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*Little is known of nurses' self-concept in light of their professional identity or as working adults. This article explores the development and rigorous testing of a new self-concept instrument designed specifically for nurses. The new measure is based on the self-concept measurement theory of Shavelson, Hubner, and Stanton. An expert panel was used to critique and aid refinement of the measure. The dimensions of nurses' self-concept were measured in six scales: General Nursing, Care, Staff Relations, Communication, Knowledge, and Leadership. Two groups participated in this study: Group 1 consisted of nursing students prior to graduation (*n = *506) and Group 2 consisted of randomly selected, experienced, working nurses (*n = *528). A series of exploratory and confirmatory factor analyses were conducted to test the fit of a priori models. The results indicate that all scales possess good construct validity and a satisfactory fit with the data.*

How we think and feel about ourselves is fundamental to how we perceive ourselves and also how we perceive our potential in our personal lives. This same idea can be transposed onto our working lives, whereby how we perceive our professional selves will ultimately affect our view of ourselves and associated happiness with what we achieve within our working lives. How nurses perceive themselves within their work environment is cited by nurse academics and authors as a significant source of problems relating to professional identity, recruitment, and retention for nurses.

SELF-CONCEPT AND THE NURSING PROFESSION

The nursing workforce is aging. The question now commonly asked in nursing education worldwide is, Who will replace this workforce? The nursing profession is not currently an attractive proposition in comparison with

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new fields now open to women. At one time people, in particular young women, were attracted to nursing for the opportunity to help and care for people; however, annual recruitment to nursing has been progressively falling, resulting in an alarming shortfall of nurses in health services.

The newly graduated nurse suffers from fragile levels of self-confidence and professional self-worth that can make the difference between continuing with nursing or leaving the profession (Madjar, 1997). Our new nurses are in danger of finding the workplace too stressful and unsatisfying and therefore may be lost to the health system (Brighid, 1998). The combination of graduate loss and diminishing numbers of experienced nurses further heightens the dilemma of nursing shortages. Madjar (1997) contends that the culture shock syndrome of the newly graduated nurse is affected by the level of their self-confidence as much as the concern of a theory/practice gap (p. 2). The "reaction of new graduates to their initial period of employment vary but commonly include physical and specially emotional exhaustion; a sense of inadequacy; frustration; loss of ideals and at the extreme, the abandonment of nursing as a career" (p. 4).

Despite the potential importance of self-concept research for nurses, as well as the knowledge that self-concept is raised as a critical element in the recruitment/retention dilemma, very few nursing researchers have paid more than a cursory interest into this area of research. In fact, to date, nursing theorists have been unable to present a united picture of the constituents for nurses' self-concept. There is, however, strong evidence from nurse researchers that suggests that self-concept has a critical impact on other important mediating employment factors such as job satisfaction, stress, burnout, and attrition (Beeken, 1997; Dewe, 1987; Hackett & Bycio, 1996; Harvey & McMurray, 1997; Moore, Lindquist, & Katz, 1997).

Although the number of nursing authors alluding to the possible importance of nurses' self-concept continues to rise, well-orchestrated and theoretically sound investigations remain rare. In the past 10 years, however, Arthur (1992) reported on the development of a professional nurses' self-concept instrument. As Arthur (1995) states, "Many authors in nursing literature make concerned statements regarding self-concept" (p. 328). Arthur (1992) contends that the importance of self-concept is related to nursing's ability to remain "compatible" with other professionals (p. 712) and claims that the constantly changing landscape of nurses' identity in the health field is a central reason for developing new instruments to identify and measure nurses' self-concept.

Marsh and Craven (1997) point out that historically, self-concept research stagnated because "everybody knows what it is" so that researchers have not

felt it necessary to develop theoretical foundations or psychometric evaluations for their self-concept measures (p. 133). Previous investigations included the view that self-concept is a global or all-encompassing aspect of the self. Key features, such as the hierarchical structure and multiple dimensions or factors, remained hidden and unexplored.

Pivotal work by Shavelson, Hubner, and Stanton (1976) addressed these very issues. The researchers developed a multifaceted, hierarchical model of self-concept that was to revolutionize the underlying fragmented theories of self-concept for future instrumentation. This theoretical model was of such importance that it has provided the prototype for a new generation of self-concept instruments that explore and expand the multidimensionality that now underpins self-concept research.

