0.097	-0.062	0.054	-0.010	<b>0.739</b>	0.171	-0.110	-0.118	-0.331	0.561
13.I am keen to participate in international scientific conferences	<b>0.673</b>	-0.099	-0.167	-0.058	-0.045	<b>0.706</b>	-0.019	-0.221	-0.219	-0.328	0.541
30.It is self-evident that the nursing profession should be based on scientific and reliable experience	<b>0.594</b>	0.069	-0.271	-0.057	0.004	<b>0.632</b>	0.131	-0.317	-0.211	-0.275	0.481
32.Nurses should take the time to read research reports	<b>0.558</b>	0.137	0.225	-0.107	-0.158	<b>0.647</b>	0.232	0.177	-0.246	-0.438	0.528
29.Students on the nursing programme are/should be a resource in the workplace to stimulate the development of nursing	<b>0.551</b>	-0.067	-0.147	-0.287	-0.070	<b>0.646</b>	0.019	-0.211	-0.427	-0.346	0.532
24.Nursing research is essential for me in my development as a professional nurse	0.423	0.285	0.171	-0.418	-0.192	<b>0.614</b>	0.390	0.109	-0.548	-0.497	0.714
4.I think it is interesting to read scientific articles about nursing care	0.367	-0.101	0.237	-0.251	-0.295	0.520	0.007	0.187	-0.359	-0.477	0.465
22.Taking part in research does not lead to greater professional skill as a nurse	-0.031	<b>0.789</b>	-0.182	-0.147	-0.191	0.178	<b>0.826</b>	-0.185	-0.235	-0.345	0.780
16.Nursing research does not raise the status of the nursing profession	0.164	<b>0.774</b>	-0.192	-0.080	0.050	0.255	<b>0.785</b>	-0.201	-0.168	-0.174	0.693

<i>Items (n=33)</i>	<i>Pattern coefficient component</i>					<i>Structure coefficient component</i>					<i>Communalities</i>
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	
21.We should have more nurses in clinical work with a PhD/postgraduate education	0.081	<b>0.687</b>	-0.173	0.004	-0.028	0.176	<b>0.698</b>	-0.171	-0.073	-0.185	0.528
34.I think the questions in this questionnaire are important	0.101	<b>0.638</b>	0.244	-0.054	0.180	0.085	<b>0.622</b>	0.241	-0.061	0.017	0.470
9. The language of scientific articles is much too complex for me	0.076	0.295	<b>-0.650</b>	0.192	-0.209	0.202	0.322	<b>-0.639</b>	0.069	-0.265	0.595
20.The language used in nursing research is too complex	0.375	0.097	<b>-0.632</b>	0.064	-0.199	0.502	0.161	<b>-0.654</b>	-0.109	-0.371	0.684
19.My position as a nurse is sufficiently strong to be able to influence nursing without having knowledge of research	0.450	-0.044	0.461	0.059	-0.199	0.484	0.040	0.431	-0.035	-0.369	0.486
10.It is not meaningful to get involved in development work in nursing	0.258	-0.013	0.123	<b>-0.725</b>	-0.029	0.418	0.063	0.046	<b>-0.776</b>	-0.266	0.683
11.Being involved in development work in nursing should be part of the nurse's job	0.188	0.104	0.158	<b>-0.659</b>	-0.201	0.417	0.200	0.091	<b>-0.730</b>	-0.416	0.678
2.Participating in development work in nursing does not benefit nursing skills	-0.178	0.233	0.057	<b>-0.562</b>	-0.223	0.059	0.288	0.025	<b>-0.573</b>	-0.288	0.444
18.A PhD for nurses should be a prerequisite for certain senior positions in nursing	0.322	-0.013	0.136	0.487	-0.296	0.332	0.046	0.149	0.376	-0.343	0.411
16.Lecturers on the nursing should be a nursing development resource in the workplace to stimulate the development of nursing	0.172	-0.029	-0.337	-0.466	-0.283	0.415	0.063	-0.390	<b>-0.580</b>	-0.438	0.596
12.We do not need nursing scientists to develop patient care, the practice nurses can do that themselves	-0.066	-0.054	-0.123	0.073	<b>-0.753</b>	0.243	0.067	-0.120	-0.054	<b>-0.703</b>	0.520
14.Nursing research complicates the ordinary work of nursing	0.045	0.221	-0.170	-0.201	<b>-0.608</b>	0.384	0.344	-0.192	-0.346	<b>-0.704</b>	0.624
1.As a nurse you must be able to read literature in English	-0.023	-0.116	-0.053	-0.201	<b>-0.607</b>	0.272	0.000	-0.075	-0.302	<b>-0.613</b>	0.430



Items (n=33)	Pattern coefficient component					Structure coefficient component					Communalities
	1	2	3	4	5	1	2	3	4	5	
23.The results of nursing research must be disseminated better to nurses in their work	0.117	-0.017	0.104	-0.177	<b>-0.581</b>	0.395	0.110	0.076	-0.297	<b>-0.659</b>	0.487
6.Nursing science and nursing research describes nursing care and makes it visible	0.023	0.178	-0.006	-0.226	<b>-0.570</b>	0.336	0.295	-0.029	-0.345	<b>-0.652</b>	0.511
7.The nursing profession is a practical profession and does not have to include research	0.205	0.111	0.313	0.029	<b>-0.562</b>	0.428	0.234	0.297	-0.098	<b>-0.661</b>	0.575
18.Further training in research and research-based studies is not important for the future	0.151	0.081	-0.098	-0.099	<b>-0.553</b>	0.425	0.200	-0.121	-0.244	<b>-0.651</b>	0.476
27.Proficiency in nursing is primarily attained through long practical experience	-0.370	0.367	0.339	0.361	-0.491	-0.223	0.398	0.393	0.358	-0.330	0.653
8.Research literature on nursing should be available at the workplace	0.292	-0.336	-0.254	-0.140	-0.365	0.462	-0.235	-0.293	-0.269	-0.458	0.493

Note: major loadings for each item are in bold

**Table 6 Unloaded items with factor loadings <0.55 from the final iteration**

<i>Items (n=7)</i>	<i>Factor loadings</i>
Nursing research is essential for me in my development as a professional nurse	0.423
I think it is interesting to read scientific articles about nursing care	0.367
My position as a nurse is sufficiently strong to be able to influence nursing without having knowledge of research	0.461
A PhD for nurses should be a prerequisite for certain senior positions in nursing	0.487
Lecturers on the nursing education programme are/should be a resource in the workplace to stimulate the development of nursing	-0.466
Proficiency in nursing is primarily attained through long practical experience	-0.491
Research literature on nursing should be available at the workplace	-0.365

### **Internal consistency (homogeneity reliability test)**

The homogeneity reliability of the instrument, that is, its internal consistency, was also measured using Cronbach's alpha coefficient. Bjorkstrom and Hamrin (2001) showed that the ATRAD-N questionnaire has a good internal consistency, with a Cronbach's alpha coefficient of 0.940. In this study, the overall Cronbach's alpha coefficient was 0.902. Considering that this study extracted different factors than that of Björkström and Hamrin (2001), it was decided not to compare the Cronbach's alpha coefficient for each factor between the two studies.

The inter-item correlation matrix values were all positive, indicating that all the items have been correctly reverse scored. Cronbach's alpha for factors ranged from 0.719 (Factor 4: developing capacity of nurses) to 0.884 (Factor 1: participation and utilisation of nursing research). Two items had higher Cronbach's alpha values than the factor values: 'I think the questions in this questionnaire are important' ( $\alpha = 0.800$ ) and 'Participating in development work in nursing does not benefit nursing skills' ( $\alpha = 0.792$ ). Table 7 reports the Cronbach's alpha coefficients for the entire scale and individual factors. The values of deleted items are also included, together with the mean and standard deviation of the value for each item.

**Table 7 Factors, items and Cronbach's alpha,  $\alpha$**

<i>Factors and items</i>	$\alpha$	<i><math>\alpha</math> if item deleted</i>	<i>(+)/(-)</i>	<i>Mean</i>	<i>SD</i>	<i>n</i>
<b>Factor 1 'participation and utilisation of nursing research' (nine items)</b>	0.884					
I do not bother to find out about research results		0.875	(+)	30.761	0.717	92
It is not meaningful to devote oneself to research in nursing		0.862	(-)	30.761	0.635	92
It is unrealistic to believe one can apply research results to practical nursing		0.869	(-)	30.848	0.610	92
Introducing changes and testing new ideas is very important in the nursing profession		0.867	(+)	40.076	0.650	92
Participating in research should be part of the nurse's job		0.870	(+)	30.685	0.769	92
I am keen to participate in international scientific conferences		0.870	(+)	30.793	0.764	92
It is self-evident that the nursing profession should be based on scientific and reliable experience		0.882	(+)	30.815	0.864	92
Nurses should take the time to read research reports		0.876	(+)	30.913	0.640	92
Students on the nursing programme are/should be a resource in the workplace to stimulate the development of nursing		0.872	(+)	30.880	0.754	92
<b>Factor 2 'nursing professional development' (four items)</b>	0.782					
Taking part in research does not lead to greater professional skill as a nurse		0.662	(-)	30.543	10.010	92
Nursing research does not raise the status of the nursing profession		0.708	(-)	30.620	10.088	92
We should have more nurses in clinical work with a PhD/postgraduate education		0.717	(+)	30.000	10.069	92
I think the questions in this questionnaire are important		0.800	(+)	30.815	0.725	92
<b>Factor 3 'language of nursing research' (two items)</b>	0.821					
The language of scientific articles is much too complex for me		0.696*	(-)	30.152	0.889	92
The language used in nursing research is too complex		0.696*	(-)	30.217	0.887	92
<b>Factor 4 'developing capacity of nurses' (three items)</b>	0.719					
It is not meaningful to get involved in development work in nursing		0.548	(-)	40.087	0.690	92
Being involved in development work in nursing should be part of the nurse's job		0.482	(+)	40.000 0	0.629	92
Participating in development work in nursing does not benefit nursing skills		0.792	(-)	40.217	0.551	92
<b>Factor 5 'need of nursing research' (eight items)</b>	0.828					
We do not need nurse scientists to develop patient care, the practise nurses can do that themselves		0.818	(-)	30.533	0.943	92
The nursing profession does not require research-based knowledge to the same extent as the medical profession		0.806	(-)	30.880	0.850	92
Nursing research complicates the ordinary work of nursing		0.798	(-)	30.739	0.739	92
As a nurse, you must be able to read literature in English		0.814	(+)	30.859	0.704	92
The results of nursing research must be disseminated better to nurses in their work		0.805	(+)	40.337	0.560	92

<i>Factors and items</i>	$\alpha$	$\alpha$ if item deleted	(+)/(-)	Mean	SD	<i>n</i>
Nursing science and nursing research describes nursing care and makes it visible		0.808	(+)	40.359	0.604	92
The nursing profession is a practical profession and does not have to include research		0.806	(-)	40.109	0.703	92
Further training in research and research-based studies is not important for the future		0.812	(-)	40.152	0.512	92
<b>Unloaded Items (seven items)</b>						
Nursing research is essential for me in my development as a professional nurse						
I think it is interesting to read scientific articles about nursing care						
My position as a nurse is sufficiently strong to be able to influence nursing without having knowledge of research						
A PhD for nurses should be a prerequisite for certain senior positions in nursing						
Lecturers on the nursing education programme are/should be a resource in the workplace to stimulate the development of nursing						
Proficiency in nursing is primarily attained through long practical experience						
Research literature on nursing should be available at the workplace						
<b>Item deleted during factor analysis (one item)</b>						
In the nursing area too much is written and there is too much talk about research and development						
<b>Overall Cronbach's alpha if factor is ignored</b>	<b>0.902</b>					

\*mean inter-item correlation for the item

## Univariate analysis

A series of independent-sample *t*-tests was conducted to compare the questionnaire scores for several dichotomous socio-demographic factors. Table 9 displays total and each factor scores split by sex, age, level of education, length of working experience, Internet access, research education and research experience. The total factor scores could be between 26 and 130 and the respondents' scores varied between 64 and 127. The mean value is 99.15 and SD, 10.74.

As is evident in Table 9, two socio-demographic factors had a significant difference in mean total factor scores: level of education and access to Internet in the workplace. Nurses who were educated at university level had a higher mean value than those who were educated at non-university level ( $P = 0.003$ ). Likewise, nurses who had access to the Internet had a higher mean value than those with no Internet access ( $P = 0.017$ ).

In Factor 1 (participation and utilisation of nursing research), there was a significant difference in mean factor scores between those who were educated at university and non-university levels. University-educated nurses had a higher mean value than did those with no university training ( $P = 0.002$ ). There was also a significant difference in mean scores between those who had access to the Internet at work and those who had not. Nurses with access to the Internet had a higher mean value than those who had no Internet access ( $P = 0.003$ ). In contrast, in Factor 2 (nursing professional development) there was no significant difference in mean factor scores for any of the socio-demographic features of the respondents.

In Factor 3 (language of nursing research), there was a significant difference in mean factor scores between those who had been working for more than 10 years, and those for less. Nurses who had been working for 10 years or less had a higher mean value than those who had been working for more than 10 years ( $P = 0.017$ ). There was also a significant difference in mean scores between those with and without research experience. Nurses who had prior research experience had a higher mean value than those who had none ( $P = 0.002$ ).

