A systematic review of psychometric testing of instruments that measure intention to work with older people

Chong Chin Che, Noran Naqiah Hairi & Mei Chan Chong

Abstract

Aims. To review systematically the psychometric properties of instruments used to measure intention to work with older people.

Background. Nursing students are part of the future healthcare workforce; thus, being aware of their intention to work with older people would give valuable insights to nursing education and practice. Despite a plethora of research on measuring intention to work with older people, a valid and reliable instrument has not been identified.

Design. A systematic literature review of evidence and psychometric properties.

Data sources. Eight database searches were conducted between 2006 - 2016.

Review methods. English articles were selected based on inclusion and exclusion criteria. The COSMIN checklist was used to assess instruments reporting a psychometric evaluation of validity and reliability.

Results. Of 41 studies identified for full text review, 36 met the inclusion criteria. Seven different types of instruments were identified for psychometric evaluation. Measures of reliability were reported in eight papers and validity in five papers. Evidence for each measurement property was limited, with each instrument demonstrating a lack of information on measurement properties. Based on the COSMIN checklist, the overall quality of the psychometric properties was rated as poor to good.

Conclusion. No single instrument was found to be optimal for use. Studies of high methodological quality are needed to properly assess the measurement properties of the instruments that are currently available. Until such studies are available, we recommend using existing instruments with caution.

Keywords: instruments, intention, nursing students, older people, psychometric properties, psychometric testing, systematic review
Introduction

Populations around the globe are rapidly ageing. Population ageing poses major challenges for healthcare systems, whereby it has increased the demand for healthcare services to focus on chronic disease, comorbid status and the unique health promotion needs of older adults (Leuven 2012).


A review paper by Neville et al. (2014) identified four key issues explaining why undergraduate nursing students do not view gerontological nursing as a viable career choice. These include societal values about ageing, undergraduate nursing curricula, clinical placement and working conditions in the health sector. Negative societal views affect students’ perceptions of older adults prior to commencing nursing studies and consequently influence their career choice when they graduate. Furthermore, nursing students are given limited exposure to gerontological nursing due to inadequate gerontological theory in nursing curricula and shortage of expert faculty; thus, they lack confidence in their knowledge and skills with regard to caring for older people (Rejeh et al. 2011, Shen & Xiao 2012).

Clinical placements in gerontological nursing have also directly influenced students’ intention to work with older people. The timing and duration of the clinical placement (Williams et al. 2006, Kloster et al. 2007), roles of the mentors (Duggan et al. 2013), appropriateness of clinical placement setting (Brown et al. 2008, McCann et al. 2010, Shen & Xiao 2012, Duggan et al. 2013, Cheng et al. 2015) and proper orientation programs (Robinson et al. 2008) are the determinant factors of intention to work with older people. The aged care sector and hospitals are accountable for their role in the development, mentorship and recruitment of registered nurses and the improvement of working conditions (Neville et al. 2014).

Background

As the population ages, the demand for nursing services in aged care increases. Nursing care is recognized as the largest component of the services required to care for the aged population (International Council of Nurses, 2009). Preparation of future nurses to meet the health needs of older people is a critical concern for the nursing profession. Caring for older people is complex and challenging in terms of the physical, psychological and social needs of patients. As urged by The Royal College of Nursing (2012), older people and their families’ experience of care should be one of safety, dignity and comfort, delivered by staff that have the right knowledge and skills as well as a focus on values and attitudes. Shortage of nurses who have specialized geriatric skills has alarmed the nursing profession; of the 2.56 million registered nurses in USA, less than 1% comprises certified gerontological nurses and of the 111,000 advanced
practice nurses, only 3500 or 3% are gerontological nurses (The John A. Hartford Foundation 2013).

The quality of healthcare services given to the older population is strongly influenced by healthcare providers’ attitudes towards older people (Bernardini Zambrini et al. 2008, Lagacé et al. 2012). Attitude towards older people is the most significant predictor for intention to work with older people (Bernardini Zambrini et al. 2008, Alsenany 2010, Goncalves et al. 2011, Shen & Xiao 2012, Zisberg et al. 2015, Ben Natan et al. 2015). On that account, it is very important to nurture student nurses with positive attitudes towards older people and further promote intention to work with the older population.

An undergraduate curriculum enriched with geriatric content was found to exert a positive influence on student nurses’ attitudes and intentions towards caring for older adults (Hancock et al. 2006). Gerontological nursing content should be introduced through undergraduate nursing programmes, either as a stand-alone course or fully infused into geriatrics curricula or a combination of both (Thornlow et al. 2006). Thornlow et al. (2006) asserts that innovative and interesting gerontological course content taught by enthusiastic and knowledgeable faculty paves the way for the growth of student interest in gerontology.