The new theoretical model developed by Shavelson et al. (1976) incorporated the notion that self-concept is a hierarchical structure with an apex of general esteem at the pinnacle. The hierarchy contains multiple dimensions or facets that become more context specific lower down in the structure. The context-specific dimensions or facets become increasingly stable with age and contain elements of evaluation and description (Bracken, 1996; Byrne, 1997; Marsh, 1987; Marsh & Craven, 1997; Shavelson et al., 1976).

It should be emphasized that the Shavelson et al. (1976) model was a hypothetical one, and that self-concept is not an end in itself but lies between outcomes and mediation with other constructs. Shavelson et al. (1976) and Marsh and Shavelson (1985) raise the critical point that self-concept is a potential rather than an outcome. The self-concept researchers include the notion that dimension or facet development occurs through experience and interpretation of the external world (Marsh & Shavelson, 1985; Shavelson et al., 1976).

Understanding our self-concept is an important goal not just in our formative educational years, but also throughout life. The recent advances in self-concept research have occurred on multiple fronts from the theoretical underpinnings to models and instrumentation. The most significant aspect of these new advances in self-concept research is the current ability to reveal the multidimensional structure and to clarify our understanding of how the domains within the multidimensional structure may link together.

The significance of these major conceptual advances for nursing is that measures can now be constructed that contribute to the growing body of evidence on how discrete these domains within self-concept become in adulthood (Byrne, 1997). A solid theoretical base now exists that can provide a framework to explore and examine the various dimensions of self-concept that arise from a profession such as nursing.

A lack of understanding of the self-concept of graduate nurses is viewed as a potential problem in maintaining our new nursing workforce. If nurses' self-concept can be confidently measured, then further research that focuses on exploring relationships with job satisfaction, retention, and stress becomes realistic. Previous predictors on absenteeism, job turnover, stress, poor job satisfaction, and, ultimately, recruitment and retention have alluded to an incomplete understanding of the psychological constructs of the nurse. An accurate assessment of nurses' self-concept can contribute powerful predictors needed to help solve the puzzle of low recruitment and retention.

At present, nurses' self-concept theory languishes in the grips of earlier theoretical and methodological weaknesses that once plagued the broader field of self-concept research. Nurse researchers have relied on the quick and easily administered global self-concept measures that were the hallmark of prior self-concept research. Previous research on nurses' self-concept has suffered somewhat from atheoretical frameworks and a lack of attention to within-construct issues whereby sound instrument-construct validity and reliability is demonstrated. Studies on nurses' self-concept by Arthur (1992, 1995), Dagenais and Meleis (1982), and Walter, Davis, and Glass (1999) continue to establish the nursing profession's interest in measuring self-concept. There remains a difficulty, however, in establishing a multidimensional approach that incorporates the current self-concept theory.

Contemporary nurse researchers have contributed greatly to the body of nursing knowledge through their research into clinical practices, yet some nurse researchers continue to use theoretically outdated and psychometrically weak measures when researching the identity and self- concept of the nurse. Current self-concept theory offers a chance to investigate the profession of nursing. As Christman (1998) explains, "Nurses are more concerned about *how* and less concerned about *why* than any other professional group" (p. 213). For a profession that is required to be not only technically expert but also psychologically orientated to care for people, any knowledge relating to nurses' self-concept will be crucial for the continued development and growth of the profession.

METHOD

The development of items and dimensions (subscales) for the nurses' self-concept measure began by informal interviews of clinical nurses in Sydney, Australia, over a 6-month period. During the discussions, nurses were

asked to elaborate on areas of nursing that they decided were important to how they thought and felt about themselves as nurses.

Several issues raised were found to be common threads in each discussion. The themes of caring for people and communicating were commonly raised, as well as the need to acquire and utilize nursing knowledge. Leadership issues were raised as a problem with the delivery of nursing care, particularly for newly registered graduate nurses, and as a positive feeling related to taking charge of a critical situation. Other commonly raised issues related to staff relationships, nursing ability, confidence, and esteem.

Six dimensions of importance were extracted from an analysis of interview content. The dimensions of caring, communication, staff relationships, leadership, nursing skills, and knowledge and nursing ability became the categories to develop item pools. This decision was also based on an in-depth review of literature relating to self-concept and prior instrumentation.