In Factor 4 (developing capacity of nurses), there was a significant difference in mean factor scores between those who had access to Internet in the workplace and those who had not. Nurses with Internet access had a higher mean value than those without ( $P = 0.026$ ). There was also a significant difference in mean scores between those who had received research education through formal or informal activities and those who had not. The latter had a higher mean value than those who had received research education ( $P = 0.005$ ).

In Factor 5 (need of nursing research), there was a significant difference in mean factor scores between those who were educated at university level and those who were not. University-educated nurses had a significantly higher mean value ( $P = 0.001$ ).

Further analysis was conducted to describe the strength and direction of the linear relationships between the factors using Spearman rank-order correlation coefficients. There was a strong, positive correlation between total factors and each of Factors 1, 2, 3, 4 and 5 ( $r = 0.800, 0.631, 0.554, 0.526, 0.840$  respectively,  $n=92, P < 0.0001$ ) with positive attitudes towards nursing research and development being associated with positive attitudes towards participation and utilisation of nursing research, nursing professional

development, language of nursing research, developing capacity of nurses and need of nursing research. The correlations among factors are given in Table 8.

**Table 8 Spearman rank-order correlation coefficient among total factor and individual factors**

	<b>Total factors</b>	<b>Total Factor 1</b> <i>'Participation and utilisation of nursing research'</i>	<b>Total Factor 2</b> <i>'Nursing professional development'</i>	<b>Total Factor 3</b> <i>'Language of nursing research'</i>	<b>Total Factor 4</b> <i>'Developing capacity of nurses'</i>	<b>Total Factor 5</b> <i>'Need of nursing research'</i>
<b>Total factors</b>	-	0.800**	0.631**	0.554**	0.526**	0.840**
<b>Total Factor 1</b>		-	0.407**	0.365**	0.402**	0.569**
<b>Total Factor 2</b>			-	0.335**	0.247*	0.348**
<b>Total Factor 3</b>				-	0.123	0.336**
<b>Total Factor 4</b>					-	0.498**
<b>Total Factor 5</b>						-

\*\* $P < 0.001$  (2-tailed)

\* $P < 0.05$  (2-tailed)

**Table 9 Independent sample t-test scores**

	Factor 1 'participation and utilisation of nursing research'§				Factor 2 'nursing professional development'†				Factor 3 'language of nursing research'‡				Factor 4 'developing capacity of nurses'£				Factor 5 'need of nursing research'®				Total factors**			
	n	mean	SD	P	n	mean	SD	P	n	mean	SD	P	n	mean	SD	P	n	mean	SD	P	n	mean	SD	P
<b>Sex</b>				0.096				0.558				0.506				0.503				0.128				0.297
Male	28	35.75	3.96		28	13.64	3.96		28	6.18	1.93		28	12.46	1.50		28	32.89	3.62		28	100.93	9.98	
Female	64	34.00	4.84		64	14.13	2.59		64	6.45	1.50		64	12.23	1.51		64	31.56	3.91		64	98.38	11.04	
<b>Age (years)</b>				0.406				0.269				0.256				0.897				0.317				0.871
20–40	72	34.32	4.79		72	13.79	3.04		72	6.47	1.59		72	12.29	1.41		72	32.18	3.74		72	99.06	10.95	
>40	20	35.30	4.08		20	14.65	3.12		20	6.00	1.78		20	12.35	1.84		20	31.20	4.25		20	99.50	10.22	
<b>Level of education</b>				0.002*				0.967				0.071				0.31				0.001*				0.003*
Non-university	77	33.87	4.38		77	13.99	2.65		77	6.23	1.58		77	12.23	1.48		77	31.38	3.72		77	97.70	10.00	
University	15	37.93	4.56		15	13.93	4.76		15	7.07	1.79		15	12.67	1.63		15	35.00	3.12		15	106.60	11.69	
<b>Number of years working</b>				0.342				0.202				0.017*				0.961				0.693				0.792
0–10	35	33.94	4.47		35	13.46	2.84		35	6.89	1.45		35	12.31	1.57		35	32.17	3.42		35	98.77	9.98	
>10	57	34.89	4.75		57	14.30	3.17		57	6.05	1.67		57	12.30	1.48		57	31.84	4.12		57	99.39	11.27	
<b>Internet access at work</b>				0.003*				1.43				0.309				0.026*				0.093				0.017*
Yes	16	36.69	2.41		16	15.00	1.97		16	6.75	1.81		16	13.06	1.39		16	33.44	3.63		16	104.94	7.35	
No	76	34.08	4.87		76	13.76	3.21		76	6.29	1.60		76	12.14	1.49		76	31.66	3.85		76	97.93	10.98	
<b>Research education</b>				0.971				0.544				0.321				0.005*				0.539				0.528
Yes	55	34.55	5.50		55	13.82	3.46		55	6.51	1.64		55	11.98	1.69		55	31.76	3.92		55	98.62	12.45	
No	37	34.51	3.00		37	14.22	2.37		37	6.16	1.62		37	12.78	1.00		37	32.27	3.78		37	99.95	7.63	
<b>Research experience</b>				0.291				0.237				0.002*				0.827				0.557				0.11
Yes	54	34.96	5.41		54	14.30	3.22		54	6.80	1.45		54	12.33	1.55		54	32.17	4.18		54	100.56	12.19	
No	38	33.92	3.22		38	13.53	2.80		38	5.76	1.72		38	12.26	1.45		38	31.68	3.37		38	97.16	7.99	

\*mean scores differ between the two groups ( $P \leq 0.05$ )

§Item value = 9–45; †item value = 4–20; ‡item value = 2–10; £item value 3–15; ®item value 8–40; \*\*item value 26–130

## **Conclusion**

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This chapter has reported results of the translation, adaptation and psychometric testing of the ATRAD-N instrument. Translation occurred via a standard forward and back-translation process. During the adaptation and content validity process, some changes were made to the instrument, including deleting one item, adding 10 items related to biographical information, and making modifications enabling a focus on Indonesian primary health care settings. The final instrument showed acceptable content validity with an overall index of 0.97.

A total of 92 respondents agreed to participate in this study. They were predominantly female (69.6%), ranged from 20 to 40 years of age (78.2%), were educated at the diploma level (71.7%), had 2 to 5 years of experience in their position (35%) and had no access to the Internet in their workplace (82.6%).

The factor analysis was done by PCA with direct oblimin rotation methods through three iterative analyses. This process extracted five components labelled as Factor 1 'participation and utilisation of nursing research', Factor 2 'nursing professional development', Factor 3 'language of nursing research', Factor 4 'developing capacity of nurses' and Factor 5 'need of nursing research'. Seven items of the instrument did not load to any of those factors. The cumulative percentage of variance was 56.5%. The instrument also was found to have good internal consistency with a Cronbach's alpha coefficient of 0.902.

Univariate analysis was performed using independent sample *t*-tests and Spearman rank-order correlation coefficients. The *t*-tests revealed two socio-demographic factors with a significant difference in mean total factor scores: level of education ( $P = 0.003$ ) and access to the Internet at work ( $P = 0.017$ ). There was a strong, positive correlation between total factors and Factors 1, 2, 3, 4 and 5 (Spearman's  $r = 0.800, 0.631, 0.554, 0.526, 0.840$ , respectively,  $n=92, P < 0.0001$ ).

The following chapter will discuss the research findings and incorporate them into the existing body of knowledge. The study will be critically reviewed in terms of its significance to nursing practice, its limitations and consequent recommendations for further investigation.



# Chapter 5 – Discussion

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## **Introduction**

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The previous chapter detailed the findings of this study in relation to the translation, adaptation and psychometric testing of the ATRAD-N instrument. This final chapter presents a discussion of the significance of the research findings and incorporates it into the existing body of knowledge. Issues related to the limitations of this study will also be outlined. This chapter will also include a discussion of the implications of the study findings for practice, and recommendations for further investigation.

## **Restatement of the problem**

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The literature review presented in Chapter 2 highlighted the importance of understanding the attitudes of nurses towards research and research utilisation and identified the factors that influence the use of research outcomes in nursing, and the aspects that facilitate nurse participation in research to improve nursing care. However, in the context of Indonesian primary health care services, the importance of nursing research and research utilisation has only recently been recognised, and published data on the topic are scant. To support relevant research, it is imperative to have a reliable and valid instrument to measure parameters of concern in the context of Indonesian primary health care settings.

This study describes the Indonesian translation and adaptation process of the ATRAD-N, and psychometric testing of the translated instrument. The aim of this research was to develop a valid and reliable instrument to measure Indonesian primary health care nurses' attitudes towards nursing research and research utilisation. The findings of the study are discussed in this chapter.

## **Summary description of procedures**

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The study employed a multi-step process of translation, adaptation and psychometric testing of a questionnaire to measure nurses' attitudes towards research and research utilisation. This process enabled the researcher to take a previously developed questionnaire and apply a rigorous process to adapt it for use in a different cultural context.

## **Major findings**

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A number of studies have focused on assessing instruments designed to measure and assess research utilisation in practice, and individual factors associated with research utilisation (Estabrooks, C & Wallin 2004; Frasure, J. 2008; Squires, J, Adachi & Estabrooks 2008; Squires, Janet et al. 2011). This study contributed to the development of a valid and reliable instrument to measure nursing research and research utilisation in another international setting.

In the first stage, the original English version of the ATRAD-N was translated into Indonesian. Although there is no agreement regarding the most appropriate process of translation of instruments in cross-cultural studies, it should be done systematically, with clear descriptions of each phase to ensure the process is rigorous. The guidelines developed by Beaton et al. (2000), Gudmundsson (2009) and Sousa and Rojjanasrirat (2011) was combined for cross-cultural adaptation of a self-report instrument to achieve a quality translation. Although Sousa and Rojjanasrirat (2011) stress the importance of using translators with knowledge of health care terminology, this was not possible in the current study due to limited translation facilities with this particular specifications. However, no item was found to be difficult to translate as the concepts were not specifically grounded in medical or nursing knowledge. It could be argued that statements in the original English version of the instrument reflected the same perceptions in the Indonesian health care setting. A small number of items had minor semantic and idiomatic discrepancies between the languages, but those items were revised during discussions with the research team.

The preliminary Indonesian translation of the instrument was reviewed by six experts with community nursing backgrounds from various universities in Indonesia. It was intended that more experts would review the instrument but due to time constraints only six experts were available. The participation of these experts was important in the adaptation process because of their knowledge and expertise in Indonesian primary health care settings.

The translated instrument was found to be valid on the basis of the high overall CVI score from the experts. However, one item (item 15 'Nursing education programmes are too research based') was deleted because it received a low individual item CVI score. This deletion was reasonable considering that nursing research is a new concept in the Indonesian nursing environment and the inclusion of research into the nursing education system is still in its infancy. In an instrument development process, it would be

inappropriate to include items that are not relevant in the environmental context (Osborne & Schneider 2013).

Items were also deleted from the original English questionnaire due to differences in culture and context, following attentive consideration by the research team. Examples of deleted items were item 36 'have you been present at a public defence of a PhD thesis (in nursing research/caring nursing) during the last five years?', and item 37 'how often do you read the following journals in nursing and/or caring science?'. Indonesian nursing settings do not present the opportunity for primary health care nurses to view public defences of PhD theses or access the international nursing journals listed in the questionnaire. Further, there are only a very limited number of Indonesian nursing journals. Items 38 and 39 were also deleted due to their irrelevance in Indonesian nursing settings.

We added 10 biographical items to the translated questionnaire that are more relevant to Indonesian primary health care nurses. These were related to sex, age, level of education, length of working experience, access to the Internet and sources of information to inform nursing practice, involvement in nursing research and research courses, and frequency of using research findings in practice. By adding these biographical items, we intended to gain basic information about individual factors that influence nursing research and research utilisation by Indonesian primary health care nurses. The newly generated items in the translated questionnaire were deemed valid during the expert content validity process.

Some items in the questionnaire were reworded to increase their applicability in Indonesian primary health care settings. For example, the words 'ward' and 'workplace' were replaced with the more exclusive 'public health centres'. Although these changes were important to make the translated version of the questionnaire relevant in the study setting, they do make it more difficult to compare the findings of our study and previous research.

An important issue to highlight in this discussion is the factor structure of the instrument. The factor structure described by Björkström & Hamrin (2001), Marshall et al. (2007) and Nilsson Kajermo et al. (2013a) is quite different to that extracted during the factor analysis in this current study. Björkström & Hamrin (2001) extracted a seven-factor structure, Nilsson Kajermo et al. (2013) a three-factor structure, and Marshall et al. (2007) a two-factor structure, while this study found a five-factor structure. The latter was the simplest reasonable factor structure, based on particular circumstances surrounding our data. If our

sample had been different, the results may also have differed, but our main goal was to test the validity and reliability of the instrument across settings.

Extracting the factor structure proceeded differently in this study compared to previous work. Instead of using a maximum likelihood extraction method, we used PCA with direct oblimin rotation to replicate the construct validity. We did this to find the most psychometrically sound and simplest approach. Careful consideration was also given to the sample size and correlations among factors when choosing the factor extraction method. It was also necessary to run three iteration factor analyses and to delete one item during those iterative analyses, resulting in a 33-item scale.

