

DEVELOPMENT OF AN INSTRUMENT TO  
MEASURE QUALITY OF NURSES' WORKLIFE

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## LIST OF ABBREVIATIONS

AGFI	Adjusted Goodness of Fit Index
ANA	American Nurses Association
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit index
CVI	Content Validity Index
EFA	Exploratory Factor Analysis
FMLA	Family Medical Leave Act
GFI	Goodness of Fit Index
IDPR	Illinois Department of Professional Regulation
IWS	Index of Work Satisfaction
JCAHO	Joint Commission on Accreditation of Healthcare Organizations
LM	Lagrange Multiplier
NFI	Normed Fit Index
OSHA	Occupational Safety and Health Administration
QNWL	Quality of Nursing Work Life
QNWRU	Quality of Nursing Worklife Research Unit
QWL	Quality of Work Life
RMSEA	Root Mean Square Error of Approximation
RMSR	Root Mean Square Residual
STS	Socio Technical Systems Theory
UAP	Unlicensed Assistive Personnel

## SUMMARY

This study reports the development process and factor structure of a questionnaire to measure quality of nursing work life for registered nurses in hospital settings. Included is information on item generation, content validation, initial pilot testing, and results from the full study.

The instrument was administered to registered nurses in Illinois. Confirmatory factor analysis using maximum likelihood estimation was used to examine the fit of the data with the hypothesized measurement model. Two rival models were also tested. Chi-square ( $X^2(819) = 3,220.70, p < .0001$ ), goodness-of-fit indices (CFI = .48, GFI = .63, AGFI = .60), and parsimony ratios (GFI=.60, NFI=.39) were analyzed for the hypothesized four factor model. The chi-square analysis, fit indices, and parsimony ratios indicated another model would be a better fit. A revised four factor model was estimated based on Lagrange multiplier tests and theoretical considerations.

Chi-square ( $X^2(819) = 3,050.23, p < .0001$ ), goodness-of-fit indices (CFI = .52, GFI = .67, AGFI = .64), and parsimony ratios improved slightly (GFI=.64, NFI=.43) for the revised model and parameter estimate t-tests for all but three items were significant at  $p \leq .05$ . Internal consistency reliability for the final instrument sub-scales included an alpha coefficient of .56 for the 4 item Work life/Home life Scale, (n=265), .58 for the 11 item Work Design Scale, (n=265), .88 for the 21 item Work Context Scale, (n=265), and .49 for the 6 item Work World Scale (n=265). An exploratory factor analysis revealed a two factor solution, but the two factors made little conceptual sense and were not

amenable to being named. Evaluation and recommendations regarding the questionnaire are included.

## CHAPTER ONE

### Problem

Unrelenting pressure to provide more and better service using the same or reduced resources is likely to continue in the healthcare industry for the foreseeable future. Given changes in third-party reimbursement, particularly set amounts for a given diagnosis, increased competition from other health care facilities, and managed care requirements, healthcare organizations need to improve productivity if they are to survive. There are a variety of methods to do this such as use of critical pathways, case management, and disease management; controlling labor costs by changing the mix of care providers, changing staffing ratios (skilled to unskilled); instituting hospital formularies to control costs of prescription medications; group purchasing agreements to take advantage of economy of scale in purchasing supplies; and automated health information management systems for a range of processes from patient order entry to delivering laboratory and diagnostic test results. However, increased production is likely to be short lived if it is achieved at the expense of employee well being. However, when organizations are managed, changed, and redesigned to fully engage employees in the effort to reach organizational goals, it becomes possible to increase productivity without doing it at the expense of the employees.

One way to improve productivity is to start with improving the quality of work life (QWL) for employees (Cummings & Molloy, 1977; Davis & Cherns, 1975; Kanter & Stein, 1985; Sandberg, 1998, Suttle, 1977). The QWL concept

is an approach to the problem of increasing productivity that incorporates human preferences into the design of the organizational system. Empirical evidence suggests that efforts to improve QWL and productivity are achieved through changes in organizational structure (Cummings & Molloy, 1977; Families and Work Institute, 1997; Karasek & Theorell, 1990); communication and feedback (Families and Work Institute, 1997; Friedman, Christensen, & DeGroot, 1998; Marks, Mirvis, Hackett, & Grady, 1986; Schneider, 1985); management style (Cohen, Change, & Ledford, 1997; Families and Work Institute, 1997; Families and Work Institute, 1998; Friedman et al., 1998; Lawler, 1986, Sandberg, 1998); compensation (Cummings & Molloy, 1977; Kopelman, 1985; Lawler, 1986; Lawler & Ledford, 1982); labor relations (Cutcher-Gershenfeld, 1991; Katz, Kochan, & Weber, 1985; Lawler, 1986); job redesign (Beekun, 1989; Cummings & Molloy, 1977; Families and Work Institute, 1998; Friedman et al., 1997; Pasmore, Francis, Haldeman, & Shani, 1982); and greater worker participation (Cohen et al., 1997; Cummings & Molloy, 1977; Families and Work Institute 1997; Friedman et al., 1998; Havlovic, 1991; Marks et al., 1986; Peterson & Tracy, 1992).