The final pool of items contained 80 declarative-type statements in six subscales. A small number (two in each subscale) were negatively worded with the aim of deterring respondent bias (e.g., "I find it difficult to communicate with my colleagues."). An 8-point, forced-choice, Likert-type scale was utilized for the nurses' self-concept measure. Nurses were asked to rate each item on a scale ranging from 1 (*definitely false*) to 8 (*definitely true*).

An expert panel was asked to review and comment on the newly created self-concept measure. The panel consisted of nine people who were deemed by their peers to be sufficiently expert in the area of measurement development, professional nursing, and self-concept. Six people from the expert panel were nursing experts, one of whom is also the author of a professional nursing self-concept instrument. The other three people were self-concept experts.

The expert panel recommended changes to the nurses' self-concept measure such as rewording items that contained triple groupings (e.g., "I get along well with doctors, nurses and other health professionals."). It was felt that the participant might be unable to respond to such items due to differences in these three groups. These items were changed to single groups (e.g., "I get along well with other health professionals.").

The subscale of knowledge and skills was also deemed potentially problematic by the expert panel. Confusion may arise over whether knowledge and skills can be understood as one category or whether the subscale would be measuring two different aspects of nurses' self-concept. The subscale was recast as Knowledge only, with all items reflecting this change. The instrument now consisted of 80 items in six subscales ready for a pilot test.

SAMPLE

Two groups of nurses participated in the development of the nurses' self-concept measure. The participants for Group 1 were in the last semester of the bachelor of nursing program at six universities in the Sydney region. Because the aim was to measure the self-concept of this group again as registered nurses, and many in this group moved from their addresses once they graduated, all universities were approached. Of the students, 506 consented to participate in the study, with 482 providing a follow-up address for Time 2 administration.

The participants for Group 2 were selected from the New South Wales Nurses Registration Board confidential database for 1999. Of the working nurses, 2,000 were randomly selected from a pool of over 45,000 registered working nurses and were invited by mail to complete the survey and return it in a reply-paid envelope. A reminder letter was sent 3 weeks after the initial mail. At the end of 2 months, 528 (26.4%) nurses had completed the survey.

DEMOGRAPHICAL DETAILS

Group 1

Over half of the 506 participants gave their country of birth as Australia (64%), and 163 students came from 55 countries ranging from Afghanistan to Zimbabwe. The mean age of participants was 22 years; however, one quarter of all participants were over 32 years of age. Females dominated the sample at 427 (85%), with 75 (15%) being male. Although 289 (58%) of the students had no nursing experience, over 40% ranged from at least 1 year in the health industry to 27 years as either enrolled nurses (18%) or assistants in nursing (18%).

Group 2

Of the 528 participants in Group 2, most (79%) listed their country of birth as Australia. Of the remaining 21%, the United Kingdom and New Zealand were the most often cited countries. The age of participants ranged from 22 to 79 years, with a mean age of 42.4 years. Most participants were female (94.6%). The mean number of years of experience in nursing was 22, and ranged from 1 to 54 years. Over 64% of the participants stated their

qualifications at the certificate level, and only 18% had obtained a degree in nursing.

Instrumentation

One of the six universities approached for Group 1 provided access for their students to participate only via the Internet. A Web site was constructed using the survey in its entirety, and participants submitted their responses via a secure, encoded e-mail to the researcher. Group 2 participants were also invited to use the Web site. All participants were asked for an e-mail address for Time 2 administration.

Group 1 participants were approached for their cooperation in the study at their universities, and the survey was administered in a group situation. Group 2 participants received a letter of invitation and a survey via a mail-out, and both groups were invited to use the electronic survey. In all cases, however, the ideology of self-report and self-evaluation has not been undermined or altered.

THE PILOT STUDY

A pilot run of the new nurses' self-concept measure was conducted with a group of nursing students who were graduating midyear in 1999 from the University of Western Sydney. The sample size of the group (n = 50) allowed for initial analysis of the six subscales. Exploratory analyses were conducted as well as correlational and reliability analyses on all items and subscales.

The initial reliabilities, although performed on a small sample, were extremely encouraging, with coefficient alphas ranging from .88 to .96 (see Table 1). After a careful review of the correlations, reliabilities, exploratory and confirmatory factor analyses, and in consultation with the Self-Concept Research Centre, the self-concept measure was shortened from the original pool of 80 items to 63.