The factor loading cut off of 0.55 used in this study was higher than those used in previous studies (0.32–0.40) (Björkström & Hamrin 2001; Marshall et al. 2007; Nilsson Kajermo et al. 2013a). The higher factor loading cut off was necessary to maintain a strict power level of 80% and 0.5 significance with the sample size of 92 respondents. This significance level for the interpretation of factor loadings was determined following the approach outlined by Hair et al. (1995).

Seven items did not load in any of the extracted factors because their factor loadings were <0.55. However, those items were retained due to their acceptable communality values and their contribution to the overall research. It could be argued that those unloaded items were not having an adequate explanation in the construct that they failed to represent in the factor structure. Marshall et al. (2007) also encountered problems maintaining construct validity of the ATRAD-N instrument, due to 'abstract constructs' (Marshall, A. P. et al. 2007). Further, Frasure, J. (2008), in his systematic review, found that the ATRAD-N did not clearly declare its theoretical framework, which is important to define a construct of the instrument.

Flaws in the ATRAD-N questionnaire construct were also evident when the questionnaire failed to maintain its original factor structure when tested in different settings. Marshall et al. (2007) were unable to present adequate factor structure of the instrument because their factor structure accounted for only 28.3% of the total variance. Nilsson Kajermo et al. (2013) found a three-factor structure that grouped items based on positively and negatively worded items. Perhaps items in the questionnaire are interpreted differently among the varied nursing settings. For example, in the original study by Björkström and Hamrin (2001),

the items 'The nursing profession is a practical profession and does not have to include research' and 'Further training in research and research-based studies is not important for the future' loaded to a factor labelled 'the profession', whereas in this study those two items loaded to a factor labelled 'need of nursing research'. It is unclear whether these two items were about the profession or nursing research. Further refinement and retesting of this instrument would improve its construct validity.

This study achieved a 97% sample response rate from nine public health centre populations in two cities in South Kalimantan, Indonesia. However, because the data were collected in order to assess the validity and reliability (through factor analysis) of the questionnaire, rather than reporting questionnaire scores, the sample size was small given the number of items ( $n=34$ ) in the translated questionnaire. Even though there is no agreement on an acceptable ratio of cases to variables for factor analysis, a general rule of thumb from the literature is a minimum of five cases for each variable to be analysed (DeVon et al. 2007; Hair et al. 1995; Kootstra 2004; Williams, Brown & Onsmann 2010). Accordingly, the sample size of 92 in this study was too small for factor analysis. However, confidence in our findings is increased by the results of the Bartlett's test of sphericity, and the KMO assessment of 'middling' for sampling adequacy, which judges our sample size as sufficient to perform factor analysis.

The Cronbach's alpha coefficient for individual factors of the instrument ranged from 0.719 to 0.884, suggesting good internal consistency of the instrument. None of the items had corrected item-total correlation scores  $<0.3$ , indicating that each item correlated well with the total value. However, two items ('I think the questions in this questionnaire are important' ( $\alpha = 0.800$ ) and 'Participating in development work in nursing does not benefit nursing skills' ( $\alpha = 0.792$ )) had higher individual Cronbach's alpha if item deleted scores than their total factor scores. Removing those items from the instrument may increase the reliability of those factors.

It is interesting to note that the overall Cronbach's alpha score for the questionnaire in this study was  $>0.9$ , as in the studies of Björkström & Hamrin (2001) and Nilsson Kajermo et al. (2013). Experts disagree about the ideal score of Cronbach's alpha to determine homogeneity reliability. According to Gillespie and Chaboyer (2013), scores  $<0.7$  indicate lack of correlation between items in the instrument and according to DeVellis (2003) scores  $>0.9$  indicate redundancy of one or more items. DeVellis (2003) suggest that an instrument

with Cronbach's alpha score  $>0.9$  should be shortened because of this strong correlation between items. Some items may be too similar in the instrument used in this study—for example, 'The language used in nursing research is too complicated' and 'The language of scientific articles are too complex for me'—and it may be better to review the items for redundancy.

The respondents for psychometric testing in this study were collected using a convenience sampling method from a population of Indonesian primary health care nurses—a completely different geography, culture, situation and context sample than the sample used in previous studies (Björkström & Hamrin 2001; Björkström et al. 2003; Marshall et al. 2007; Nilsson Kajermo et al. 2013). However, it is important that the ATRAD-N instrument is tested in different samples in order to demonstrate its validity and reliability across different settings (Gillespie & Chaboyer 2013; Pett, Lackey & Sullivan 2003a, 2003c)).

The results of this study offer some support for the alternative hypothesis, indicating a difference in psychometric properties of the ATRAD-N between the primary language (English) and the target language (Indonesia). The adaptation and psychometric testing of the instrument for use in Indonesian primary health care settings did not mirror previous study findings.

In its present form, the Indonesian translation of the ATRAD-N should be used with some caution as further investigation of the psychometric properties of the instrument is required. Studies with more respondents should be undertaken to better establish the validity and reliability of the instrument. Further (univariate) analysis of biographical information on the respondents in this study was included, and related with factor scores, to provide basic information regarding Indonesian nurses' attitudes towards research and research utilisation, and individual factors associated with it. A strong, positive correlation was found between total scores and individual factor scores: positive attitudes towards nursing research and development were associated with positive attitudes towards participation and utilisation of nursing research, nursing professional development, language of nursing research, developing capacity of nurses and need of nursing research. This fact supported Estabrooks, CA et al. (2003) explanation that beliefs, barriers and facilitators are potential individual elements influencing participation and utilisation of nursing research. The current study also found that level of education and access to the Internet significantly influenced nurses' attitudes towards research and research utilisation

in Indonesia. Nurses who were educated at university level had a higher mean value than those who were educated at non-university level ( $P = 0.003$ ). Likewise, nurses who had access to the Internet had a higher mean value than those with no Internet access ( $P = 0.017$ ). However, this extra analysis should be interpreted with caution until it can be confirmed with further studies.

### **Study limitations**

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This study has several methodological weaknesses that should be taken into account when interpreting its findings. With regard to the adaptation and content validity process, only six Indonesian university experts were invited. Although there are no specific guidelines relating to the number of experts required to adapt and assess content appropriateness, a larger number in this study may have provided more insight regarding the study context. In the process of psychometrically testing the instrument, we collected data from only two cities in one region, so the results may not be representative of the broader Indonesian primary health care system. Due to time constraints and permissions to conduct the study, only eight public health centres with 92 respondents were accessed, which is a relatively small sample for psychometric testing of an instrument.

### **Recommendations**

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In order to establish a valid and reliable instrument to measure nurses' attitudes towards research and research utilisation in Indonesian primary health care settings, it is important to repeat this study with a larger sample size from a broader range of such settings. Further investigation also could be directed to translate, adapt and psychometrically test other similar instruments. Comparisons among results for different instruments would identify the best instrument for use in Indonesian primary health care settings.

Once a valid and reliable instrument is available, it is imperative to conduct a study to understand Indonesian nurses' attitudes towards research and research utilisation, the factors that influence this, and the aspects that facilitate Indonesian nurses to participate in research, which remains unexplored. This study provides important preliminary information to inform further investigation.

## **Conclusion**

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Translation, adaptation and psychometric testing of an instrument to be used in a novel cultural context are complex and challenging processes. Applying systematic and rigorous methods during the process will ensure that the resulting instrument will be valid and reliable. This study has developed and tested the first Indonesian instrument to measure nurses' attitudes towards research and research utilisation in primary health care settings. Following translation, adaptation and psychometric testing, it was found that the ATRAD-N instrument showed content validity and homogeneity reliability, but not construct validity in Indonesian settings. Thus, further development, refinement and retesting of the instrument would be essential to produce a psychometrically sound instrument.



# APPENDICES

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## Appendix 1 Approval to use the instrument ATRAD-N from the originators of the instrument

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The University of Adelaide Mail - POLITE REMINDER Fwd: Permission... file:///D:/[NIA]/[THESIS]/The University of Adelaide Mail - POLITE R...



Kurnia Rachmawati <a1617115@student.adelaide.edu.au>

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### POLITE REMINDER Fwd: Permission to use the instrument 'NATARD'

---

Monica Björkström <monica.bjorkstrom@kau.se>  
To: Kurnia Rachmawati <kurnia.rachmawati@student.adelaide.edu.au>

22 May 2013 02:32

Dear Kurnia

Sorry, I have not answered you before.

I'm pleased that you are interested in our instrument. We intended to further development the instrument since there are some parts that need to change. However, it will not be possible for us to do this development now. Therefore, if you would like to use the instrument please check out so it will be good for your study before you use it (version II from 2002). You may also use some parts of the instrument or change some parts but in that case please let me know..

I look forward to hear from you again.

Sincerely Monica Björkström

Från: Kurnia Rachmawati [mailto:kurnia.rachmawati@student.adelaide.edu.au]  
Skickat: den 18 maj 2013 08:39  
Till: monica.bjorkstrom@kau.se  
Ämne: POLITE REMINDER Fwd: Permission to use the instrument 'NATARD'

[Quoted text hidden]

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#### 2 attachments

- Instruction, 23 July 2002 and April 2012.pdf  
145K
- Questionnaire, version II 23 July 2002, MB.doc  
129K

## Appendix 2 The ethics approval

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RESEARCH BRANCH  
OFFICE OF RESEARCH ETHICS, COMPLIANCE AND  
INTEGRITY

BEVERLEY DOBBS  
EXECUTIVE OFFICER  
LOW RISK HUMAN RESEARCH ETHICS REVIEW  
GROUP (FACULTY OF HUMANITIES AND SOCIAL  
SCIENCES AND FACULTY OF THE PROFESSIONS)  
THE UNIVERSITY OF ADELAIDE  
SA 5005  
AUSTRALIA  
TELEPHONE +61 8 8313 4725  
FACSIMILE +61 8 8313 7325  
email: beverley.dobbs@adelaide.edu.au

23 July 2013

Dr L Cusack  
School of School of Nursing

Dear Dr Cusack

**ETHICS APPROVAL No:** HS-2013-041  
**PROJECT TITLE:** Translation, adaption and psychometric testing of the questionnaire 'Nurses' Attitudes Towards and Awareness of Research and Development in Nursing' for use in Indonesian primary health care settings

I write to advise that the Low Risk Human Research Ethics Review Group (Faculty of Health Sciences) has approved the above project. The ethics expiry date for this project is **31 July 2016**.

Ethics approval is granted for three years subject to satisfactory annual progress and completion reporting. The form titled *Project Status Report* is to be used when reporting annual progress and project completion and can be downloaded at <http://www.adelaide.edu.au/ethics/human/guidelines/reporting>. On expiry, ethics approval may be extended for a further period.

Participants in the study are to be given a copy of the Information Sheet and the signed Consent Form to retain. It is also a condition of approval that you **immediately report** anything which might warrant review of ethical approval including:


- serious or unexpected adverse effects on participants,
- previously unforeseen events which might affect continued ethical acceptability of the project,
- proposed changes to the protocol; and
- the project is discontinued before the expected date of completion.

Please refer to the following ethics approval document for any additional conditions that may apply to this project.

Yours sincerely

Dr John Semmler  
HREC Convenor on behalf of the  
Low Risk Human Research Ethics Review Group (Faculty of Health Sciences)

## Appendix 3 Approval from the Department of Health to conduct a study in the public health centres in the city of Banjarbaru, South Kalimantan