Based on the Theory of Planned Behavior (TPB), behaviours can be predicted from intentions with considerable accuracy (Ajzen 1988). TPB suggests that human action is influenced by a favourable or unfavourable evaluation of the behaviour (attitude towards the behaviour), perceived social pressure to perform the behaviour (subjective norms) and perceived capability to perform the behaviour (perceived behavioural control). In combination, attitude, subjective norms and perceived behavioural control lead to the formation of a behavioural intention (Ajzen 1991). Therefore, intention to work with older people among nursing students can be used as a proxy measurement of working with older people after they graduate.

A valid and reliable instrument to measure intention to work with older people is critical to evaluate the role of nursing curricula in preparing students to work with older people. On top of preparing students with competencies in geriatrics nursing, it is imperative to inculcate passion for caring and promote intention to work with older people. According to Mokkink et al. (2009), systematic reviews of measurement properties are useful for selecting the best measurement instrument to achieve a specific purpose. Several instruments have been developed to measure intention to work with older people among nursing students. To make a rational choice about the use of these instruments in research or in practice, it is important to assess and compare their measurement properties.

The review

Aims

The systematic review summarizes the psychometric properties of instruments used to measure intention to work with older people among nursing students, to recommend the most suitable intention measurement instrument to educators and researchers and to identify gaps where future testing of psychometric properties is required.

This systematic review answers the following research questions:

- What instruments are used to measure intention to work with older people among nursing students?
- To what extent have the psychometric properties of the instruments been evaluated?
- Which instrument(s) can be recommended to measure intention to work with older people among nursing students?

Design

A psychometric systematic review was undertaken to retrieve published studies of instruments that measure intention to work with older people among student nurses. The review questions, population of interest, intervention, outcome measures and inclusion and exclusion criteria were developed following the PRISMA statement (Liberati et al. 2009). The search and selection process is presented in a PRISMA flow chart (Figure 1).

Search methods

The CINAHL, ERIC, Journal@Ovid, Scopus, PubMed, Google Scholar, MEDLINE and Science Direct databases were systematically searched for literature published between 2006 - 2016. The literature search was performed in October 2016.

The following syntax and limiters were included: (‘intention* to work’ OR ‘work* preference*’ OR willing*) AND (old* OR elder* OR geriatric OR ag*) AND (people OR patient OR person OR adult) AND (‘student nurs*’ OR ‘nurs* student*’) AND (‘instrument’ OR ‘scale’ OR ‘questionnaire’ OR ‘tool’). The search was limited to articles written in the English language and published from 2006 onwards. Citation searching and checking of reference lists was also carried out to locate additional relevant papers. An attempt was also made to identify grey literature (unpublished literature, theses and conference proceedings).
Inclusion and exclusion criteria

Inclusion criteria for the review were studies that:

- aimed to measure student nurses’ intention, preferences or willingness to work with older people,
- used quantitative methodology: cross-sectional, experimental and longitudinal and
- recruited student nurses who were undertaking nursing programmes, both diploma and bachelor of nursing.

We excluded studies that:

- recruited post-registration student nurses, registered nurses or other healthcare professionals, or
- were abstracts or incomplete reports.

Search outcome

The electronic search retrieved 5511 publications written in the English language based on the titles and abstracts of studies. After the review of titles and abstracts, 5416 papers were excluded as they did not meet the inclusion criteria. The search hits were inserted into EndNote X7 and 59 duplicated references were excluded. Thirty-six papers were retrieved and the full texts were assessed for eligibility. The relevance of retrieved literature was matched with the inclusion and exclusion criteria and assessed by first reviewer.

Four additional references from manual searches of reference lists and review articles, as well as one doctoral dissertation from grey literature were included. A total of 41 full text articles were assessed for eligibility by first and second reviewer independently. Five papers were excluded for the following reasons: three were qualitative studies; one was a case study; and one was a study on measuring students’ motivation. Finally, 36 papers were included in the systematic review (Table 1).

The studies selected were conducted in the USA (n = 7), UK (n = 2), Canada (n = 1), Portugal (n = 1), Spain (n = 1), Norway (n = 1), Netherlands (n = 1), Sweden (n = 1), Finland (n = 2) and Australia (n = 4). Several studies were conducted in Asian countries: China (n = 4), Taiwan (n = 2), Saudi Arabia (n = 1), Turkey (n = 1), Jordan (n = 1), Egypt (n = 1), Israel (n = 4) and Sri Lanka (n = 1). Most of the studies (n = 23) were cross-sectional surveys, eight studies

Figure 1 PRISMA flow chart of the search and systematic review process. *Excluded for the following reasons: qualitative studies (n = 3), case study (n = 1), measures students’ motivation (n = 1).
were longitudinal studies, two studies employed experimental design and three studies used a quasi-experimental design.