RESULTS

The underlying a priori structure used to measure nurses' self-concept was encouragingly supported from an analysis of the pilot data. There were,

TABLE 1: Subscale Reliabilities for Each Cut to Nurses' Self-Concept Measure

	Pilot (n = 50)		*Group 1 (n = 506)*		*Group 2 (n = 528)*		*Combined Groups (N = 1,034)*	
Scale	*Cronbach's*	*80 Items*	*Cronbach's*	*63 Items*	*Cronbach's*	*50 Items*	*Cronbach's*	*36 Items*
General	.96	20	.93	13	.91	10	.93	6
Care	.92	12	.91	10	.91	8	.89	6
Staff Relations	.95	12	.92	10	.92	8	.89	6
Communication	.92	12	.92	10	.92	8	.92	6
Knowledge	.88	12	.86	10	.88	8	.83	6
Leadership	.94	12	.93	10	.94	8	.93	6

however, a number of concerns relating to high item and total scale correlations and an unclear proposed factor structure. Model estimates fell well below the desired level of greater than .90 for model fit, suggesting that the pilot model required reestimation. The pilot run of 50 cases could only provide a limited insight into the validity and reliability of the nurses' self-concept measure. This small sample size justified the need to progress cautiously with trimming items. Negatively worded items performed poorly in all analyses of the original 80-item measure and were among the first to be trimmed.

63-Item Measure: Cut One

After careful evaluation of all analyses for the data from the pilot study, it was decided to respecify the nurses' self-concept measure in stages throughout Time 1 application. The original six factors (subscales) as determined theoretically were maintained, although the initial factor analyses showed a mixed result. Of the items, 17 were trimmed across the six factors, leaving a measure of 63 items for administration to Group 1.

An examination of these results revealed an overall improvement in exploratory and confirmatory factor analyses. Model estimations had improved; however, these were still well below the target range of greater than .90. Once again, the decision was made to trim items from all subscales that cross-loaded onto other factors or revealed a higher correlation with a factor other than the theorized factor.

50-Item Measure: Cut Two

Of the items, 13 were trimmed from the previous 63-item, six-factor measure. The first subscale (General Nurse Self-Concept) now contained 10 items. The other five scales contained eight items each. The 50-item version of the nurses' self-concept measure was then utilized for Group 2 administration.

An examination of exploratory and confirmatory analyses again revealed an improvement in factor structure and intra-item correlations. The model estimates continued below target; however, an overall improvement was easily discerned. A number of competing models that still utilized the theoretically based six factors were devised for analysis using modification indices created from structural equation modeling. This technique provided insight regarding which items in which subscales were performing poorly and could be removed to increase model structure. A further trimming of 14 items based on an analysis of these results provided the final adjustments to the nurses' self-concept measure.

Final Version of the Nurses' Self-Concept Measure

The final version contained 36 items in six subscales. All analyses were rerun on individual and combined groups (N = 1,034). The internal consistency, as measured by the use of Cronbach's alpha, remained stable and high despite the gradual loss of items from the original 80 to 36. The subscale of Knowledge was lower than for the previous cuts but remained respectable at greater than .7. The subscale of General Nursing Self-Concept has maintained a very high alpha score throughout the development process.

Differences Between Groups

The final version of the nurses' self-concept measure provided possible total scores of 48 for each subscale and an overall measure total score of 288. By utilizing a comparison of total means and analysis of variance (ANOVA) differences were found in all subscales between Group 1 and Group 2. The greatest difference exists in the subscale of Leadership, where Group 1 was significantly lower (.001) than Group 2 on all six items. Significant differences at the .01 level were found for the subscales of Care, Staff Relations, and Communication (see Table 2).

TABLE 2: Comparing Means and Standard Deviations for Group 1 and Group 2 on Final Model, 36-Item Nurses' Self-Concept Measure (*N* = 1,034)

	Group 1		*Group 2*	
Scale	M	SD	M	SD
1. General	38.59	6.87	39.54	6.12
2. Care	38.84	5.25	41.17	4.09
3. Staff Relations	37.66	5.17	40.28	4.08
4. Communication	37.66	5.42	40.52	4.28
5. Knowledge	37.57	5.22	38.50	5.05
6. Leadership	29.74	7.82	36.04	6.74
Total measure	219.91	29.25	236.05	24.21

Model Development

Each development stage has conveyed insights into the structure and shape of the final 36-item version through statistical analysis and consultation with self-concept measurement experts. The testing of different versions of the nurses' self-concept measure on unequal and divergent groups of nurses has provided a challenge that required careful interpretation of all results. The final model estimates can be seen in conjunction with the previous stages to give an overall view of the developmental changes (see Table 3).