																					
<b>PEMERINTAH KOTA BANJARBARU</b> <b>BADAN PELAYANAN PERIJINAN TERPADU (BP2T)</b> <b>KOTA BANJARBARU</b>																					
Alamat Kantor : Jl. Wijaya Kusuma No. 3 Banjarbaru 70711      Telp. (0511) 4781711 Fax. (0511) 4781886      Website: bp2t.banjarbarukota.go.id																					
<b>SURAT IJIN PENELITIAN</b> Nomor : 557 / VII / BP2T / 2013																					
MEMBACA	: 1. Surat dari Dekan FK Unlam No : 638/UN8.1.17/PLU/2013, tanggal Juli 2013 Perihal Mohon Izin Penelitian																				
MENGINGAT	: 1. Undang-Undang Nomor 32 Tahun 2004 tentang Pemerintahan Daerah ; 2. Peraturan Pemerintah Nomor 25 Tahun 2000 tentang Kewenangan Pemerintah dan Kewenangan Propinsi sebagai Daerah Otonomi ; 3. Peraturan Daerah Kota Banjarbaru Nomor 11 Tahun 2008 tentang Organisasi dan Tata Kerja Dinas Daerah di Lingkungan Pemerintah Kota Banjarbaru ; 4. Peraturan Daerah Kota Banjarbaru Nomor 12 Tahun 2008 tentang Pembentukan Organisasi dan Tata Kerja Lembaga Teknis Daerah dan Satuan Polisi Pamong Praja Kota Banjarbaru ; 5. Peraturan Walikota Banjarbaru Nomor 01 Tahun 2006 tentang Pendelegasian Kewenangan Penandatanganan Naskah Dinas di Bidang Perijinan Kepada Pejabat di Lingkungan Pemerintah Kota Banjarbaru ; 6. Peraturan Walikota Banjarbaru Nomor 03 Tahun 2007 tentang Tata Laksana Pemberian Ijin Melakukan Penelitian ; 7. Peraturan Walikota Banjarbaru Nomor 8 Tahun 2010 tentang Pelimpahan Kewenangan Penandatanganan Beberapa Perijinan Dari Kepala Dinas Satuan Kerja Perangkat Daerah Kepada Kepala Badan Pelayanan Perijinan Terpadu (BP2T) Kota Banjarbaru.																				
MEMPERHATIKAN	: Proposal kegiatan yang bersangkutan.																				
MEMUTUSKAN	: Memberikan Ijin Penelitian Kepada : <table border="0" style="margin-left: 20px;"><tr><td>N a m a</td><td>: <b>KURNIA RACHMAWATI, S.Kep, Ns</b></td></tr><tr><td>Alamat</td><td>: Komp. Green Tasbih Blok B-4 Kota Banjarbaru.</td></tr><tr><td>Pekerjaan</td><td>: Dosen</td></tr><tr><td>Prodi/ Jurusan</td><td>: Ilmu Keperawatan</td></tr><tr><td>NIM/NIP</td><td>: -</td></tr><tr><td>Judul Penelitian</td><td>: Adaptasi dan Uji Analisis Psikometri Sikap Perawat Puskesmas Terhadap Penelitian dan Penggunaan Penelitian Keperawatan Pada Puskesmas di Indonesia</td></tr><tr><td>Lama Penelitian</td><td>: 2 (dua) Bulan</td></tr><tr><td>Lokasi Penelitian</td><td>: Puskesmas di Kota Banjarbaru.</td></tr><tr><td>Pembimbing</td><td>: 1. Dr. Lynette Cusack 2. 3.</td></tr><tr><td>Tujuan Penelitian</td><td>: Untuk Mengetahui Penggunaan Penelitian Keperawatan Bagi Perawat Puskesmas di Indonesia</td></tr></table>	N a m a	: <b>KURNIA RACHMAWATI, S.Kep, Ns</b>	Alamat	: Komp. Green Tasbih Blok B-4 Kota Banjarbaru.	Pekerjaan	: Dosen	Prodi/ Jurusan	: Ilmu Keperawatan	NIM/NIP	: -	Judul Penelitian	: Adaptasi dan Uji Analisis Psikometri Sikap Perawat Puskesmas Terhadap Penelitian dan Penggunaan Penelitian Keperawatan Pada Puskesmas di Indonesia	Lama Penelitian	: 2 (dua) Bulan	Lokasi Penelitian	: Puskesmas di Kota Banjarbaru.	Pembimbing	: 1. Dr. Lynette Cusack 2. 3.	Tujuan Penelitian	: Untuk Mengetahui Penggunaan Penelitian Keperawatan Bagi Perawat Puskesmas di Indonesia
N a m a	: <b>KURNIA RACHMAWATI, S.Kep, Ns</b>																				
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Lokasi Penelitian	: Puskesmas di Kota Banjarbaru.																				
Pembimbing	: 1. Dr. Lynette Cusack 2. 3.																				
Tujuan Penelitian	: Untuk Mengetahui Penggunaan Penelitian Keperawatan Bagi Perawat Puskesmas di Indonesia																				
Dengan ketentuan sebagai berikut :																					
<ol style="list-style-type: none"><li>1. Sebelum melakukan Penelitian sesuai permohonan, harus melaporkan diri kepada Pejabat yang berwenang setempat dengan menunjukkan Surat Ijin yang diberikan.</li><li>2. Tidak dibenarkan melakukan hal-hal yang tidak sesuai dengan Ijin ini.</li><li>3. Harus mentaati semua ketentuan perundangan yang berlaku serta Adat Istiadat/Budaya setempat.</li><li>4. Apabila Surat Ijin ini telah habis masa berlakunya sedang pelaksanaan Penelitian belum selesai, yang bersangkutan diwajibkan mengajukan permohonan kembali kepada instansi pemberi Ijin.</li><li>5. Surat Ijin Penelitian ini akan dicabut dan ditarik kembali apabila pemegang surat ini terbukti melanggar ketentuan tersebut di atas.</li><li>6. Surat Ijin mulai berlaku sejak tanggal ditetapkan dengan ketentuan apabila dikemudian hari terdapat kekeliruan dalam penetapan ini akan diubah dan diperbaiki sebagaimana mestinya.</li></ol>																					
Demikian Surat Ijin Penelitian ini diberikan untuk dipergunakan sebagaimana mestinya.																					
Tembusan:																					
<ol style="list-style-type: none"><li>1. Walikota Banjarbaru (sebagai laporan).</li><li>2. Kepala Badan Kesbanglinmas Kota Banjarbaru.</li><li>3. Dekan FK Unlam.</li><li>4. Kepala Puskesmas di Kota Banjarbaru</li><li>5. Yang Bersangkutan.</li></ol>																					

## Appendix 4 Approval from the Department of Health to conduct a study in the public health centres in the city of Banjarmasin, South Kalimantan



### PEMERINTAH KOTA BANJARMASIN DINAS KESEHATAN

Jl. Pramuka komp. Tirta Dharma ( PDAM) Km.6 Telp.(0511) 4281348  
BANJARMASIN

Nomor : 070/3422/Diskes.  
Lampiran : --  
Hal : Izin Penelitian

Banjarmasin, 12 Juli 2013

Kepada Yth.  
Dekan  
Fakultas Kedokteran  
Universitas Lambung Mangkurat  
di -  
Banjarmasin

Sehubungan dengan surat Saudara tanggal 14 Juni 2013, Nomor: B.386/UN8.1.17/PL/2013 perihal seperti tersebut diatas bersama ini disampaikan bahwa pada prinsipnya kami tidak berkeberatan dan mengizinkan melakukan kegiatan dimaksud di wilayah kerja Dinas Kesehatan Kota Banjarmasin pada Puskesmas....., atas :

Nama / NIM : KURNIA RACHIMAWATI, S.kep,Ns /

Judul : Adaptasi dan Uji Analisis Psikometri Sikap Perawat Puskesmas Terhadap Penelitian dan Penggunaan Penelitian Keperawatan pada Puskesmas di Indonesia.

Sebelum dan selama melaksanakan kegiatan agar berkonsultasi dengan Kepala Bidang Pelayanan Kesehatan pada Dinas Kesehatan Kota Banjarmasin, dan setelah selesai melaksanakan kegiatan dimaksud agar melapor dan menyampaikan hasil penelitian/pendataan tersebut ke Sekretaris Dinas Kesehatan Kota Banjarmasin untuk konfirmasi data.

Demikian disampaikan, atas perhatian Dekan Fakultas Kedokteran Universitas Lambung Mangkurat, diucapkan terima kasih.

Tembusan disampaikan kepada yth. :

1. Kepala Bidang Yankes. Diskeskot Banjarmasin
2. Kepala Puskesmas ..... Banjarmasin di Banjarmasin
3. Yang bersangkutan.

## Appendix 5 The participant information sheet

SCHOOL OF  
NURSING



THE UNIVERSITY  
*of* ADELAIDE

### PARTICIPANT INFORMATION SHEET

We are conducting a study to adapt and validate a questionnaire titled 'Nurses' Attitudes Towards and Awareness of Research and Development in Nursing' (NATARD). The objects of the study are to:

- I. translate a previously developed questionnaire, titled Nurses' Attitudes Towards and Awareness of Research and Development in Nursing (NATARD) from the source language (English) to target language (Indonesian),
- II. evaluate and adapt the questionnaire in terms of items, instruction for administration, and scoring rules,
- III. estimate the validity (content and construct validity) of the translated questionnaire, and
- IV. estimate the reliability (equivalence and homogeneity reliability) of the translated questionnaire

#### **Participation**

We are inviting you to participate in this research study by completing the attached questionnaire. Your participation is voluntary. You can withdraw from this study at any time without giving a reason. It will take approximately 15 minutes to complete the questionnaire.

#### **The survey population**

We are contacting all public health care nurses in the city of Banjarmasin and Banjarbaru, South Kalimantan, Indonesia.

#### **Aims of the study**

The aim of this research is to ensure that there will be a valid and reliable instrument to measure primary health care nurses' attitudes towards nursing research and research utilisation within the Indonesian.

#### **Possible benefits of the research**

The main benefit of this research is to provide a reliable and valid instrument that can be used in Indonesia to explore primary health care nurses' attitudes towards research and research utilisation. Through participating in validating this adapted questionnaire the participants' will benefit by having a tool that provides information for health officials and nursing educators to develop strategies facilitating nurses' use of research to improve patient care.

#### **Commitments**

Your willingness to complete the instrument is an indication of your consent.

**Anonymity and Confidentiality**

This research study is anonymous. No participant information such as names or location is required for this research. You will be asked to place the completed questionnaire in the sealed collection box. A sealed box will be provided to collect the questionnaires in each primary health care institution. Data will be stored securely for 5 years at The University of Adelaide, School of Nursing, and will remain confidential. Only the research team can access the data.

**Contacts**

This research project has been approved by the University of Adelaide Human Research Ethics Committee.

**What happens if I have concerns about this research and want to talk to someone?**

If you are at all concerned about what we are doing, please email :

**Dr Lynette Cusack** at [lynette.cusack@adelaide.edu.au](mailto:lynette.cusack@adelaide.edu.au).

or

The Adelaide University Human Research Ethics Committee, if you wish to discuss with an independent person matters related to

- making a complaint, or
- raising concerns on the conduct of the project, or
- the University policy on research involving human participants, or
- your rights as a participant

contact **the Human Research Ethics Committee's Secretary** on phone **+61 8 8313 6028**

or

**Devi Rahmayanti, S.Kep, Ns**

Penelitian dan Pengabdian Masyarakat  
(Research and Community Development)

School of Nursing

University of Lambung Mangkurat

Jl. A.Yani Km. 36.00 Banjarbaru

South Kalimantan, Indonesia

Ph : [+62 511 4772745](tel:+625114772745)

## **Appendix 6 The translation certification statement from all translators used in the study**

---

### **Forward translator 1**

The questionnaire *Nurses' attitudes and awareness of research and development within nursing (version II)* was translated as a correct and true English version of the original in every particular.

### TRANSLATION CERTIFICATION STATEMENT

I do hereby certify that I am fluent in both English and Indonesian languages, that I have carefully translated the questionnaire "*Nurses' attitudes and awareness of research and development within nursing (version II)*" in the English language into the document in the Indonesian language, and that the same is a true and complete translation to the best of my knowledge, ability, and belief.

Name : Hasti Rahmanyas

Qualification(s) : Masters of Applied Linguistics

Signed

Date : 5 / 7 / 2013



**Back-translator**

\*\*\*\*\*

**CERTIFICATION**

This is to certify that the above translation is an accurate extract translation undertaken by a NAATI accredited Indonesian translator.

10 July 2013

The Translator: (Dr. Ron Witton - NAATI No 10070)

ABN: 40 585 409 253  
22 Moore St  
Austinmer NSW 2515  
Tel: 02.4267 1994  
Mobile: 0409 399 752  
e-mail: [rwitton@uow.edu.au](mailto:rwitton@uow.edu.au)

## Appendix 7 The original instrument

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23th July 2002/04th April 2012



Division for Health and Caring Sciences

**Instruction for using the questionnaire:  
Nurses' attitudes towards and awareness of research and development within nursing,  
ATRAD-N, version II**

"

We are pleased that you would like to review our instrument and consider it for use. However, we are grateful if you give us some information about your study. Please send us also a copy of your final manuscript/article where the instrument is included.

The questionnaire *Attitudes towards research and development within nursing, ATRAD-N, for nurses, version II* has in 2002 been properly language validated from Swedish to English. Therefore it is important that you are using version II since the items in Björkström & Hamrin, *Journal of Advanced Nursing*, 2001, 34(5), 706-714, Table 1, belong to version I. However, when you are using the instrument, apply the same sub scales (Factors) as reported in the above article Table 1. Observe the article Björkström & Hamrin, *Journal of Advanced Nursing*, 2001, 34(5), 706-714, page 708, **incorrectly states** that we have used confirmatory likelihood factor analysis while we in fact used exploratory maximum likelihood factor analysis. Observe that item No 14 is **not included** in the factors or in the summary score of the instrument. Also **observe**, that when you are computing your data, negative items should change score so that score 1 is being counted as 5 and 5 as 1 etc., that means they should be reversed. See pages 708 and 709 in the above article.

If the instrument needs further translation from English to another language it will be necessary to do a new language validation. Please give us a report over your procedure of the language validation. If you for example translate it from English to Hungarian, the proper way is to have a native Hungarian who is good in English to do the translation into Hungarian. Then a native English person who knows Hungarian well should do the back-translation into English. After that you can compare with the original English version and do corrections.

We are looking forward to hear from you.