Each organization has certain aspects that are unique to its way of measuring the role that improvement of QWL plays in increasing productivity, but all organizations will collect data in the broad categories of human resources outcomes, customer satisfaction, and financial indicators. Organizations found that when they enhanced QWL they also realized a decrease in negative human resource outcomes such as absenteeism,

tardiness, turnover, accidents, grievances, and arbitration (Cohen et al., 1997; Cutcher-Gershenfeld, 1991; Families and Work Institute, 1997; Families and Work Institute, 1998; Havlovic, 1991; Lawler, 1986; Marks et al., 1986; Peterson & Tracy, 1992; Schneider, 1985, Singer, 1999; Witkowski, 1999). Also, reports of customer satisfaction and product quality increased while customer complaints decreased (Cutcher-Gershenfeld, 1991; Katz et al., 1985; Lawler, 1986; Peterson & Tracy, 1992; Schneider, 1985). Finally, financial outcomes improved such as increases in net profit, net income, direct labor efficiency and overall productivity, and cost and fixed overhead decreases (Cohen et al., 1997; Cutcher-Gershenfeld, 1991; Families and Work Institute, 1997; Katz et al., 1985; Marks et al., 1986; Peterson & Tracy, 1992; Schneider, 1985).

Even in light of this evidence, there are researchers such as Golembiewski and Sun (1990a) and Guzzo, Jette, and Katzell (1985) who maintain results suffer from positive-finding bias, flawed research design, uncontrolled contextual factors in organizations, and the type of QWL intervention instituted. Nevertheless, there are adherents to QWL who still maintain that assessing QWL makes it possible to identify those aspects of work that organizational members consider desirable, and which, if modified appropriately, enhance productivity. In fact, instituting multiple QWL interventions to address more than one of these aspects is more likely to increase productivity and employee well-being than a single intervention (Families and Work Institute, 1997; Families and Work Institute, 1998;

Golembiewski & Sun, 1991b; Karasek & Theorell, 1990). A properly designed measure must be used to evaluate the workplace and indicate which aspects of the work environment to modify to enhance productivity.

A multidimensional construct, quality of nurses' work life (QNWL), has been used to describe the interaction of nurses' work life with home life. In addition, QNWL takes into account the design and context of nurses' work, their relationships with the work world, and how these facets interact to affect healthcare productivity measures such as cost, quality, and patient outcomes (O'Brien-Pallas & Baumann, 1992).

Although initial qualitative studies have been conducted to uncover the facets of nurses' work life (Attridge & Callahan, 1990; Villeneuve et al., 1995), no psychometrically tested instrument is available. In other words, the relationship between QNWL variables and productivity remains empirically untested. This inhibits the ability to modify those aspects of work that would improve both nurses' QWL and hospital productivity. In order to improve productivity, chief nurse executives, hospital administrators, and researchers need an instrument designed to identify salient variables that enhance the QNWL and simultaneously provide the information necessary to improve productivity. Methods to improve human resource outcomes, patient satisfaction, and quality and financial outcomes will be needed, and these could be developed using data collected with this kind of questionnaire.

The impact and usefulness of any particular strategy to improve QNWL and productivity is contingent on characteristics of the setting in which it is

used and of the people to whom it is applied. Probably the most important set of factors for determining whether a strategy will be useful in improving the QNWL are the needs of the people involved (Suttle, 1977). Therefore, it is important that QNWL be assessed in terms that nurses identify themselves, rather than in terms identified by managers, administrators, or researchers. For this reason, a measurement tool designed uniquely for registered nurses who work in hospital settings is needed.

#### Purpose

Using raw scores produced by a questionnaire designed to measure QNWL for registered nurses employed as staff nurses, charge nurses, and team leaders in hospital settings, a developed 4-factor model will be estimated and assessed for reliability and validity to determine if the 4-factor model is supported by the evidence.

#### Specific Aims

The specific aims are to (a) examine the factor structure of the QNWL questionnaire by employing confirmatory factor analysis; (b) assess the internal consistency reliability of the QNWL questionnaire using Cronbach's alpha; (c) examine convergent validity if the 4-factor model is supported by the evidence; and (d) explore the factor structure of the QNWL construct by employing exploratory factor analysis if the 4-factor model is not supported by the evidence.

## Significance

The current dynamic healthcare environment requires nurse executives to carefully consider the dimensions of QNWL that will enable their particular organization to survive, adapt, and flourish over time. To accomplish this goal, a method to assess QNWL is needed. Of significance is the lack of clarity of the QNWL construct, the absence of QWL indicators for nurses, and the lack of an instrument to promote consistency in measurement (Robertson, 1990). Nurses' interests and the hospitals' interests overlap in many areas, and these are ideal places to start improvement of QNWL, since many parties—nurse, patient, hospital—stand to benefit. A measurement instrument that focuses on those areas where the interests of nurses and the organization coincide can highlight unrecognized opportunities for improvements in the registered nurse's work life. A questionnaire can also collect data that will suggest strategies to help the organization improve QNWL while simultaneously meeting its goals.