**Quality appraisal**

The COSMIN (COnsensus-based Standards for the selection of health Measurement INstruments) checklist was used to assess the methodological quality of intention measurement instruments. This checklist is applicable to systematic reviews of measurement properties and measurement instrument selection (Mokkink et al. 2010). The three quality domains of COSMIN are reliability, validity and responsiveness. The COSMIN checklist contains 9 boxes, each dealing with one measurement property,

<table>
<thead>
<tr>
<th>Author (Year)</th>
<th>Country</th>
<th>Study design</th>
<th>No. of participants</th>
<th>Measurement tool</th>
<th>Aspect of validity testing reported</th>
<th>Aspect of reliability testing reported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi et al. (2016)</td>
<td>Taiwan</td>
<td>Cross-sectional survey</td>
<td>612</td>
<td>The Willingness Toward the Elderly Care Scale (Liu 2001)</td>
<td>Content &amp; construct</td>
<td>Internal Consistency</td>
</tr>
<tr>
<td>Koehler et al. (2016)</td>
<td>USA</td>
<td>Quasi experimental, pre- and post-test design</td>
<td>266</td>
<td>Student Perceptions of Working with Older People (SPWOP) scale (Nolan et al. 2006)</td>
<td>None reported</td>
<td>None reported</td>
</tr>
<tr>
<td>Koskinen et al. (2016)</td>
<td>Finland</td>
<td>Quasi experimental, pre and post-test design</td>
<td>87</td>
<td>The Students’ Interest in Nursing Older People Scale (SINOPS) – Self-developed</td>
<td>None reported</td>
<td>Internal Consistency</td>
</tr>
<tr>
<td>Zhang et al. (2016)</td>
<td>China</td>
<td>Cross-sectional design</td>
<td>382</td>
<td>‘Care Willingness to the Elderly Scale’</td>
<td>None reported</td>
<td>Internal Consistency</td>
</tr>
<tr>
<td>Rathnayake et al. (2015)</td>
<td>Sri Lanka</td>
<td>Cross-sectional design</td>
<td>98</td>
<td>Ranking students’ preferences for working with different age groups (7 categories)</td>
<td>None reported</td>
<td>None reported</td>
</tr>
<tr>
<td>Ben Natan et al. (2015)</td>
<td>Israel</td>
<td>Descriptive cross-sectional design</td>
<td>200</td>
<td>Researcher-developed question based on TPB. Students’ intention to work in geriatrics on graduation – 4 items 6-point Likert scale (ranging from 1 = strongly disagree to 6 = strongly agree)</td>
<td>Content &amp; Face</td>
<td>Internal Consistency</td>
</tr>
<tr>
<td>Carlson and Idvall (2015)</td>
<td>Sweden</td>
<td>Cross-sectional and comparative study</td>
<td>183</td>
<td>A single yes/no question: Based on your experience, from this clinical placement in a nursing home, would you consider working with older people?</td>
<td>None reported</td>
<td>None reported</td>
</tr>
<tr>
<td>Zisberg et al. (2015)</td>
<td>Israel</td>
<td>Cross-sectional design</td>
<td>224</td>
<td>‘Would you be interested in pursuing work with the elderly in a hospital or community setting when you graduate?’ 5-point Likert scale (ranging from 1 = I don’t have any intention to 5 = I have every intention)</td>
<td>None reported</td>
<td>None reported</td>
</tr>
<tr>
<td>Ayoglu et al. (2014)</td>
<td>Turkey</td>
<td>Cross-sectional and comparative descriptive study</td>
<td>618</td>
<td>A single yes/no question: Interest in working with older people</td>
<td>None reported</td>
<td>None reported</td>
</tr>
<tr>
<td>Soad Hassan (2013)</td>
<td>Egypt</td>
<td>Descriptive and correlational study</td>
<td>596</td>
<td>Researcher-developed question based on TPB Intent to work with the elderly scale – 14 items 5-point Likert scale</td>
<td>Content</td>
<td>Test-retest correlations</td>
</tr>
</tbody>
</table>
Table 1 (Continued).