Yours sincerely  
*Monica Björkström*,  
Lecturer in Nursing, RN,RNT,MSc  
Division for Health and Caring Sciences,  
Karlstad University,  
SE-651 88 Karlstad, Sweden  
e-mail: monica.bjorkstrom@kau.se

*Elisabeth Hamrin*,  
Professor emeritus, RN,BM,PhD  
Department of Medicine and Care,  
Clinical Pharmacology, Faculty of  
Health Sciences, Linköping University,  
SE-581 85 Linköping, Sweden  
e-mail: elisabeth.hamrin@liu.se

## QUESTIONNAIRE

**Nurses' attitudes and awareness of research and development within nursing (version II<sup>a</sup>)**

**Instructions:** The following pages contain a number of statements, which you are asked to evaluate by indicating the degree to which you agree with them. Circle the alternative which best represents your standpoint. 1= do not agree at all, 2= agree to a little extent, 3= agree to a certain extent, 4= agree to a great extent, 5= agree to a very great extent

	Do not agree at all	Agree to a little extent	Agree to a certain extent	Agree to a great extent	Agree to a very great extent
1. As a nurse, you must be able to read literature in English	1	2	3	4	5
2. Participating in development work in nursing does not benefit nursing skills	1	2	3	4	5
3. In the nursing area too much is written and there is too much talk about research and development	1	2	3	4	5
4. I think it is interesting to read scientific articles about nursing care	1	2	3	4	5
5. The nursing profession does not require research-based knowledge to the same extent as the medical profession	1	2	3	4	5
6. Nursing science and nursing research describes nursing care and makes it visible	1	2	3	4	5
7. The nursing profession is a practical profession and does not have to include research	1	2	3	4	5
8. Research literature on nursing should be available at the workplace (e.g. wards)	1	2	3	4	5
9. The language of scientific articles is much too complex for me	1	2	3	4	5
10. It is not meaningful to get involved in development work in nursing	1	2	3	4	5
11. Being involved in development work in nursing should be part of the nurse's job	1	2	3	4	5
12. We do not need nurse scientists to develop patient care, the practise nurses can do that themselves.	1	2	3	4	5
13. I am keen to participate in international scientific conferences	1	2	3	4	5

<sup>a</sup> Björkström and Hamrin SJUKSKÖTERSORS INSTÄLLNING TILL FORSKNING OCH UTVECKLING INOM OMRVÄRDAD  
Copyright 1977 and 2002: Monica Björkström and Elisabeth Hamrin, Sweden. English translation, version II, 2002: Copyright English translation Monica Björkström Division for Health and Caring Sciences Karlstad University, Sweden and Elisabeth Hamrin, Department of Medicine and Care, Linköping University, Sweden. (Language validation Michael Cooper and Jeanette Palm, Karlstad University.)  
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	Do not agree at all	Agree to a little extent	Agree to a certain extent	Agree to a great extent	Agree to a very great extent
14. The nursing education programme is too research-based	1	2	3	4	5
15. Nursing research complicates the ordinary work of nursing	1	2	3	4	5
16. Lecturers on the nursing education programme are/should be a resource in the workplace to stimulate the development of nursing	1	2	3	4	5
17. Nursing research does not raise the status of the nursing profession	1	2	3	4	5
18. A PhD for nurses should be a prerequisite for certain senior positions in nursing	1	2	3	4	5
19. Further training in research and research-based studies is not important for the future	1	2	3	4	5
20. My position as a nurse is sufficiently strong to be able to influence nursing without having knowledge of research	1	2	3	4	5
21. The language used in nursing research is too complex	1	2	3	4	5
22. We should have more nurses in clinical work with a PhD/postgraduate education	1	2	3	4	5
23. Taking part in research does not lead to greater professional skill as a nurse	1	2	3	4	5
24. The results of nursing research must be disseminated better to nurses in their work	1	2	3	4	5
25. Nursing research is essential for me in my development as a professional nurse	1	2	3	4	5
26. It is unrealistic to believe one can apply research results to practical nursing.	1	2	3	4	5
27. Participating in research should be part of the nurse's job	1	2	3	4	5
28. Proficiency in nursing is primarily attained through long practical experience	1	2	3	4	5
29. I do not bother to find out about research results	1	2	3	4	5
30. Students on the nursing programme are/should be a resource in the workplace to stimulate the development of nursing	1	2	3	4	5
31. It is self-evident that the nursing profession should be based on scientific and reliable experience	1	2	3	4	5
32. It is not meaningful to devote oneself to research in nursing	1	2	3	4	5

	Do not agree at all	Agree to a little extent	Agree to a certain extent	Agree to a great extent	Agree to a very great extent
33. Nurses should take the time to read research reports	1	2	3	4	5
34. Introducing changes and testing new ideas is very important in the nursing profession	1	2	3	4	5
35. I think the questions in this questionnaire are important	1	2	3	4	5

Comments:

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Answer the following questions by ticking the appropriate box.

36. Have you been present at a public defence of a PhD thesis (in nursing research/caring science) during the last five years?

- never     once     2-3 times     4-5 times     more than 5 times

37. How often do you read the following journals in nursing and/or caring science?

	Once a week	Once a month	Once a quarter	Once a year	Never
Vård i Norden					
Scandinavian Journal of Caring Sciences					
Journal of Advanced Nursing					
International Journal of Nursing Studies					
Nursing research					
Advances in Nursing Sciences					
Research in Nursing and Health					
Journal of Clinical Nursing					
Others: (e.g. National association journals. Give the name of each on a separate line and indicate how often you read it)					

Comments:

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38. Some nurses think it is often difficult to apply the results from nursing research to daily activities. Considering your own situation, how often do you use results from nursing research in your own work?

- never       hardly ever       now and then       often       very often

39. Do you know anyone with a PhD in nursing research in your country?

- yes       no

If yes, name those you know best

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*Thank you for your participation*

Reference:

Björkström M. & Hamrin E. (2001) Swedish nurses' attitudes towards research and development within nursing. *Journal of Advanced Nursing* 34 (5), 706-714.

## Appendix 8 Comparison of the original instrument and blind back-translated instrument

No.	Original statements	Blind back-translated statements
1.	<b>Instructions:</b> The following pages contain a number of statements, which you are asked to evaluate by indicating the degree to which you agree with them. Circle the alternative which best represents your standpoint. 1= do not agree at all, 2= agree to a little extent, 3= agree to a certain extent, 4= agree to a great extent, 5= agree to a very great extent	<b>Instructions:</b> The following pages have a number of questions which request your evaluation by indicating the level of agreement you choose. Circle the choice which most closely represents your opinion. 1= strongly disagree, 2= disagree, 3= somewhat agree, 4= agree, 5= strongly agree
2.	As a nurse, you must be able to read literature in English	As a nurse, you must be able to read literature in English
3.	Participating in development work in nursing does not benefit nursing skills	Participation in nurse development projects provides no benefit to nursing skills
4.	In the nursing area too much is written and there is too much talk about research and development	In the world of nursing, too much is written and there is too much discourse about research and development
5.	I think it is interesting to read scientific articles about nursing care	In my opinion it is interesting to read scientific articles about nursing
6.	The nursing profession does not require research-based knowledge to the same extent as the medical profession	The nursing profession does not need to be research knowledge based as is appropriate in the medical profession.
7.	Nursing science and nursing research describes nursing care and makes it visible	The science of nursing and nursing research illustrates nursing matters and makes them clearly visible
8.	The nursing profession is a practical profession and does not have to include research	The profession of nursing is a practical profession and does not have to include research
9.	Research literature on nursing should be available at the workplace (e.g. wards)	Research literature in nursing needs to be available in the workplace (e.g. in the ward)
10.	The language of scientific articles is much too complex for me	The language of scientific articles are too complex for me
11.	It is not meaningful to get involved in development work in nursing	To be involved in nursing development projects is not important
12.	Being involved in development work in nursing should be part of the nurse's job	To be involved in nursing development projects should be part of a nurse's work

No.	Original statements	Blind back-translated statements
13.	We do not need nurse scientists to develop patient care, the practise nurses can do that themselves	We do not need nursing science to develop patient nursing, nurses can carry out such matters themselves
14.	I am keen to participate in international scientific conferences	I am enthusiastic to attend international scientific conferences
15.	The nursing education programme is too research-based	Nursing education programmes are too research based
16.	Nursing research complicates the ordinary work of nursing	Nursing research makes general nursing work too complicated
17.	Lecturers on the nursing education programme are/should be a resource in the workplace to stimulate the development of nursing	Teachers in nursing education must become resources in the workplace in order to promotes nursing development
18.	Nursing research does not raise the status of the nursing profession	Nursing research does not raise nursing professional status
19.	A PhD for nurses should be a prerequisite for certain senior positions in nursing	A doctor degree in nursing needs to be made a pre-condition to be appointed to certain senior positions in nursing
20.	Further training in research and research-based studies is not important for the future	Advanced training in research and research based studies will not be important in the future
21.	My position as a nurse is sufficiently strong to be able to influence nursing without having knowledge of research	My position as a nurse is already strong enough to influence nursing without having to have knowledge of research
22.	The language used in nursing research is too complex	The language used in nursing research is too complicated
23.	We should have more nurses in clinical work with a PhD/postgraduate education	We need to have more nurses with doctoral education in clinical work
24.	Taking part in research does not lead to greater professional skill as a nurse	To be involved in research does not result in a nurse having a better increased professional skill level
25.	The results of nursing research must be disseminated better to nurses in their work	Results of nursing research need to be more widely distributed to nurses in the workplace
26.	Nursing research is essential for me in my development as a professional nurse	Nursing research is important for my self-development in becoming a professional nurse
27.	It is unrealistic to believe one can apply research results to practical nursing	To believe that someone can apply research results in nursing practice is



No.	Original statements	Blind back-translated statements
		unrealistic
28.	Participating in research should be part of the nurse's job	To be involved in research should become a part of the nursing occupation
29.	Proficiency in nursing is primarily attained through long practical experience	Nursing expertise is mainly achieved by long nursing practice
30.	I do not bother to find out about research results	I don't need to take the trouble to find out about research results
31.	Students on the nursing programme are/should be a resource in the workplace to stimulate the development of nursing	Students in nursing programmes must become resources in the workplace in order to promote nursing development
32.	It is self-evident that the nursing profession should be based on scientific and reliable experience	The nursing profession clearly must be based in scientific experience and be credible
33.	It is not meaningful to devote oneself to research in nursing	To devote oneself to nursing research is not worthwhile
34.	Nurses should take the time to read research reports	Nursing must provide time for reading research reports
35.	Introducing changes and testing new ideas is very important in the nursing profession	To introduce and test new ideas is extremely important in the world of nursing
36.	I think the questions in this questionnaire are important	I think that the questions in this questionnaire are very important

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**Appendix 9 The final translated instrument (in Indonesian) after adaptation and content validity process**

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## KUESIONER

### SIKAP DAN KESADARAN PERAWAT TERHADAP PENELITIAN DAN PENGEMBANGAN KEPERAWATAN (*Nurses' attitudes and awareness of research and development within nursing version II<sup>o</sup>*)

**Petunjuk pengisian:** Halaman berikut berisi sejumlah pernyataan, yang harus anda nilai dengan menunjukkan tingkat kesetujuan anda terhadap pernyataan tersebut. Lingkari pilihan yang paling mencerminkan sikap anda.

- 1 = Sangat tidak setuju
- 2 = Tidak setuju
- 3 = Agak setuju
- 4 = Setuju
- 5 = Sangat setuju

No.	PERNYATAAN	Sangat tidak setuju	Tidak setuju	Agak setuju	Setuju	Sangat setuju
1.	Sebagai perawat, anda harus mampu memahami literatur berbahasa Inggris (buku teks, artikel dalam jurnal, dll)	1	2	3	4	5
2.	Partisipasi dalam program pengembangan keilmuan tidak memberi manfaat terhadap keterampilan perawat	1	2	3	4	5
3.	Dalam keperawatan, terlalu banyak teori dan wacana tentang penelitian dan pengembangan	1	2	3	4	5
4.	Saya tertarik untuk membaca artikel ilmiah mengenai ilmu keperawatan	1	2	3	4	5
5.	Profesi keperawatan tidak memerlukan pengetahuan berbasis penelitian sebanyak yang diperlukan oleh profesi kedokteran	1	2	3	4	5
6.	Ilmu dan penelitian keperawatan membuat praktek asuhan keperawatan menjadi jelas	1	2	3	4	5
7.	Profesi keperawatan adalah profesi praktis dan tidak memerlukan penelitian	1	2	3	4	5
8.	Literatur penelitian keperawatan harus tersedia di tempat kerja (mis: Puskesmas)	1	2	3	4	5
9.	Bahasa yang digunakan dalam artikel ilmiah terlalu rumit bagi saya	1	2	3	4	5