Conventional job satisfaction research focuses on the employee's likes and dislikes and sees the solution to problems as something for management to "fix" (Davis, 1971; Seashore, 1975; Taylor, 1977; Walton, 1975). QWL research, on the other hand, focuses on providing opportunities for employees to make meaningful contributions to their organization. Job satisfaction surveys measure discrete likes and dislikes, while QWL surveys study work place experiences and the work itself and suggest aspects of the workplace or work that could be modified. Job satisfaction is an unsatisfactory construct to assess either jobs themselves or employees' feelings about work (Davis, 1975;

Taylor, 1977). At its core, QWL has two goals: (a) to improve the quality of employees' work experiences, and (b) simultaneously improve the overall productivity of the organization. This dual purpose is less explicit in traditional job satisfaction research and questionnaires used to measure job satisfaction.

Finally, the nursing profession needs long-range strategies to continue to attract new members and retain existing members. "High quality jobs—jobs that offer autonomy, learning opportunities, meaning, and a chance to get ahead—energize employees and win their commitment. Supportive workplaces help employees be more effective workers, people, and parents. Employers who can provide these better quality and supportive workplaces have a clear competitive advantage" (Families and Work Institute, 1997, p. 2). This is what nursing strives to be. Enhancing the QNWL is one means to this end. This study develops an instrument that can be used to identify which aspects of QNWL need to be strengthened, maintained, or changed, and develops a systematic method to evaluate nursing work life.

And as Nunnally and Bernstein (1994) point out, standardized measures are valuable because they are objective, produce quantifiable results, are economical to use, allow consistent communication of findings, and can be used to make scientific generalizations.

## CHAPTER TWO

This chapter begins by offering a conceptual definition of QNWL, describes the theoretical origins of quality of nursing work life, defines the conceptual framework for this study, delineates the nomological net for the construct QNWL by synthesizing related literature, reviews and then analyzes previous attempts to measure both QWL and QNWL, and concludes with a summary and recommendations for next steps.

### Conceptualizing Quality of Nursing Worklife

In the early 1990s, the construct quality of work life was used in discussions of nurses' work concerns. Attridge and Callahan (1990) identified and prioritized the characteristics of a quality work environment as defined by nurses for nurses. Their intent was to reaffirm, modify, or replace as appropriate, characteristics of a quality work environment that until that time focused on other settings. Their aim was to understand the characteristics of a quality work environment from nurses' perspectives. Although nurses shared some of the characteristics of work environments with other types of workers, Attridge and Callahan (1990) enriched the nomological net by adding observations they believed to be distinct to a predominantly female profession.

Since QNWL is a new construct and mapping has only begun, there are still few specific associations for identifying the construct. It is not clear yet which empirical referents are integral and which are not (Efraty & Sirgy, 1990). The literature is filled with empirical referents for QWL, but there is little evidence for what should be included in the multidimensional construct QNWL.

There appears to be a basic set of needs and work environment characteristics that are universally important for all nurses, but the importance of any particular need is not known (Davis & Thorburn, 1999; McGirr & Bakker, 2000). Therefore, the construct validity must be investigated, as this is necessary whenever there is no criterion or unique content that is accepted as an entirely adequate definition of the quality to be measured (Cronbach & Meehl, 1955).

### Conceptualization

The conceptualization of quality of nursing work life used for this study is adapted from Attridge and Callahan (1990) and O'Brien-Pallas, Baumann, and Villeneuve (1994). "Quality of nursing work life is the degree to which registered nurses are able to satisfy important personal needs through their experiences in their work organization while achieving the organization's goals" (O'Brien-Pallas, Baumann, & Villeneuve, 1994, p. 14).

### Theoretical Origins of Quality of Nursing Work Life

Efforts to understand the theoretical underpinnings of quality of nursing work life can be traced back to sociotechnical systems (STS) theory. STS maintains that engaging employees fully in designing work gives them a sense of well-being because they find their work fulfilling, and at the same time it is productive in that it helps the organization reach its goals. By the 1970s Davis coined QWL to describe the work life of employees who worked in settings that used the STS approach (Davis & Trist, 1976).

Since its development in the 1950s at the Tavistock Institute of Human Relations in London, England, STS theory has emerged as a significant approach to designing organizations, especially at the technology and people interface (Trist & Bamforth, 1951). This body of theoretical and empirical work seeks to improve productivity and human enrichment through a design process that focuses on the interdependencies among people, technology, and the environment. In contrast to both traditional and behavioral approaches, which emphasize individual motivation rather than organizational features, STS theory recommends simultaneous modification of technical and social systems to create work designs that can lead both to greater task productivity and to increased fulfillment of organization members (Hackman, 1980).

STS theory views organizations as open and living systems that interact with the environment. This approach emphasizes the fact that organizations are embedded in, and affected by, an outside environment (Chems, 1976; Davis & Trist, 1974; Heller, 1997). Thus, the way in which work is accomplished in any given organization is related to what goes on in its environment, that is, it is inextricably linked to society at large. At the same time, the organization's internal environment has social and technical subsystems, as well as physical design and work settings, which act together to influence and produce the outcome (product or service).