<table>
<thead>
<tr>
<th>Author (Year)</th>
<th>Country</th>
<th>Study design</th>
<th>No. of participants</th>
<th>Measurement tool</th>
<th>Aspect of validity testing reported</th>
<th>Aspect of reliability testing reported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haron et al. (2013)</td>
<td>Israel</td>
<td>Cross-sectional design</td>
<td>486</td>
<td>Self-developed a multiple choice question: The respondent’s intention to work in geriatrics: (a) intends to work in geriatrics (b) would consider working in geriatrics after taking advanced specialist training (c) has no intention of working in geriatrics.</td>
<td>None reported</td>
<td>None reported</td>
</tr>
<tr>
<td>Eshbaugh et al. (2013)</td>
<td>USA</td>
<td>Descriptive survey</td>
<td>281</td>
<td>A single question: ‘How likely you will work with older adults in your future careers?’ 5-point Likert scale ranging from 1 (very unlikely) to 5 (very likely)</td>
<td>None reported</td>
<td>None reported</td>
</tr>
<tr>
<td>Gillespie (2013)</td>
<td>UK</td>
<td>Pre &amp; post placement</td>
<td>189</td>
<td>Ranking ‘confidence with various client groups &amp; preference of clinical area in future employment’ 1 (most) to 6 (least)</td>
<td>None reported</td>
<td>None reported</td>
</tr>
<tr>
<td>King et al. (2013)</td>
<td>USA</td>
<td>Longitudinal mixed methods design</td>
<td>80</td>
<td>Measure work site (10) and age group (7) preferences of students (Stevens &amp; Crouch 1998)</td>
<td>None reported</td>
<td>None reported</td>
</tr>
<tr>
<td>Xiao et al. (2013)</td>
<td>China</td>
<td>Cross-sectional study</td>
<td>256 Australian - 204 Chinese</td>
<td>Rank their choices from 9-item ‘Career Choice Questionnaire in Nursing Practice’ (Stevens &amp; Crouch 1998) To provide reasons for their first and last preferences using open-ended questions</td>
<td>None reported</td>
<td>Test-retest correlations</td>
</tr>
<tr>
<td>Bleijenberg et al. (2012)</td>
<td>Netherlands</td>
<td>Longitudinal cohort study</td>
<td>194</td>
<td>A single yes/no question: ‘Do you prefer to work with older people after graduation?’ Working preferences after graduation: pediatrics, psychiatry, community care, hospital or a nursing home.</td>
<td>None reported</td>
<td>None reported</td>
</tr>
<tr>
<td>Alsenany and Al Saif (2012)</td>
<td>Saudi Arabia</td>
<td>Mixed method</td>
<td>566</td>
<td>Perceptions about working with older people (PWOP) (Nolan et al. 2002)</td>
<td>None reported</td>
<td>Internal Consistency</td>
</tr>
<tr>
<td>Gould et al. (2012)</td>
<td>Canada</td>
<td>Mixed longitudinal &amp; cross sectional design</td>
<td>245</td>
<td>Willingness to work with six different age groups (Bernardini Zambrini et al. 2008) 7-point Likert scale ranging from 1 (not at all willing) to 7 (very willing)</td>
<td>None reported</td>
<td>None reported</td>
</tr>
</tbody>
</table>

comprising 5-18 items about design aspects and statistical methods. The nine measurement properties are internal consistency, reliability, measurement error, content validity, structural validity, hypotheses testing, cross-cultural validity, criterion validity and responsiveness (Terwee et al. 2011).
<table>
<thead>
<tr>
<th>Author and Year</th>
<th>Country</th>
<th>Study design</th>
<th>No. of participants</th>
<th>Measurement tool</th>
<th>Aspect of validity testing reported</th>
<th>Aspect of reliability testing reported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Koskinen et al. (2012)</td>
<td>Finland</td>
<td>Descriptive, cross-sectional survey design</td>
<td>183</td>
<td>Researcher-developed questionnaire (82 items) with visual analogue scale (VAS). Students answered each question by marking the point on the 100-mm line which best matched up with their perceptions (0 = strongly disagree, 100 = strongly agree)</td>
<td>Content &amp; Face</td>
<td>Internal Consistency</td>
</tr>
<tr>
<td>Shen and Xiao (2012)</td>
<td>China</td>
<td>Cross-sectional survey</td>
<td>622</td>
<td>Career choice tool (Stevens &amp; Crouch 1998). Rank 9 predetermined practice areas. Open-ended questions. Provide reasons for choosing ‘working with older people’ as the least preferred area.</td>
<td>None reported</td>
<td>None reported</td>
</tr>
<tr>
<td>Swanlund and Kujath (2012)</td>
<td>USA</td>
<td>Cross-sectional survey</td>
<td>50</td>
<td>Preferred work areas ranking (10 areas). Write the reason for their first and last choices. Why they ranked gerontology where they ranked it. Why they liked or did not like working with adults over 65. If there were any factors that would help increase their interest in gerontology.</td>
<td>None reported</td>
<td>None reported</td>
</tr>
<tr>
<td>Henry and Ozier (2011)</td>
<td>USA</td>
<td>Pre &amp; Post intervention</td>
<td>127</td>
<td>A single question: ‘Plan to work with older adults’. Yes/no/not sure.</td>
<td>None reported</td>
<td>None reported</td>
</tr>
<tr>
<td>Lamet et al. (2011)</td>
<td>USA</td>
<td>Quasi-experimental study</td>
<td>70</td>
<td>Students were asked to identify their age group preference (children, middle-aged, or older people) to care for following graduation. A single question on willingness to care for older people with Likert scale 1-7.</td>
<td>None reported</td>
<td>None reported</td>
</tr>
<tr>
<td>Erdemir et al. (2011)</td>
<td>Turkey</td>
<td>Cross-sectional survey</td>
<td>594</td>
<td>A single yes/no question: ‘After graduation, do you have interest to work with the elderly?’</td>
<td>None reported</td>
<td>None reported</td>
</tr>
<tr>
<td>Goncalves et al. (2011)</td>
<td>Portugal</td>
<td>Cross-sectional study</td>
<td>460</td>
<td>A single question: ‘How would you rate your interest in working with older adults?’ 5-point Likert scale ranging from 1 (no interest) to 5 (a lot of interest).</td>
<td>None reported</td>
<td>None reported</td>
</tr>
<tr>
<td>Stevens (2011)</td>
<td>Australia</td>
<td>Longitudinal study</td>
<td>552</td>
<td>Career ranking exercise (10 choices). Qualify their rankings by providing reasons for the most and least popular choices (Stevens and Crouch 1995).</td>
<td>None reported</td>
<td>None reported</td>
</tr>
<tr>
<td>McCann et al. (2010)</td>
<td>Australia</td>
<td>Longitudinal study</td>
<td>232</td>
<td>Career preferences ranking (6 areas).</td>
<td>None reported</td>
<td>None reported</td>
</tr>
</tbody>
</table>
The COSMIN checklist uses a 4-point scale to classify each assessment of a measurement property, where 3 = excellent, 2 = good, 1 = fair and 0 = poor, based on the scores of the items in the corresponding COSMIN box (Terwee et al. 2011). First and second reviewer conducted all quality appraisals independently. Any contentions (which typically arose from vague descriptions) were resolved by discussion until consensus was reached. Third reviewer was consulted when no initial consensus could be reached.