No.	PERNYATAAN	Sangat tidak setuju	Tidak setuju	Agak setuju	Setuju	Sangat setuju
10.	Terlibat dalam program pengembangan keperawatan bukanlah hal penting	1	2	3	4	5
11.	Terlibat dalam program pengembangan keperawatan harus menjadi bagian dari tanggungjawab seorang perawat	1	2	3	4	5
12.	Kita tidak memerlukan keberadaan perawat peneliti secara khusus untuk mengembangkan asuhan keperawatan, sebab perawat umum dapat melakukan hal itu sendiri	1	2	3	4	5
13.	Saya antusias untuk mengikuti konferensi dan seminar ilmiah	1	2	3	4	5
14.	Penelitian keperawatan justru membuat rumit pekerjaan umum perawat	1	2	3	4	5
15.	Pengajar dalam pendidikan keperawatan harus menjadi narasumber untuk mendorong pengembangan keperawatan di lahan praktek	1	2	3	4	5
16.	Penelitian keperawatan tidak meningkatkan status profesi keperawatan	1	2	3	4	5
17.	Gelar S2/S3 harus menjadi syarat untuk menempati posisi senior tertentu dalam keperawatan	1	2	3	4	5
18.	Pelatihan tingkat lanjut dalam penelitian dan studi berbasis penelitian tidak penting pada masa mendatang	1	2	3	4	5
19.	Posisi saya sebagai perawat pada saat ini sudah cukup kuat untuk mempengaruhi keperawatan tanpa harus mempunyai pengetahuan tentang penelitian	1	2	3	4	5
20.	Bahasa yang digunakan dalam penelitian keperawatan terlalu rumit	1	2	3	4	5
21.	Kita harus memiliki lebih banyak perawat dengan pendidikan S2 atau S3 di Puskesmas	1	2	3	4	5
22.	Terlibat dalam penelitian tidak menjadikan seorang perawat memiliki peningkatan ketrampilan profesional yang lebih baik	1	2	3	4	5

No.	PERNYATAAN	Sangat tidak setuju	Tidak setuju	Agak setuju	Setuju	Sangat setuju
23.	Hasil penelitian keperawatan harus lebih disebarluaskan kepada perawat-perawat di tempat kerja, termasuk di Puskesmas	1	2	3	4	5
24.	Penelitian keperawatan sangat penting dalam pengembangan diri saya sebagai seorang perawat profesional	1	2	3	4	5
25.	Meyakini bahwa hasil penelitian dapat diterapkan dalam praktek keperawatan merupakan hal yang tidak realistis	1	2	3	4	5
26.	Terlibat dalam penelitian adalah bagian dari pekerjaan perawat	1	2	3	4	5
27.	Keahlian keperawatan dicapai terutama dengan pengalaman praktek yang lama	1	2	3	4	5
28.	Saya tidak perlu bersusah payah mencari tahu tentang hasil penelitian	1	2	3	4	5
29.	Mahasiswa keperawatan harus menjadi sumber daya untuk mendorong perkembangan keperawatan di Puskesmas	1	2	3	4	5
30.	Pengalaman ilmiah harus menjadi landasan profesi keperawatan	1	2	3	4	5
31.	Seorang perawat tidak perlu menyediakan waktunya untuk penelitian	1	2	3	4	5
32.	Perawat harus meluangkan waktu untuk membaca hasil penelitian	1	2	3	4	5
33.	Menciptakan perubahan dan gagasan baru sangatlah penting dalam profesi keperawatan	1	2	3	4	5
34.	Saya merasa bahwa pertanyaan-pertanyaan dalam kuesioner ini penting	1	2	3	4	5

*With thanks to Monica Björkström and Elisabeth Hamrin for permission to translate and adapt this questionnaire.*

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### **DATA BIOGRAFI RESPONDEN**

**Petunjuk pengisian:** Silahkan memberikan tanda centang (v) pada kotak yang sesuai dengan situasi Anda.

1. Jenis Kelamin
  - Laki-laki
  - Perempuan
2. Usia
  - 20-30 tahun
  - 31-40 tahun
  - 41-50 tahun
  - >50 tahun
3. Pendidikan terakhir
  - SPK
  - D3
  - S1
  - S2
4. Lama pengalaman kerja
  - < 1 tahun
  - 2-5 tahun
  - 6-10 tahun
  - 11-15 tahun
  - >15 tahun
5. Ketersediaan akses terhadap internet untuk pengembangan ilmu keperawatan di Puskesmas
  - Ada *(silahkan lanjutkan ke pertanyaan no.6)*
  - Tidak ada *(silahkan lanjutkan ke pertanyaan no.7)*
6. Informasi terkait pengembangan ilmu keperawatan yang Anda akses melalui internet: (boleh lebih dari satu jawaban)
  - Jurnal kedokteran atau kesehatan
  - Jurnal keperawatan
  - Data dari situs pemerintah (Depkes RI, Dinkes daerah,dll)
  - Data dari situs organisasi profesi (PPNI, IDI, IBI, AIPNI, AIPDIKI,dll)
  - Hasil penelitian yang dipublikasikan oleh situs universitas/perguruan tinggi
  - Lainnya *(sebutkan)* \_\_\_\_\_
7. Sumber-sumber informasi yang Anda gunakan untuk menambah wawasan ilmu keperawatan di Puskesmas (boleh lebih dari satu jawaban)
  - Jurnal kedokteran atau kesehatan
  - Jurnal keperawatan
  - Buku-buku tentang kesehatan
  - Teman sejawat
  - Pelatihan, seminar
  - Panduan dari pemerintah
  - Lainnya *(sebutkan)* \_\_\_\_\_
8. Apakah Anda pernah dan/atau sedang mengikuti pendidikan/pelatihan penelitian keperawatan?
  - Pernah
  - Tidak pernah
9. Apakah Anda pernah terlibat dalam penelitian keperawatan?
  - Pernah
  - Tidak pernah
10. Seberapa sering Anda menggunakan hasil penelitian keperawatan untuk diterapkan di Puskesmas?
  - Tidak pernah
  - Jarang (1-2 kali/tahun)
  - Sering (>2 kali/tahun)

**Appendix 10 The overall response rate for each item in the ATRAD-N, together with descriptive statistic (means, standard deviations, medians and percentiles) of the survey responses**

	<i>Response Frequencies</i>										<i>Descriptive statistics</i>			
	<i>1</i>		<i>2</i>		<i>3</i>		<i>4</i>		<i>5</i>		<i>Median</i>	<i>(Q1-Q3)</i>	<i>Mean</i>	<i>(SD)</i>
	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>				
As a nurse you must be able to read literature in English	0	0	3	3.3	21	22.8	54	58.7	14	15.2	4.00	3-4	3.86	0.70
Participating in development work in nursing does not benefit nursing skills	0	0	1	1.1	3	3.3	63	68.5	25	27.2	4.00	4-5	4.22	0.55
In the nursing area too much is written and there is too much talk about research&development	1	1.1	36	39.1	23	25.0	30	32.6	2	2.2	3.00	2-4	2.96	0.92
I think it is interesting to read scientific articles about nursing care	0	0	1	1.1	7	7.6	66	71.7	18	19.6	4.00	4-4	4.10	0.56
The nursing profession does not require research based knowledge to the same extent as the medical profession	0	0	10	10.9	9	9.8	55	59.8	18	19.6	4.00	4-4	3.88	0.85
Nursing science and nursing research describes nursing care and makes it visible	0	0	0	0	6	6.5	47	51.1	39	42.4	4.00	4-5	4.36	0.60
The nursing profession is a practical profession and does not have to include research	1	1.1	2	2.2	6	6.5	60	65.2	23	25.0	4.00	4-4.75	4.11	0.70
Research literature on nursing should be available at the workplace	0	0	4	4.3	5	5.4	59	64.1	24	26.1	4.00	4-5	4.12	0.69
The language of scientific articles is much too complex for me	2	2.2	23	25.0	27	29.3	39	42.4	1	1.1	3.00	2-4	3.15	0.89
It is not meaningful to get involved in development work in nursing	0	0	3	3.3	9	9.8	57	62.0	23	25.0	4.00	4-4.75	4.09	0.69
Being involved in development work in nursing should be part of the nurse's job	0	0	2	2.2	12	13.0	62	67.4	16	17.4	4.00	4-4	4.00	0.63
We do not need nursing scientists to develop patient care, the practice nurses can do that themselves	1	1.1	18	19.6	12	13.0	53	57.6	8	8.7	4.00	3-4	3.53	0.94

I am keen to participate in international scientific conferences	0	0	7	7.6	17	18.5	56	60.9	12	13.0	4.00	3-4	3.79	0.76
Nursing research complicates the ordinary work of nursing	0	0	8	8.7	16	17.4	60	65.2	8	8.7	4.00	3-4	3.74	0.74
Lecturers on the nursing should be a nursing development resource in the workplace to stimulate the development of nursing	0	0	5	5.4	5	5.4	55	59.8	27	29.3	4.00	4-5	4.13	0.74
Nursing research does not raise the status of the nursing profession	6	6.5	12	13.0	6	6.5	55	59.8	13	14.1	4.00	3-4	3.62	1.09
A PhD for nurses should be a prerequisite for certain senior positions in nursing	8	8.7	30	32.6	20	21.7	23	25.0	11	12.0	3.00	2-4	2.99	1.19
Further training in research and research-based studies is not important for the future	0	0	1	1.1	3	3.3	69	75.0	19	20.7	4.00	4-4	4.15	0.51
My position as a nurse is sufficiently strong to be able to influence nursing without having knowledge of research	0	0	1	1.1	11	12.0	70	76.1	10	10.9	4.00	4-4	3.97	0.52
The language used in nursing research is too complex	2	2.2	20	21.7	28	30.4	40	43.5	2	2.2	3.00	3-4	3.22	0.89
We should have more nurses in clinical work with a PhD/postgraduate education	6	6.5	30	32.6	18	19.6	34	37.0	4	4.3	3.00	2-4	3.00	1.07
Taking part in research does not lead to greater professional skill as a nurse	4	4.3	12	13.0	17	18.5	48	52.2	11	12.0	4.00	3-4	3.54	1.01
The results of nursing research must be disseminated better to nurses in their work	0	0	0	0	4	4.3	53	57.6	35	38.0	4.00	4-5	4.34	0.56
Nursing research is essential for me in my development as a professional nurse	0	0	4	4.3	9	9.8	53	57.6	26	28.3	4.00	4-5	4.10	0.74
It is unrealistic to believe one can apply research results to practical nursing	0	0	5	5.4	10	10.9	71	77.2	6	6.5	4.00	4-4	3.85	0.61
Participating in research should be part of the nurse's job	0	0	9	9.8	19	20.7	56	60.9	8	8.7	4.00	3-4	3.68	0.77
Proficiency in nursing is primarily attained through long practical experience	18	19.6	53	57.6	14	15.2	7	7.6			2.00	2-2	2.11	0.80
I do not bother to find out about research results	0	0	7	7.6	16	17.4	61	66.3	8	8.7	4.00	3.25-4	3.76	0.72



<b>Students on the nursing programme are/should be a resource in the workplace to stimulate the development of nursing</b>	0	0	5	5.4	17	18.5	54	58.7	16	17.4	4.00	4-4	3.88	0.75
<b>It is self-evident that the nursing profession should be based on scientific and reliable experience</b>	0	0	11	12.0	11	12.0	54	58.7	16	17.4	4.00	4-4	3.82	0.86
<b>It is not meaningful to devote oneself to research in nursing</b>	0	0	5	5.4	17	18.5	65	70.7	5	5.4	4.00	4-4	3.76	0.64
<b>Nurses should take the time to read research reports</b>	0	0	2	2.2	17	18.5	60	65.2	13	14.1	4.00	4-4	3.91	0.64
<b>Introducing changes and testing new ideas is very important in the nursing profession</b>	0	0	3	3.3	7	7.6	62	67.4	20	21.7	4.00	4-4	4.08	0.65
<b>I think the questions in this questionnaire are important</b>	3	3.3	1	1.1	13	14.1	68	73.9	7	7.6	4.00	4-4	3.82	0.73

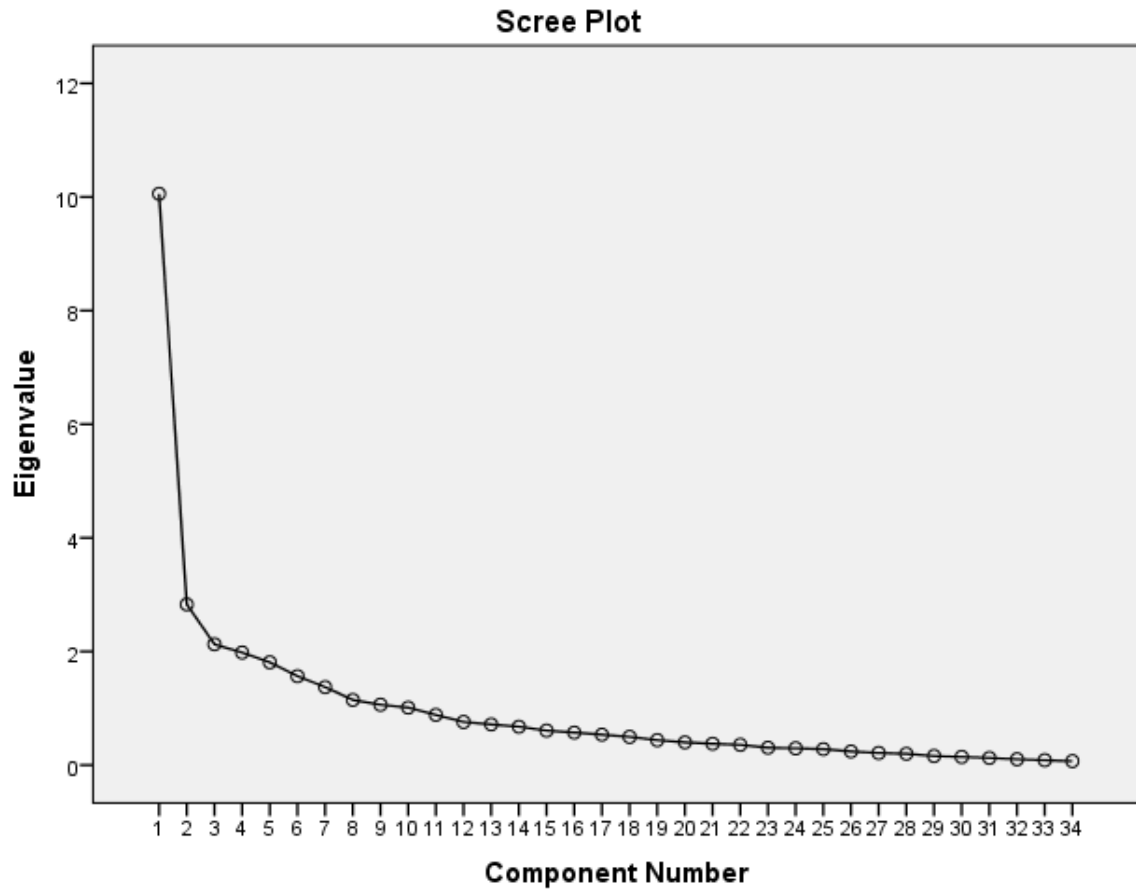
## Appendix 11 The Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity for the data