### Social Subsystem

The social subsystem, comprised of the people who work in the organization and the relationships among them, must be able to attain the

goals of the organization, adapt to the environment, integrate the activities of the people in the organization, and provide for continued occupation of the essential roles through recruitment and socialization (Cherns, 1976). More broadly, the social subsystem includes the reasons that organizational members choose to work in the organization, their attitudes toward it, their expectations of it, patterns of supervisory-subordinate relationships, skill levels of employees, and the nature of the subgroups within the population. In short, the social subsystem encompasses all of the human qualities that members of an organization bring with them to work. The STS theorists contend that the surest way to direct the efforts of organizational members toward organizational goals is to identify the needs that people bring with them to the workplace and incorporate the means to meet those needs through the design of the technology and the work itself (Cherns, 1976; Davis & Trist, 1974; Emery, 1983; Emery, 1995; Trist, 1983).

### Technical Subsystem

Similarly, the technical subsystem of an organization consists of the tools, techniques, procedures, skills, knowledge, and devices used by members of the social subsystem to accomplish tasks of the organization. Historically, STS analysis has been applied primarily to organizations employing physical technologies such as coal mining or the automobile industry (Cherns & Davis, 1975; Emery & Trist, 1965; O'Toole, 1974; Trist, 1983; Trist & Bamforth, 1951). White collar and service-oriented organizations have been studied only infrequently (Happ, 1993; Pasmore, Petee, & Bastian, 1986; Song, Daly, Rudy,

Douglas, & Dyer, 1997; Tonges, 1992). The most direct impact of technology is upon organizational productivity; this is not surprising since organizations acquire technology to increase speed and efficiency (Pasmore et al., 1982). In addition however, the technology also affects the location of the workers, the motions required to operate equipment, and the behaviors required to keep the whole system running smoothly. As soon as workers are assigned to operate the technology, that is the equipment, roles and responsibilities develop for those who are designated to manage the equipment and people assigned to operate it.

### Theoretical Assumptions

STS theory is based on two underlying assumptions: (a) organizational performance can be improved by allowing employees at lower levels to assume more responsibility for their efforts and (b) employees will become more responsible and self-directed as their work offers them opportunities to fulfill important psychological needs, such as learning, growth, self-esteem and significance in their working lives (Pasmore et al., 1982). Cherns and Davis (1975) maintain that the major objective of the STS theory approach to organizational change is to jointly optimize the organizational goals and the needs of the employees.

The open-systems approach, in which technical as well as social aspects of the organization are recognized, offers a sound starting-point for studying and (re)designing productive organizations while meeting the needs of employees. Although STS researchers have generally reported positive effects,

for example 87% of the interventions with productivity data show an improvement in productivity (Lawler, 1986; Pasmore et al., 1982), this approach does have its drawbacks (Van Der Zwaan, 1975).

STS theory has been criticized for a lack of coherence between theoretical concepts, ambiguous definitions of social and technical subsystems, unclear boundaries between organization and the environment, and a preponderance of research on the social subsystem that ignores the technical subsystem (Adler & Docherty, 1998; Pasmore, 1988; Van der Zwaan, 1975; Van der Zwaan, 1994; van Eijnatten, 1993). In addition, Beekun's (1989) meta-analysis of 17 sociotechnical studies found that the impact of sociotechnical interventions, although positive, varied greatly across studies. Productivity was moderated by variations in the use of autonomous work groups, changes in the technological system, changes in the pay system, and the scope of the change. But, regardless of the varied and conflicting research findings, quality of work life (QWL) is a construct introduced by Davis (1975) which arose from STS theory to describe the relationship between the social and technical aspects of work and the work-family interface.

Davis (1975) maintained that the quality of work life is improved by allowing employees to assume more responsibility for their efforts while providing opportunities to fulfill important psychological needs, two assumptions underlying STS theory. Therefore, empirical referents of quality of nursing worklife would include both social and technical aspects of work environments. Aspects that address social issues of concern to nurses who

work in hospitals would include: supervisory-subordinate relationships, skill levels of employees, and workers' attitudes and expectations of the work environment. Technical aspects of work include: procedures, skills, knowledge, and equipment. This theoretical discussion provides important clues to empirical referents of the multidimensional construct quality of nursing worklife.

### Conceptual Framework

As with the early efforts of Attridge and Callahan (1990) to define quality of nursing work life, O'Brien-Pallas and Baumann (1992) developed a framework of abstract and general characteristics to describe quality of nursing work life. They attempted to integrate current research about quality of nursing work life into a meaningful whole in order to provide a distinctive frame of reference. This broad framework is depicted in Figure 1 along with the specific characteristics believed to affect the working life of nurses. Table 1 delineates the characteristics depicted in Figure 1. This framework, along with the initial work of Attridge and Callahan was helpful in exploring the multidimensional nature of the construct quality of nursing work life.

Over time, the large and diverse literature and research used to develop the framework in Figure 1 was synthesized into four dimensions of nurses' work life: work life-homelife, work design, work context, and work world (Baumann & O'Brien-Pallas, 1993; O'Brien-Pallas, Baumann, & Villeneuve, 1995). Although not yet empirically tested, it is hypothesized that these four dimensions underlie the structure of QNWL, and they are being used as the

basis for this research.