Synthesis
Data synthesis is reported in text, where appropriate, to summarize the findings and content of multiple studies reporting each measurement property. Relevant extracted study data are tabulated to present COSMIN quality ratings and the relevant and comparable psychometric properties are reported (Table 3).

Results
Thirty-six studies, reporting on seven different instruments, were included in the systematic review. The extracted study data are presented in Table 1. Out of nine measurement properties, only four psychometric properties were reported in eight papers (Pan et al. 2009, Alsenany & Al Saif 2012, Soad Hassan 2013, Xiao et al. 2013, Ben Natan et al. 2015, Chi et al. 2016, Zhang et al. 2016, Koskinen et al.
Instruments used to measure intention to work with older people among nursing students

Seven different instruments were used to measure intention to work with older people among nursing students (Table 2).

**Career choice ranking**
Career choice ranking (Stevens & Crouch 1998) is a ranking exercise that requires respondents to rank their career preference for a selection of 10 areas of nursing practice. The ranking task is followed by a series of open-ended questions asking for reasons for their choices. The choices of working areas are paediatrics, mental health, community health, aged care, medical, surgical, intensive care, developmental disability, operation theatre and community mental health.


Several papers (Dekeyser Ganz & Kahana 2006, Henderson et al. 2008, Shen & Xiao 2012, Xiao et al. 2013) stipulated that their study aimed to identify intentions for geriatric nursing practice by adopting ranking procedures as the measurement instrument; hence, the papers are included in the current systematic review.

**Perceptions about working with older people (PWOP)**
Four studies adopted PWOP to assess nursing students’ intentions to work with older people (Brown et al. 2008, Pan et al. 2009, Alsenany & Al Saif 2012, Koehler et al. 2016). Nolan et al. (2002) developed the PWOP tool, which is aimed at exploring the effectiveness of education in preparing nurses to meet the needs of older people and their carers in a multi-disciplinary, multi-agency context. The three-and-a-half year AGEIN (Advancing Gerontological Education in Nursing) project was commissioned by the English National Board for Nursing, Midwifery and Health Visiting, United Kingdom.

PWOP includes three subscales that assess the main construct being measured. To tap into student nurses’ perceptions of working with older people, it was considered essential that any items were grounded in the experiences of students; thus, the questionnaires were generated from interviews and 67 focus groups. Following this process, 15 items were selected which cover three broad areas addressing nurses’ perceptions of: working with older people in general (6 items); intentions to work with older people (4 items); and consequences of working with older people either in terms of future career prospects or job satisfaction (5 items). To all of these items, respondents answered using a 5-point Likert scale to indicate responses from ‘strongly agree’ to ‘strongly disagree’. Psychometric properties of the instrument were not reported.

**The students’ interest in nursing older people scale (SINOPS)**
Koskinen et al. (2012) developed an 82-item instrument that uses a visual analogue scale (VAS) based on extensive literature review. The Finnish instrument aims to examine nursing students’ interest in gerontological nursing and the factors enhancing and decreasing that interest. Eight sum variables were deduced from the 82 items. The sum variables were interest in gerontological nursing (Interest \( n = 12 \)), the characteristics of gerontological nursing (Characteristic \( n = 16 \)), valuation of gerontological nursing