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KMO measure of sampling adequacy.		0.779
	Approx. chi-square	1715.330
Bartlett's test of sphericity	df	528
	Significance	<0.0001

## Appendix 12 The scree plot, total variance explained and pattern matrix during the first iteration of factor analysis

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**Total Variance Explained**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings <sup>a</sup>
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	10.056	29.577	29.577	10.056	29.577	29.577	5.460
2	2.828	8.317	37.894	2.828	8.317	37.894	3.682
3	2.127	6.256	44.150	2.127	6.256	44.150	2.005
4	1.981	5.827	49.977	1.981	5.827	49.977	4.866
5	1.809	5.320	55.297	1.809	5.320	55.297	3.657
6	1.566	4.606	59.903	1.566	4.606	59.903	2.708
7	1.372	4.035	63.938	1.372	4.035	63.938	2.876
8	1.147	3.373	67.311	1.147	3.373	67.311	4.665
9	1.063	3.126	70.437	1.063	3.126	70.437	1.597
10	1.012	2.977	73.413	1.012	2.977	73.413	4.033
11	.883	2.598	76.011				
12	.758	2.231	78.242				
13	.717	2.109	80.351				
14	.676	1.988	82.339				
15	.607	1.785	84.124				
16	.573	1.685	85.809				
17	.535	1.573	87.382				
18	.497	1.462	88.844				
19	.439	1.292	90.135				
20	.400	1.178	91.313				
21	.376	1.106	92.419				
22	.357	1.051	93.469				
23	.305	.898	94.367				
24	.295	.868	95.235				
25	.281	.826	96.062				
26	.239	.704	96.765				
27	.213	.628	97.393				
28	.200	.587	97.980				
29	.159	.469	98.449				
30	.143	.422	98.871				
31	.126	.372	99.243				
32	.102	.301	99.544				
33	.085	.251	99.795				
34	.070	.205	100.000				

Extraction Method: Principal Component Analysis.

a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Pattern Matrix<sup>a</sup>

	Component									
	1	2	3	4	5	6	7	8	9	10
I do not bother to find out about research results	.693									
I am keen to participate in international scientific conferences	.679									
It is unrealistic to believe one can apply research results to practical nursing	.614									
It is not meaningful to devote oneself to research in nursing										
Introducing changes and testing new ideas is very important in the nursing profession										
Students on the nursing programme are/should be a resource in the workplace to stimulate the development of nursing										
We should have more nurses in clinical work with a PhD/postgraduate education		.840								
Taking part in research does not lead to greater professional skill as a nurse		.767								
Nursing research does not raise the status of the nursing profession		.686								
I think the questions in this questionnaire are important		.631				.623				
Proficiency in nursing is primarily attained through long practical experience			.796							
It is not meaningful to get involved in development work in nursing				-.824						
Being involved in development work in nursing should be part of the nurse's job				-.684						
Nursing research is essential for me in my development as a professional nurse				-.563						
Participating in development work in nursing does not benefit nursing skills										
Nursing science and nursing research describes nursing care and makes it visible						.878				
The language of scientific articles is much too complex for me						.818				
The language used in nursing research is too complex										
Nursing research complicates the ordinary work of nursing										
My position as a nurse is sufficiently strong to be able to influence nursing without having knowledge of research						.736				
I think it is interesting to read scientific articles about nursing care										
A PhD for nurses should be a prerequisite for certain senior positions in nursing										
It is self-evident that the nursing profession should be based on scientific and reliable experience										
As a nurse you must be able to read literature in English										
The nursing profession is a practical profession and does not have to include research										
Nurses should take the time to read research reports										
Participating in research should be part of the nurse's job										
Lecturers on the nursing should be a nursing development resource in the workplace to stimulate the development of nursing										
In the nursing area too much is written and there is too much talk about research&development										
Further training in research and research-based studies is not important for the future										
Research literature on nursing should be available at the workplace										.715
We do not need nursing scientists to develop patient care, the practice nurses can do that themselves										.685
The nursing profession does not require research based knowledge to the same extent as the medical profession										
The results of nursing research must be disseminated better to nurses in their work										

Extraction Method: Principal Component Analysis.  
 Rotation Method: Oblimin with Kaiser Normalization.  
 a. Rotation converged in 35 iterations.

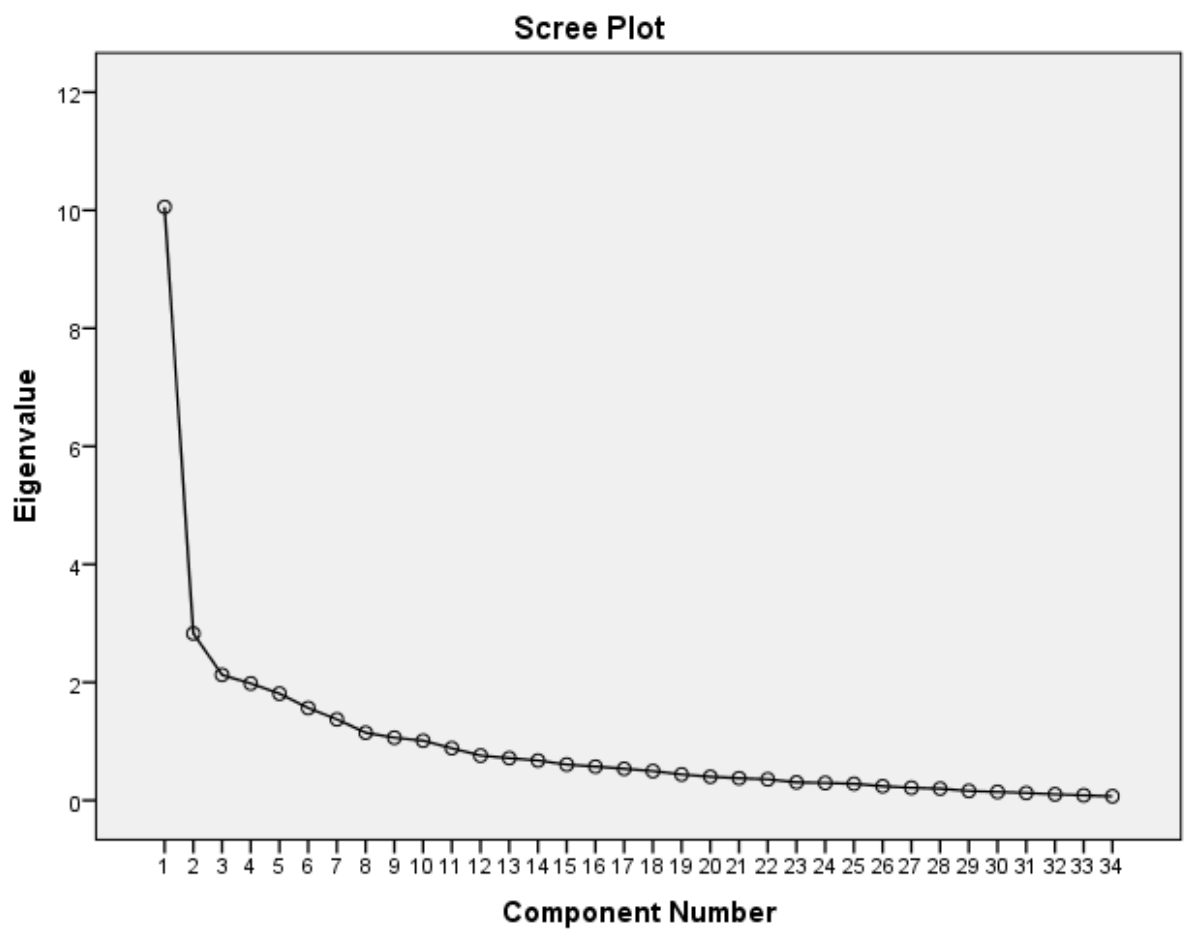
## Appendix 13 The results of parallel analysis

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Component number	Actual eigenvalue from PCA	Criterion value from parallel analysis	Decision
1	10.056	2.3152	accept
2	2.828	2.1307	accept
3	2.127	1.9771	accept
4	1.981	1.8568	accept
5	1.809	1.7638	accept
6	1.566	1.6671	reject
7	1.372	1.5796	reject
8	1.147	1.4869	reject
9	1.063	1.4142	reject
10	1.012	1.3432	reject
11	.883	1.2693	reject
12	.758	1.2022	reject
13	.717	1.1438	reject
14	.676	1.0876	reject
15	.607	1.0231	reject
16	.573	0.9725	reject
17	.535	0.9173	reject
18	.497	0.8667	reject
19	.439	0.8172	reject
20	.400	0.7683	reject
21	.376	0.7229	reject
22	.357	0.6768	reject
23	.305	0.6277	reject
24	.295	0.5875	reject
25	.281	0.5508	reject
26	.239	0.5129	reject
27	.213	0.472	reject
28	.200	0.4332	reject
29	.159	0.3981	reject
30	.143	0.3591	reject
31	.126	0.3222	reject
32	.102	0.2838	reject
33	.085	0.2458	reject
34	.070	0.2045	reject

**Appendix 14 The scree plot, total variance explained, pattern matrix and communalities during the second iteration of factor analysis**

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**Total Variance Explained**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings <sup>a</sup>
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	10.056	29.577	29.577	10.056	29.577	29.577	7.268
2	2.828	8.317	37.894	2.828	8.317	37.894	3.268
3	2.127	6.256	44.150	2.127	6.256	44.150	6.020
4	1.981	5.827	49.977	1.981	5.827	49.977	4.662
5	1.809	5.320	55.297	1.809	5.320	55.297	2.460
6	1.566	4.606	59.903				
7	1.372	4.035	63.938				
8	1.147	3.373	67.311				
9	1.063	3.126	70.437				
10	1.012	2.977	73.413				
11	.883	2.598	76.011				
12	.758	2.231	78.242				
13	.717	2.109	80.351				
14	.676	1.988	82.339				
15	.607	1.785	84.124				
16	.573	1.685	85.809				
17	.535	1.573	87.382				
18	.497	1.462	88.844				
19	.439	1.292	90.135				
20	.400	1.178	91.313				
21	.376	1.106	92.419				
22	.357	1.051	93.469				
23	.305	.898	94.367				
24	.295	.868	95.235				
25	.281	.826	96.062				
26	.239	.704	96.765				
27	.213	.628	97.393				
28	.200	.587	97.980				
29	.159	.469	98.449				
30	.143	.422	98.871				
31	.126	.372	99.243				
32	.102	.301	99.544				
33	.085	.251	99.795				
34	.070	.205	100.000				

Extraction Method: Principal Component Analysis.

a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.



Pattern Matrix<sup>a</sup>

	Component				
	1	2	3	4	5
Participating in research should be part of the nurse's job	.722				
It is not meaningful to devote oneself to research in nursing	.721				
It is unrealistic to believe one can apply research results to practical nursing	.709				
Introducing changes and testing new ideas is very important in the nursing profession	.693				
I do not bother to find out about research results	.688				
I am keen to participate in international scientific conferences	.650				
It is self-evident that the nursing profession should be based on scientific and reliable experience	.612				
Students on the nursing programme are/should be a resource in the workplace to stimulate the development of nursing	.575				
Nurses should take the time to read research reports					
In the nursing area too much is written and there is too much talk about research&development		.768			
Nursing research does not raise the status of the nursing profession		.760			
Taking part in research does not lead to greater professional skill as a nurse		.681			
We should have more nurses in clinical work with a PhD/postgraduate education		.650			
I think the questions in this questionnaire are important					
Research literature on nursing should be available at the workplace			.684		
We do not need nursing scientists to develop patient care, the practice nurses can do that themselves			.670		
The nursing profession does not require research based knowledge to the same extent as the medical profession			.615		
The nursing profession is a practical profession and does not have to include research			.567		
The results of nursing research must be disseminated better to nurses in their work			.558		
Proficiency in nursing is primarily attained through long practical experience					
Nursing research complicates the ordinary work of nursing					
As a nurse you must be able to read literature in English					
Nursing science and nursing research describes nursing care and makes it visible					
Further training in research and research-based studies is not important for the future					
I think it is interesting to read scientific articles about nursing care					
It is not meaningful to get involved in development work in nursing				-.765	
Being involved in development work in nursing should be part of the nurse's job				-.716	
Participating in development work in nursing does not benefit nursing skills				-.601	
Lecturers on the nursing should be a nursing development resource in the workplace to stimulate the development of nursing					
Nursing research is essential for me in my development as a professional nurse					
A PhD for nurses should be a prerequisite for certain senior positions in nursing					
The language of scientific articles is much too complex for me					.743
The language used in nursing research is too complex					.687
My position as a nurse is sufficiently strong to be able to influence nursing without having knowledge of research					

Extraction Method: Principal Component Analysis.  
 Rotation Method: Oblimin with Kaiser Normalization.  
 a. Rotation converged in 31 iterations.