DISCUSSION

Nurses in Group 1 (student nurses) have rated their self-concept in the six subscales in a highly positive manner. This suggests that student nurses expect that they will be comfortable with and confident of how they feel and think about themselves as graduate nurses. Total scores for Group 1 show an even range of scores for all subscales except Leadership. Any exposure to leadership roles is unlikely to have occurred during their nursing course, which may account for the significant difference between Group 1 and Group 2. The lower mean score for Leadership may also highlight the need to incorporate further studies on leadership through the undergraduate course.

Nurses in Group 2 (experienced nurses) have also rated their self-concept in a positive manner, suggesting that experienced nurses are currently comfortable with and confident of how they feel and think about themselves as nurses. Again, Leadership is the lowest of all mean scale scores. This may suggest that nurses are less comfortable with their self-concept in areas

TABLE 3: Goodness-of-Fit Indices (GFIs) for the Nurses' Self-Concept Measure From Initial Pilot to 36-Item Measure

	n	χ^2	df	*GFI*	*TLI*	*RNI*
Model 1	50	2,570.55	3,065	.364	1.340	1.351
Model 2	506	6,099.90	1,875	.609	0.789	0.780
Model 3	528	9,128.43	1,160	.617	0.782	0.769
Model 4	1,034	2,613.74	579	.826	0.852	0.839
Model 5	1,034	787.05	120	.906	0.911	0.887

NOTE: TLI = Tucker Lewis Index, RNI = Relative Non-Centrality Index. Model 1 = 80-item, six-factor measure; Model 2 = 63-item, six-factor measure; Model 3 = 50-item, six-factor measure; Model 4 = 36-item, six-factor measure; and Model 5 = 18 paired items of the 36-item measure.

requiring leadership throughout their careers. There is no significant difference between certificated nurses and those with a bachelor of nursing degree. There is, however, a significant difference between certificated nurses and those participants with master's degrees in nursing. This finding may be related to nurses with master's degrees undertaking leadership roles more often than their certificated counterparts.

The final 36-item, six-factor model demonstrates a reasonable overall model fit, and it would appear from the results of the model testing that nurses' self-concept is indeed multidimensional. The discreteness of dimensions increases with the experience of the nurse as evidenced by an increase in factor structure and model fit for Group 2. Some correlation between scales could be expected based on the Shavelson et al. (1976) and subsequent Marsh and Shavelson (1985) models of multidimensionality in self-concept models. The Staff and Communications scales have continued to be problematic from the initial conceptualization, and are now best represented in the 6-item scales. Perhaps a reason for such problems lies with the fact that nurses may not readily distinguish any differences between communicating with other persons and working together with other persons. A nurse might assume that if he or she is able to relate comfortably in the former, then the latter must also be true.

The development of the nurses' self-concept measure has been deliberately arduous and cautious. Each step in the development has been systematically examined, which helps to further the evidence for strong construct validation. As this is the first trial after construction of the nurses' self-concept measure, confidence has yet to be gained in test/retest reliabilities and model stability for different nurse samples. Interest will center on any changes to the self-concept of Group 1 nurses in Time 2 after they have traversed the

chasm of student to registered nurse. What will be the impact on graduates' self-concept from the health/hospital system?

The development of a multidimensional model of nurses' self-concept is the first step toward utilizing this information about the nursing profession in broader studies. The nurses' self-concept measure is now utilized in a causal study that examines the effects of a positive nursing self-concept on multiple dimensions of nurses' job satisfaction and retention plans.

The creation and development of a new and psychometrically sound instrument to measure nurses' self-concept has national and international application across a broad spectrum of nursing specialties. This project offers a vision for the future by providing the opportunity to evaluate the self-concept of the largest working group within the health care industry. Desirable outcomes for nurses in their graduate year can be the target of programs that support and enhance the graduate's self-concept with realistic goals for workplace reforms. Finally, substantial advances in the theory of discrete factors within adult self-concept can be explored.

NOTE

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