---

**Table 2: Type of intention measurement instruments included in this systematic review.**

<table>
<thead>
<tr>
<th>Type of intention measurement instrument</th>
<th>Number of studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career choice ranking (Stevens &amp; Crouch 1998)</td>
<td>14</td>
</tr>
<tr>
<td>Perceptions about working with older people (Nolan et al. 2002)</td>
<td>4</td>
</tr>
<tr>
<td>The students’ interest in nursing older people scale (Koskinen et al. 2012, 2016)</td>
<td>2</td>
</tr>
<tr>
<td>Self-developed questionnaire based on TPB (Ajzen 1991)</td>
<td>2</td>
</tr>
<tr>
<td>The willingness toward the elderly care scale (Liu 2001)</td>
<td>1</td>
</tr>
<tr>
<td>Care willingness to the elderly scale (Zhang et al. 2016)</td>
<td>1</td>
</tr>
<tr>
<td>Self-developed questionnaire:</td>
<td></td>
</tr>
<tr>
<td>• A ‘yes’ or ‘no’ close-ended question</td>
<td>6</td>
</tr>
<tr>
<td>• Questions with Likert scale</td>
<td>7</td>
</tr>
<tr>
<td>• A single question with checklists</td>
<td>1</td>
</tr>
</tbody>
</table>
(Valuation \( n = 4 \)), the quality of gerontological nursing (Quality \( n = 12 \)), challenging aspects of the field and opportunities for career advancement (Challenges \( n = 10 \)), gerontological nursing education (Education \( n = 12 \)), practical training in gerontological nursing (Training \( n = 6 \)) and the gerontological nursing teacher (Teacher \( n = 10 \)). Students answered each item by marking the point on the 100-mm line that best matched their perceptions (0 = strongly disagree, 100 = strongly agree).

SINOPS consists of 54 items with 27 negative statements and 27 positive statements. It was used in a quasi-experimental study to evaluate the outcomes of the Learning with Older People Programme (LOPP) in terms of nursing students’ interest in older people, attitudes towards older people and knowledge level about ageing (Koskinen et al. 2016).

Self-developed questionnaire based on TPB
Ben Natan et al. (2015) developed a Hebrew 4-item Students’ Intention to Work in Geriatrics upon Graduation and Soad Hassan (2013) developed an Arabic 14-item intention to work with the elderly scale. Both questionnaires are based on the Theory of Planned Behavior (TPB).

The willingness toward the elderly care scale
A study from Taiwan adopted the Willingness toward the Elderly Care Scale to explore Taiwanese nursing students’ willingness to work with older persons (Chi et al. 2016). The scale consists of 15 items and uses a 5-point Likert scale from ‘totally agree’ to ‘totally disagree’.

Care willingness to the elderly scale
A study from China developed the Care Willingness to the Elderly Scale with five items on a 5-point Likert scale to evaluate nursing students’ level of caring for older people (Zhang et al. 2016).

Self-developed questionnaire
Six studies adopted a self-developed single ‘yes’ or ‘no’ close-ended question to survey the student nurses’ preferences or intention to work with older people (Karlin et al. 2006, Hweidi & Al-Obeisat 2006, Bernardini Zambrini et al. 2008, Erdemir et al. 2011, Henry & Ozier 2011, Carlson & Idvall 2015). Seven studies adopted a single question with Likert scale (Lee et al. 2006, Lamet et al. 2011, Goncalves et al. 2011, Gould et al. 2012, Eshbaugh et al. 2013, Ayoğlu et al. 2014, Zisberg et al. 2015). A study from Israel (Haron et al. 2013) employed a single multiple choice question. The students were required to choose from three options to indicate their intention to work with older people.

Dimensions and structure
The instruments varied from unidimensional to multidimensional measures. SINOPS consists of eight constructs, including interest in gerontological nursing, the characteristics of gerontological nursing, valuation of gerontological nursing, the quality of gerontological nursing, challenging aspects of the field and opportunities for career advancement, gerontological nursing education, practical training in gerontological nursing and the gerontological nursing teacher. PWOP covers three dimensions by addressing nurses’ attitude, intention to work with older people and perceived consequences of working with older people. The questionnaire based on TPB measures four dimensions, including attitudes, subjective norms, perceived behavioural control and intention. Unidimensional tools such as Care Willingness to the Elderly Scale, self-developed questionnaires and the career choice ranking procedure consist of one to five items.

Methodological quality of psychometric properties
Four measurement properties – internal consistency, reliability (test-retest), content validity and structural validity were reported by eight papers. None of the papers reported all four measurement properties. Only two instruments underwent reliability and validity tests, namely SINOPS and the Willingness toward the Elderly Care Scale Table 3 presents an evaluation of instruments reporting psychometric properties using the COSMIN checklist. None of the instruments in this review have been investigated for cross-cultural validity, criterion validity and responsiveness.

Validity
Content validity of instruments was reported in five papers (Koskinen et al. 2012, Alsenany & Al Saif 2012, Soad Hassan 2013, Ben Natan et al. 2015, Chi et al. 2016). However, the methodological qualities of content validity were rated poor as the content validity index was not reported and there was no description of the items assessment.

Exploratory factor analysis (EFA) was performed for SINOPS and five factors were extracted. The eigenvalues of these five factors ranged between 11.9 and 2.1, explaining 46% of the total variance in SINOPS, with variances between 15.1% and 5.2%. Low magnitude of factor loading ranged between 0.3 and 0.8. Despite unsatisfactory statistical results, the methodological quality of construct validity for SINOPS was rated good since EFA was carried out with detailed descriptions. The methodological quality of structural validity for The Willingness
toward the Elderly Care Scale (Liu 2001) was rated to be fair as there was no description of how missing items were handled.