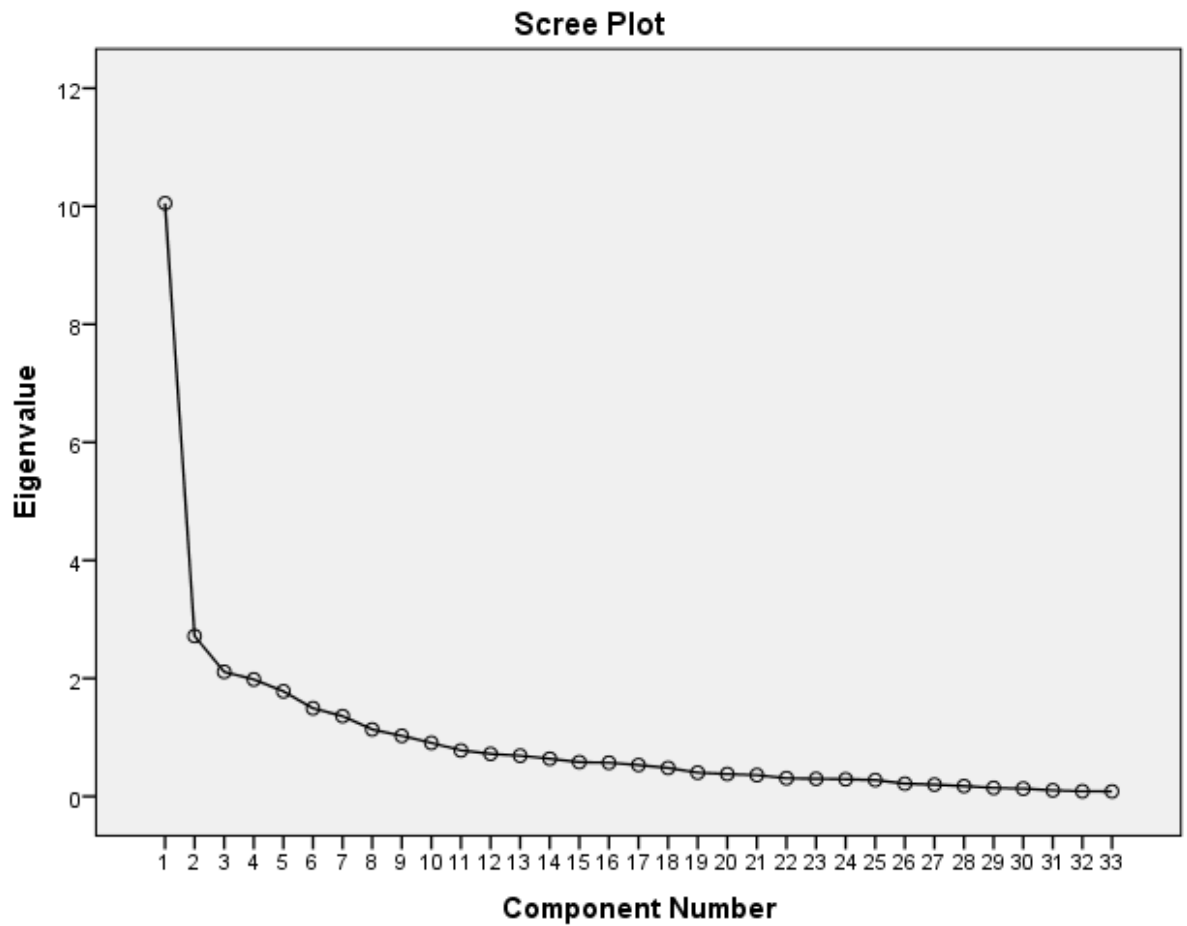
**Communalities**

	Initial	Extraction
As a nurse you must be able to read literature in English	1.000	.411
Participating in development work in nursing does not benefit nursing skills	1.000	.444
In the nursing area too much is written and there is too much talk about research&development	1.000	.273
I think it is interesting to read scientific articles about nursing care	1.000	.459
The nursing profession does not require research based knowledge to the same extent as the medical profession	1.000	.528
Nursing science and nursing research describes nursing care and makes it visible	1.000	.491
The nursing profession is a practical profession and does not have to include research	1.000	.574
Research literature on nursing should be available at the workplace	1.000	.481
The language of scientific articles is much too complex for me	1.000	.674
It is not meaningful to get involved in development work in nursing	1.000	.682
Being involved in development work in nursing should be part of the nurse's job	1.000	.676
We do not need nursing scientists to develop patient care, the practice nurses can do that themselves	1.000	.499
I am keen to participate in international scientific conferences	1.000	.540
Nursing research complicates the ordinary work of nursing	1.000	.632
Lecturers on the nursing development resource in the workplace to stimulate the development of nursing	1.000	.587
Nursing research does not raise the status of the nursing profession	1.000	.697
A PhD for nurses should be a prerequisite for certain senior positions in nursing	1.000	.420
Further training in research and research-based studies is not important for the future	1.000	.445
My position as a nurse is sufficiently strong to be able to influence nursing without having knowledge of research	1.000	.452
The language used in nursing research is too complex	1.000	.708
We should have more nurses in clinical work with a PhD/postgraduate education	1.000	.518
Taking part in research does not lead to greater professional skill as a nurse	1.000	.775
The results of nursing research must be disseminated better to nurses in their work	1.000	.496
Nursing research is essential for me in my development as a professional nurse	1.000	.719
It is unrealistic to believe one can apply research results to practical nursing	1.000	.603
Participating in research should be part of the nurse's job	1.000	.570
Proficiency in nursing is primarily attained through long practical experience	1.000	.631
I do not bother to find out about research results	1.000	.497
Students on the nursing programme are/should be a resource in the workplace to stimulate the development of nursing	1.000	.551
It is self-evident that the nursing profession should be based on scientific and reliable experience	1.000	.491
It is not meaningful to devote oneself to research in nursing	1.000	.698
Nurses should take the time to read research reports	1.000	.489
Introducing changes and testing new ideas is very important in the nursing profession	1.000	.634
I think the questions in this questionnaire are important	1.000	.447

Extraction Method: Principal Component Analysis.

**Appendix 15 The scree plot, total variance explained, un-rotated loadings (component matrix) and communalities during the final (third) iteration of factor analysis**

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**Total Variance Explained**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings <sup>a</sup>
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	10.051	30.457	30.457	10.051	30.457	30.457	7.869
2	2.716	8.231	38.688	2.716	8.231	38.688	3.384
3	2.110	6.394	45.082	2.110	6.394	45.082	2.076
4	1.981	6.003	51.085	1.981	6.003	51.085	3.639
5	1.780	5.394	56.479	1.780	5.394	56.479	6.668
6	1.493	4.524	61.004				
7	1.360	4.121	65.124				
8	1.135	3.439	68.563				
9	1.025	3.106	71.669				
10	.907	2.747	74.417				
11	.779	2.359	76.776				
12	.721	2.184	78.960				
13	.690	2.090	81.050				
14	.639	1.936	82.986				
15	.581	1.760	84.746				
16	.571	1.729	86.475				
17	.532	1.612	88.087				
18	.482	1.461	89.548				
19	.401	1.216	90.764				
20	.378	1.146	91.910				
21	.361	1.094	93.004				
22	.307	.930	93.934				
23	.297	.900	94.834				
24	.290	.880	95.713				
25	.276	.837	96.550				
26	.215	.651	97.201				
27	.200	.607	97.808				
28	.174	.528	98.336				
29	.144	.436	98.772				
30	.132	.399	99.172				
31	.103	.311	99.483				
32	.086	.260	99.743				
33	.085	.257	100.000				

Extraction Method: Principal Component Analysis.

a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Component Matrix<sup>a</sup>

	Component				
	1	2	3	4	5
It is not meaningful to devote oneself to research in nursing	.771				
Nursing research is essential for me in my development as a professional nurse	.766				
Nursing research complicates the ordinary work of nursing	.685				
Introducing changes and testing new ideas is very important in the nursing profession	.666				
It is unrealistic to believe one can apply research results to practical nursing	.664				
Nurses should take the time to read research reports	.658				
Students on the nursing programme are/should be a resource in the workplace to stimulate the development of nursing	.647				
Participating in research should be part of the nurse's job	.643				
Further training in research and research-based studies is not important for the future	.632				
Being involved in development work in nursing should be part of the nurse's job	.625				
I am keen to participate in international scientific conferences	.620				
Nursing science and nursing research describes nursing care and makes it visible	.615				
Lecturers on the nursing development resource in the workplace to stimulate the development of nursing	.605				
The results of nursing research must be disseminated better to nurses in their work	.603				
I think it is interesting to read scientific articles about nursing care	.587				
The nursing profession is a practical profession and does not have to include research	.585				
It is self-evident that the nursing profession should be based on scientific and reliable experience	.583				
I do not bother to find out about research results	.569				
The language used in nursing research is too complex	.550				
The nursing profession does not require research based knowledge to the same extent as the medical profession					
Research literature on nursing should be available at the workplace					
As a nurse you must be able to read literature in English					
We do not need nursing scientists to develop patient care, the practice nurses can do that themselves					
My position as a nurse is sufficiently strong to be able to influence nursing without having knowledge of research					
Taking part in research does not lead to greater professional skill as a nurse		.730			
Nursing research does not raise the status of the nursing profession		.622			
We should have more nurses in clinical work with a PhD/postgraduate education		.583			
Proficiency in nursing is primarily attained through long practical experience					
I think the questions in this questionnaire are important					
The language of scientific articles is much too complex for me					
It is not meaningful to get involved in development work in nursing	.550			-.588	
A PhD for nurses should be a prerequisite for certain senior positions in nursing					
Participating in development work in nursing does not benefit nursing skills					

Extraction Method: Principal Component Analysis.  
a. 5 components extracted.



**Communalities**

	Initial	Extraction
As a nurse you must be able to read literature in English	1.000	.430
Participating in development work in nursing does not benefit nursing skills	1.000	.444
I think it is interesting to read scientific articles about nursing care	1.000	.465
The nursing profession does not require research based knowledge to the same extent as the medical profession	1.000	.523
Nursing science and nursing research describes nursing care and makes it visible	1.000	.511
The nursing profession is a practical profession and does not have to include research	1.000	.575
Research literature on nursing should be available at the workplace	1.000	.493
The language of scientific articles is much too complex for me	1.000	.595
It is not meaningful to get involved in development work in nursing	1.000	.683
Being involved in development work in nursing should be part of the nurse's job	1.000	.678
We do not need nursing scientists to develop patient care, the practice nurses can do that themselves	1.000	.520
I am keen to participate in international scientific conferences	1.000	.541
Nursing research complicates the ordinary work of nursing	1.000	.624
Lecturers on the nursing development resource in the workplaces to stimulate the development of nursing	1.000	.596
Nursing research does not raise the status of the nursing profession	1.000	.693
A PhD for nurses should be a prerequisite for certain senior positions in nursing	1.000	.411
Further training in research and research-based studies is not important for the future	1.000	.476
My position as a nurse is sufficiently strong to be able to influence nursing without having knowledge of research	1.000	.486
The language used in nursing research is too complex	1.000	.684
We should have more nurses in clinical work with a PhD/postgraduate education	1.000	.528
Taking part in research does not lead to greater professional skill as a nurse	1.000	.780
The results of nursing research must be disseminated better to nurses in their work	1.000	.487
Nursing research is essential for me in my development as a professional nurse	1.000	.714
It is unrealistic to believe one can apply research results to practical nursing	1.000	.608
Participating in research should be part of the nurse's job	1.000	.561
Proficiency in nursing is primarily attained through long practical experience	1.000	.653
I do not bother to find out about research results	1.000	.527
Students on the nursing programme are/should be a resource in the workplace to stimulate the development of nursing	1.000	.532
It is self-evident that the nursing profession should be based on scientific and reliable experience	1.000	.481
It is not meaningful to devote oneself to research in nursing	1.000	.697
Nurses should take the time to read research reports	1.000	.528
Introducing changes and testing new ideas is very important in the nursing profession	1.000	.644
I think the questions in this questionnaire are important	1.000	.470

Extraction Method: Principal Component Analysis.





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