Within this framework the work life-home life dimension is defined as the interface between the nurses work and home life. The work design dimension is defined as the composition of nursing work and describes the actual work nurses do. The work context dimension is defined as the practice settings in which nurses work and explores the impact of the work environment on both nurse and patient systems. The work world dimension is defined as the effects of broad societal influences and change on the practice of nursing (see Table 2).

### Identifying the Nomological Net

In order to test this framework, the nomological net surrounding the construct has to be identified (Cronbach & Meehl, 1955). Whenever no universe of content is accepted as entirely adequate to define a construct, the empirical referents need to be explicitly delineated to define the construct. Described below is an examination of both the theoretical and empirical quality of work life literature and the literature on the quality of nursing work life that has been examined in order to define the construct. The goal of this review was to uncover empirical referents integral to the QNWL construct.

Following is a description of questionnaire item development and the placement of items within the four dimensions. This organization of items for the questionnaire into four dimensions has two purposes: (a) to ensure exploration of the phenomenon from the perspective of registered nurses; and (b) to determine if empirical referents selected for the questionnaire by the

experts reflect the underlying frame of reference that guided questionnaire development (i.e., the four dimensions). In addition, this study looked for an adequate fit between the data and the proposed four-dimension model. If the data do not fit the model, then the nomological network may be incorrect and require modification.

### QNWL Empirical Referents

The identification and validation of the nomological net are of importance both for theoretical purposes (i.e. for the formulation of theory) and for measurement purposes (i.e. for the development of a questionnaire that allows empirical assessment of QNWL). The construct QNWL can be defined implicitly by a network of relationships—early QWL studies, O'Brien-Pallas and Baumann's (1992) framework, Attridge and Callahan's (1990) qualitative study, and Villeneuve et al. (1995)—until such time that empirical assessment is possible. So as to fairly represent the construct QNWL as presented in the literature and to differentiate it from related theoretical constructs, a precise explication of the empirical referents follows. This explication begins with exploring the QWL concept. The theoretical literature that defined QWL was examined first, followed by empirical literature that attempted to measure QWL. This section is followed by a review of the theoretical literature that defined QNWL, which is then followed by empirical literature that attempted to measure QNWL.

### Theoretical QWL Literature

Although speculative and a priori, Walton (1975) was the first to propose eight dimensions relating to the QWL based on studies of workers and their experiences at work. Walton's approach is comprehensive and so each dimension contains numerous QWL empirical referents, some of which may be interrelated. Walton points out that not all empirical referents will necessarily be uniformly salient for all employee groups and that different sets of empirical referents for different groups of workers are required. Walton's wide-ranging and varied QWL empirical referents are listed in Table 3.

Building on the work of Walton, Taylor (1978) conducted the first empirical examination using factor analysis to investigate the underlying structure of QWL. Twenty-four items representing the dimensions proposed by Walton (1975) were the basis for this questionnaire. Other items were added by Taylor to represent QWL beyond the viewpoint of the individual organization member, that is, from the point of view of the employer and society at large, as recommended by Seashore (1975). A principal components solution for the sample yielded an unrotated general factor accounting for 23% of the total scale variance, while the next four factors together accounted for nearly 25% of additional variance (n=95). Taylor (1978) used a factor loading of 0.385 or greater as the criterion for including specific items. Table 3 lists those items Taylor proposed to define the construct QWL.

Levine, Taylor, and Davis (1984) defined and measured QWL in an insurance company from the perspective of white-collar employees. Furthering

the notion of Davis and Cherns (1975) that different workers have different perspectives on what makes a high quality of working life, these researchers included the employees in the development of a questionnaire. Building on the work of Walton (1975) and Taylor (1978), these researchers formed a Delphi panel of 64 employees to generate a raw list of 590 QWL descriptors. With the assistance of the investigators, a subset of the Delphi panel eventually developed a 34-item QWL questionnaire and a “global” QWL criterion variable. A multiple regression analysis using the 34 QWL items as predictor variables and the “global” QWL criterion identified seven significant predictors of QWL. The seven predictors were: the degree to which superiors treat employees with respect and have confidence in their abilities, variety in daily work routine, challenge of work, present work leads to future opportunities, self-esteem, extent to which life outside of work affects life at work, and the extent to which work contributes to society. The seven significant QWL predictors accounted for 64% (n=450) of the variance in the “global” QWL criterion. Table 3 lists QWL empirical referents delineated in this study.

These empirical referents are expected to correlate and define the construct QWL. A precise explication of the construct QWL is vital for construct validity since it permits tailoring measures so that validating evidence may be properly interpreted (Cronbach & Meehl, 1955). Inferences can be drawn about QWL from the fit between the patterns of data in Table 3. Thus, fair compensation, safe and healthy working conditions, use and development of human capabilities, security, social integration, constitutionalism, favorable

work life interaction with home life, and social relevance of work are contained in the nomological net. This nomological net refers to the pattern of relationships that permit naming the QWL construct (Cronbach & Meehl, 1955).