Reliability
Reliability of SINOPS was evaluated by internal consistency, with Cronbach’s alpha coefficients for the sum variables ranging between 0.44 and 0.92. Overall, Cronbach’s alpha for SINOPS was 0.89. The methodological quality of internal consistency was rated as good because it has a satisfactory analysis sample and acceptable Cronbach’s alpha values. Despite the fact that Cronbach’s alpha coefficients exceeded 0.7 for both PWOP in Arabic (Alsenany & Al Saif 2012) and Chinese (Pan et al. 2009), the methodological quality was rated poor as the sample size included in the analysis was less than 30 and factor analysis was not performed.

Both the Willingness toward the Elderly Care Scale (Liu 2001) and Care Willingness to Elderly Scale (Zhang et al. 2016) reported internal consistency with Cronbach’s alpha exceeded 0.8; the methodological quality of internal consistency was rated fair as there was no description of how missing items were handled. The methodological quality of internal consistency for Students’ Intention to Work in Geriatrics (Ben Natan et al. 2015) was rated poor even with acceptable Cronbach’s alpha 0.76 ~ 0.87, as only a small sample size was involved in the analysis.

The Chinese version of career choices ranking exercise was adopted by Xiao et al. (2013). The correlation coefficient for test-retest reliability was \( r = 0.93 \) (\( P < 0.001 \)). For this instrument, the methodological quality of reliability is rated poor as the sample size included in the analysis was less than 30 and factor analysis for ranking procedures is impossible. Test-retest reliability was performed in Intent to work with the elderly scale (Soad Hassan 2013) with \( r = 0.93 \). The methodological quality of reliability is rated poor as the sample size was only 10.

Summary
Overall, the methodological quality of measurement properties for the seven instruments was rated as poor to good by the COSMIN checklist. Only SINOPS (Koskinen et al. 2016) achieved a good score on the methodological quality of internal consistency and structural validity.

Discussion
This systematic review identified seven instruments that have been developed to measure intention to work with older people among nursing students. Seven instruments reported on psychometric properties; however, each instrument lacked information on measurement properties. Thus, it has not been possible to draw conclusions to recommend the most suitable instrument for measuring intention to work with older people.

The procedure of ranking preferences about working areas provoked confusion among the students, for instance, student nurses might have interpreted ‘working in nursing homes’ as ‘working with older people’. In fact, ‘working with older people’ and ‘working in nursing homes’ are not synonymous; as evidence, King et al. (2013)’s study revealed that students might have strong preferences for working with older adults but not for working in nursing homes. Generally, the working preferences ranking merely indicate students’ preferred practice areas, rather than truly reflect their intentions towards working with older people. Nevertheless, when the students ranked their preferences for surgical, medical, intensive care unit, community care or psychiatric nursing, they should be fully aware that there

<table>
<thead>
<tr>
<th>Author (year)</th>
<th>Instrument</th>
<th>Psychometric properties assessed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Koskinen et al. (2012, 2016)</td>
<td>The students’ interest in nursing older people scale (SINOPS)</td>
<td></td>
</tr>
<tr>
<td>Chi et al. (2016)</td>
<td>The willingness toward the elderly care scale</td>
<td></td>
</tr>
<tr>
<td>Zhang et al. (2016)</td>
<td>Care willingness to the elderly scale</td>
<td></td>
</tr>
<tr>
<td>Ben Natan et al. (2015)</td>
<td>Students’ intention to work in geriatrics on graduation</td>
<td></td>
</tr>
<tr>
<td>Soad Hassan (2013)</td>
<td>Intent to work with the elderly scale</td>
<td></td>
</tr>
<tr>
<td>Xiao et al. (2013)</td>
<td>Career choice questionnaire in nursing practice</td>
<td></td>
</tr>
<tr>
<td>Alsenany and Al Saif (2012)</td>
<td>Perceptions about working with older people (PWOP)</td>
<td></td>
</tr>
<tr>
<td>Pan et al. (2009)</td>
<td>Perceptions about working with older people (PWOP)</td>
<td></td>
</tr>
</tbody>
</table>

+++ = excellent, ++ = good, + = fair, 0 = poor. Empty boxes denotes not applicable (not tested/reported).
are older people in all these areas. In conclusion, ranking procedures are weak representations of the key concepts detailed in specific research questions in the study of measuring intention to work with older people.

PWOP is a collection of items that comprise different perspectives on one underlying construct; measurements of a construct are formulated based on input from the nursing students. Moule and Goodman (2014) emphasize that in the process of designing and developing instruments, every item in the instrument should give useful information towards answering the research question. The items must be useful in helping to unpack the complexity of a concept. Thus, instead of asking explicitly whether the student has intention to work with older people, it would be better to explore a range of issues which are linked to working intention.

SINOPS is a multidimensional measurement instrument that covers students’ interest in gerontological nursing and the factors enhancing or decreasing this interest. SINOPS is the only instrument rated as good in internal consistency and structural validity, though the authors of the instrument had admitted that the psychometric evaluation of the instrument should be further studied (Koskinen et al. 2016). The recommended average variance expected should be more than 50%, with total variance of 60% (Polit & Beck 2010). Factor loading estimates should be 0.5 or higher (Hair et al. 2006).