### Empirical QWL Literature

Numerous other researchers have attempted to measure QWL in a variety of settings. However, there was no single, reliable and valid questionnaire to assess QWL. QWL was operationalized by combining various questionnaires. Used in these studies were measures of job satisfaction (Baba & Jamal, 1991; Efraty & Sirgy, 1990; Igbaria, Parasuraman, & Badawy, 1994; Studt, 1998), organizational commitment (Baba & Jamal, 1991; Igbaria et al., 1994), alienation (Efraty & Sirgy, 1990), job stress (Baba & Jamal, 1991), organizational identification (Efraty & Sirgy, 1990), job involvement (Baba & Jamal, 1991; Efraty & Sirgy, 1990; Igbaria et al., 1994; Studt, 1998), and finally work role ambiguity, conflict, and overload (Baba & Jamal, 1991). Even though multiple measures were used, there is significant overlap between these measures used to operationalize QWL and the theoretical empirical referents used to define QWL in Table 3. Thus, it is logical to conclude that these empirical referents are contained in the construct QWL.

### Theoretical QWL Literature

As described earlier, quality of work life is increasingly being used in discussions of nurses' work concerns. Attridge and Callahan's 1990 study identified and prioritized the characteristics of a quality work environment as

defined by nurses for nurses. Similar to Walton's (1975) eight dimensions, Attridge and Callahan (1990) delineated seven QNWL dimensions that emerged from raw data in their study of 64 Canadian nurses. Using Nominal Group Technique (NGT), a technique used for generating ideas similar to brainstorming, individuals produce ideas in isolation. Then, NGT enables groups to equitably prioritize the ideas produced. In this study, the nurses generated 219 items that described their views of a quality work environment. QWL empirical referents identified by Walton (1975), Taylor (1978), and Levine et al. (1984) (see Table 3) were evidenced in Attridge and Callahan. The QNWL empirical referents from Attridge and Callahan were adequate and fair compensation, safe and healthy working conditions, immediate opportunities to use and develop human capabilities, future opportunity for continued growth and security, social integration in the work organization, constitutionalism in the workplace, fit between work and homelife, and the social relevance of work life. From this raw data, Attridge and Callahan describe seven QNWL dimensions: characteristics of the organization, human and other resources, nature of nursing work, work-related benefits, collegial relationships, self and career development, and acknowledgment of value. Table 4 outlines the empirical referents in these dimensions.

Further qualitative research by Villeneuve et al. (1995) supported the empirical referents of QNWL uncovered by Attridge and Callahan (1990). A Canadian, multi-site descriptive study using focus groups was conducted to uncover the work life concerns of nurses. Raw data were clustered into themes

representing different work life concerns. Of these themes, many appeared across this data in a manner similar to Attridge and Callahan's seven dimensions; this shows that there are empirical referents that overlap in both sets of data that define QNWL. The work life concerns most often described by the nurses in this study are depicted in Table 4. In addition, nurses were asked to prioritize their top five work life issues. These were: concerns about quality of patient care, job security, inadequate staffing, workload, and personal safety.

The multivariate patterns of QNWL data that were obtained in qualitative research will be used to validate the hypothetical scientific construct QNWL. By integrating the QNWL evidence described in Table 4 with the QWL evidence described in Table 3, empirical referents consistently appear that define the construct. Now that the delineation of empirical referents is completed, the next step was to conduct a test of these empirical referents to determine if they reflect the construct. After completing a test of this pattern, it may be necessary to modify the construct as presented (Cronbach & Meehl, 1955).

#### Empirical QNWL Literature

As in QWL, there is no single reliable and valid questionnaire to assess QNWL. Therefore, QNWL was measured by combining various measurement instruments. These studies provide empirical evidence for the referents in the QNWL construct. Used were measures of job satisfaction (Al Ma'aitah, Cameron, Armstrong-Stassen & Horsburg, 1999; Hood & Smith, 1994; Smith, 1981; Smith & Mitry, 1983; Woodcox, Isaacs, Underwood, & Chambers, 1994), organizational commitment (Smith, 1981), job tension (Smith, 1981; Smith &

Mitry, 1983), job involvement (Hood & Smith, 1994), organizational climate (Smith & Mitry, 1983), role stress (Woodcox et al., 1994), and finally, propensity to remain (Al Ma'aitah et al., 1999; Hood & Smith, 1994).

Even though there are multiple measures used, there are similarities between some of the questionnaires used to measure QNWL by these researchers in the studies listed above and the empirical referents contained in Tables 3 and 4. Empirical referents such as: staffing issues, workload issues, concerns about physical or verbal abuse by physicians, patients, or visitors, concerns for personal safety, issues related to availability of technology and equipment, lack of support for continuing education, lack of respect from physicians and administration, and concerns about the ability to provide quality patient care emerge and are contained in the multidimensional construct QNWL.

From these findings then, items were written for inclusion in a new questionnaire to assess QNWL. The empirical referents that overlapped were used as questionnaire items and each item was written using terms appropriate for hospital settings. The four dimensions of the quality of nursing worklife conceptual framework—work life/home life, work design, work context, and work world--derived from O'Brien-Pallas and Baumann's (1992) framework (see Figure 1) were used to guide placement of questionnaire items into the four dimensions. Table 5 describes the four dimensions of quality of nursing work life as defined by O'Brien-Pallas, Baumann and Villeneuve (1995) with related questionnaire items categorized by each dimension. QNWL experts were asked

to validate the placement of items into the appropriate dimension.

#### Previous Attempts to Measure Quality of Work Life

No single questionnaire is available to assess QNWL. But there are published questionnaires designed to measure QWL for other workers. The following section will offer a critical analysis of existing QWL measures, that will lend support for the development of a new QNWL questionnaire.

Significant theoretical and empirical effort has been devoted to understanding the nature and effects of enhancing quality of work life (Table 6), however relatively little effort has been devoted to questionnaire development. There have been questionnaires that purported to measure QWL for teachers (Pelsma et al., 1989), white-collar insurance company employees (Levine et al., 1984), engineers and data processing managers (Taylor, 1978), and federal employees (Boisvert, 1977; Nachmias, 1988). Only one questionnaire has been used to assess QWL in a variety of different work settings, with a variety of workers (Sashkin & Lengermann, 1984). But in this empirical work, the relationship of questionnaire items to theory, initial conceptualization of the construct, operationalization of QWL in terms of initial domain specification and item generation, the methods used to establish content validity, and initial reliability and validity data are not sufficiently documented to allow the reader to assess the adequacy of the questionnaire. Likewise, the particular populations studied and the contexts used are inappropriate for registered nurses because registered nurses and hospital settings were not used in developing these questionnaires.

Even though the construct QWL arose from STS (Davis, 1975), few researchers have used this theory to guide questionnaire development. Many of the published empirical examinations of the underlying dimensions of the construct are without a relationship between theory and the items on the measure (Nachmias, 1988; Pelsma et al., 1989; Taylor, 1978). Likewise, Levine et al. (1984) and Boisvert (1977) imply the use of STS in the development of their questionnaires, but a description of STS theory is not included, so only those familiar with STS theory are able to determine that the items on the questionnaire were derived from STS theory. The questionnaire designed by Sashkin and Lengermann (1984) was based on classic sociological analysis of the relation between work and workers in society, in terms of alienation and self-estrangement. As demonstrated above, missing is a correspondence between sociotechnical systems theory and the items included on these measures.

Conceptualizing and operationalizing the construct QWL has also proven to be problematic. Most authors describe the construct QWL as multidimensional and it has been conceptualized as: a list of qualities with both individual and collective components (Taylor, 1978); the relation between alienating job conditions and workers' self-estrangement (Sashkin & Lengermann, 1984); a way to improve working conditions by decreasing stress, burnout, and job dissatisfaction (Pelsma et al., 1989); and as an individual's reaction to different work situations (Nachmias, 1988). Two researchers stated that the construct was not well defined and that their work was intended to fill

this void (Boisvert, 1977; Levine et al., 1984). With such varied and ambiguous conceptualizations (see Table 7) it is not surprising that operationalization of the construct has been problematic.

Since the initial domain specification was unclear, the manner in which items were generated for these instruments is questionable. In most cases, questionnaire items were selected from published QWL studies or researchers identified particular empirical referents as relevant to the domain (Boisvert, 1977; Nachmias, 1988; Pelsma et al., 1989; Saskin & Lengermann, 1984; Taylor, 1978). Content validity was not reported in any of these studies, but one study mentioned that the questionnaire developed for the study had face validity (Nachmias, 1988). Many researchers agree that employees should provide data in their own language and meaning that can be used in developing a questionnaire to assess QWL for specific segments of the working population (Boisvert, 1977; Davis, 1975; Levine et al., 1984; Suttle, 1977; Taylor, 1978). Only one study used 64 employees in a Delphi panel to generate a raw list of 590 QWL descriptors (Levine et al., 1984). The Delphi panel is a multi-iteration approach used as a means of effecting group consensus of opinion (Polit & Hungler, 1999). With the assistance of the investigators, a subset of the Delphi panel eventually developed a 34-item QWL questionnaire. As demonstrated here, defining the domain of QWL and selecting questionnaire items generally lacks meaningful scientific rigor.

In this same group of published studies, reports of psychometric data vary considerably. To begin, test-retest reliability is reported in only one study

( $r = .56$ ), with re-testing completed one year after the initial data collection (Pelsma et al., 1989). But the intent of this retesting was to assess the stability of the construct, rather than to test the stability of the construct in the typical 14 day re-test fashion (Knapp & Brown, 1995). Second, Boisvert (1977) and Levine et al. (1984) explained 59% ( $n=155$ ) and 64% ( $n=450$ ) of the variance in a “global” QWL criterion with seven and eight QWL predictors using multiple regression. Third, while four studies used exploratory factor analysis with orthogonal rotation to assess construct validity, with the variance explained ranging from 47% in five factors to 66% in 10 factors (Nachmias, 1988; Pelsma et al., 1989; Sashkin & Lengermann, 1984; Taylor, 1978), no type of validity data were reported in three studies (Boisvert, 1977; Levine et al., 1984; Nachmias, 1988). Fourth, Pelsma et al. (1989) attempted to demonstrate discriminant and convergent validity of their 36-item, expert developed questionnaire, Quality of Teachers' Work Life Survey. Using a separate instrument designed to measure a different construct (Education Values Scale), an instrument designed specifically to measure the values of those working in educational settings, they demonstrated little commonality across the two constructs ( $r = .08$ ). Also in this study, the researchers assumed that stress and burnout were constructs related to QWL, so they used the Maslach Burnout Inventory to establish tentative support for convergent validity ( $r = .40$ ). Finally, one study reported internal consistency reliability for the scale as a whole ( $\alpha = .92$ ) rather than reporting the alpha for the sub-scales (Sashkin & Lengermann, 1984), while Taylor (1978) reported internal consistency reliability