Questionnaires based on TPB were informed by theoretical considerations; however, there was no input from the sample population and review of previous literature. Self-developed single item instruments have limited ability to give a deeper understanding of student nurses’ reasons for working intention. Intention is a multi-dimensional concept which requires more than a single question to elicit a meaningful response or enable researchers to reach conclusions. It is impossible to rely on a single-item response for the measurement of intention. Furthermore, close-ended questions restrict the amount and breadth of information collected. Multi-item scales rather than single-item scales are generally used in studies on preference, to avoid bias or misinterpretation and reduce measurement error (Burns & Grove 2012, Bowling 2014).

Gerontological nursing education plays an important role to improve the quality of elderly care by enhancing the geriatric competencies encompassing knowledge, skills and attitudes of the student nurses; ultimately, the goal is that student nurses would be inspired to work with older people after they graduate. As postulated in TPB (Ajzen 1991), intention to work with older people can be used as a proxy measurement of working with older people after they graduate. Nursing educators will be able to evaluate the effectiveness of gerontological nursing curriculum content by assessing students’ intention to work with older people. Thus, it is very important to identify a psychometrically sound instrument to produce accurate data in measuring intention towards caring for older people.

Strengths and limitations

To the best of our knowledge, this is the first systematic review summarizing and appraising the methodological quality of instruments used to measure intention to work with older people among nursing students. As with any systematic review, it is possible that some instruments have been missed in the compilation of relevant studies. Nevertheless, a comprehensive search strategy increased the likelihood that all potentially relevant studies have been included. A clear strength of this systematic review is the fact that it was performed by two independent reviewers and moderated by a third reviewer. This review has also used an appropriate assessment method.

The exclusion of non-English papers may have introduced selection bias. However, most leading journals are in English and research performed in populations with a different native language generally still publishes papers in the English language. Another limitation is posed by the methodological shortcomings. This is common across most studies; for example, small sample sizes in the studies led to indeterminate results.

Given that only a few studies reported psychometric property measurements and most studies have limited evaluation of properties, it is difficult to draw a conclusion on the quality of the instruments. None of the instruments in this review have been investigated for responsiveness. Responsiveness is the ability of the instrument to detect change when change has happened and is vital to gauge the effectiveness of a particular intervention. Nevertheless, psychometric systematic reviews of study instruments are considered scarce in nursing research and this review will give an arena for discussion and exchange of thoughts among nursing researchers.

Conclusion

To keep pace with the rapidly increasing demand for health services dedicated to the aged population, nursing education faces its greatest challenge in equipping future nurses with high competencies, positive attitudes and strong intention to work with older people. Many instruments have been adopted for measuring intention to work with older people among student nurses; nevertheless, our findings imply that studies of high methodological quality are urgently needed.
Psychometric review of intention measurement instruments


References


Funding

The study was funded by postgraduate research grant (PG198-2015A) from the University of Malaya. NNH work is supported by the University of Malaya Grand Challenge Grant (GC001A-14HTM).

Conflict of Interest

No conflict of interest has been declared by the authors.

Author contribution

All authors have agreed on the final version and meet at least one of the following criteria [recommended by the ICMJE (http://www.icmje.org/recommendations/)]:

- substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data;
- drafting the article or revising it critically for important intellectual content.

© 2017 John Wiley & Sons Ltd
interest: preparing university students to work in an aging world. *International Psychogeriatrics* 23(2), 315–321. doi:10.1017/S1041610200001638


The Journal of Advanced Nursing (JAN) is an international, peer-reviewed, scientific journal. JAN contributes to the advancement of evidence-based nursing, midwifery and health care by disseminating high quality research and scholarship of contemporary relevance and with potential to advance knowledge for practice, education, management or policy. JAN publishes research reviews, original research reports and methodological and theoretical papers.

For further information, please visit JAN on the Wiley Online Library website: www.wileyonlinelibrary.com/journal/jan

Reasons to publish your work in JAN:

- **High-impact forum**: the world’s most cited nursing journal, with an Impact Factor of 1·917 – ranked 8/114 in the 2015 ISI Journal Citation Reports © (Nursing (Social Science)).
- **Most read nursing journal in the world**: over 3 million articles downloaded online per year and accessible in over 10,000 libraries worldwide (including over 3,500 in developing countries with free or low cost access).
- **Fast and easy online submission**: online submission at http://mc.manuscriptcentral.com/jan.
- **Positive publishing experience**: rapid double-blind peer review with constructive feedback.
- **Rapid online publication in five weeks**: average time from final manuscript arriving in production to online publication.
- **Online Open**: the option to pay to make your article freely and openly accessible to non-subscribers upon publication on Wiley Online Library, as well as the option to deposit the article in your own or your funding agency’s preferred archive (e.g. PubMed).