for his five factor sub-scales (alpha .71 to .85) and "acceptable item to total correlations for all items and factor scales" (p. 159). No one questionnaire reported content validity, test-retest reliability, sub-scale internal consistency reliability, item-to-total correlations, and evidence of construct validity.

Finally, the environments in which these instruments were intended to be used included schools, federal bureaucracies, and for-profit companies rather than healthcare settings. In addition, these subjects were engineers, computer system analysts, computer and machine operators, insurance industry white collar employees, and federal employees, and unlike registered nurses, were predominantly male (although one study used elementary and junior high school teachers who were 75% female). While a reasonable argument of the need for a new questionnaire can be based on the inadequacies of context and subjects alone, a stronger case has been made for a QNWL questionnaire based on the theoretical and psychometric inadequacies described above. Furthermore, the studies in nursing mentioned earlier (Hood & Smith, 1994; Smith, 1981; Smith & Mitry, 1983; Woodcox et al., 1994) did not use a questionnaire to assess QNWL, but rather combined existing questionnaires to measure the construct.

### Summary and Conclusions

The QNWL questionnaire developed in this study remediates the aforementioned deficiencies as it has been developed from a sound theoretical base so that the correspondence between STS theory and the questionnaire items are obvious. Likewise, the four dimension conceptual framework that

guided questionnaire development (work life/home life, work design, work context, and work world) contain empirical referents of quality of nursing work life that include both social and technical aspects of work environments. In addition, a rigorous delineation of the empirical referents (nomological net) has been completed after thoroughly examining the published literature. Those empirical referents that overlapped were used as questionnaire items. A strength of this questionnaire is that the items are from the perspective of registered nurses employed in hospital settings. Some maintain that greater amounts of variance can be understood when input from workers is used when designing a questionnaire, rather than QWL questionnaires designed solely by experts (Boisvert, 1977; Levine et al., 1984). Also, items selected to be included on the QNWL questionnaire were assessed by experts for relevance to the dimensions in order to establish content validity and the context and subjects are specific to the intended population. Finally, tests of reliability and validity were conducted.

Though occupation specific questionnaires have the disadvantage of limiting comparisons across occupations, they have the important advantage of better delineating the items most relevant to the particular occupation. Thus, occupation-specific questionnaires that include sub-scales and items that are specifically tailored to a particular profession can provide valuable information in a particular setting. Since the cumulative findings on how to define and measure QNWL are disappointing, developing a questionnaire to measure QNWL and examining the underlying factor structure is needed.

## CHAPTER THREE

### Questionnaire Development Process

#### Item Generation

A search of the CINAHL (Cumulative Index of Nursing and Allied Health Literature), MEDLINE, HEALTH (Health Reference Academic), PsychINFO (Psychological Information), ERIC (Education Resource Information Center), SSI (Social Science Index), HAPI (Health and Psychology Instruments), Dissertation Abstracts, and Behavioral Current Contents databases was completed using the search terms quality of work life and quality of working life produced over 200 citations. Reports of studies that implemented quality of work life programs, articles on how-to implement a QWL program, and articles offering suggestions on improving the quality of work life were not used for questionnaire development. The seven articles that focused on defining quality of work life, in particular the quality of nurses' work life (QNWL), were most useful for this research. Major QNWL sources were Attridge and Callahan (1990), O'Brien-Pallas et al. (1994), O'Brien-Pallas and Baumann (1992), and Villeneuve et al. (1995). Sources of quality of work life include Taylor (1978), Walton (1975), and Levine et al. (1984).

After reviewing each article for empirical referents for QWL and QNWL, the questionnaire items were written using common sense semantics guidelines: (a) strive for clarity, and (b) avoid emotionally-laden words, ambiguity, and wording that prompts respondents to give a particular answer (Waltz, Strickland, & Lenz, 1991). Some items were modified from existing QWL

questionnaires with language appropriate to nursing work life in hospital settings, while some items were created new from the empirical referents contained in the qualitative QNWL research studies. The original pool of items were then subdivided into the four subscales from the conceptual framework (Table 2): work life/home life (n=14), work design (n=13), work context (n=36), and work world (n=8) for a total of 71 items. The original 71 items were assessed for content validity by a panel of QNWL experts convened for this purpose.

### Content Validity

Content validity refers to the match of the instrument with the domain being measured (Nunnally & Bernstein, 1994). Content validity was assessed following Lynn's (1986) guidelines. Experts were asked to assess each item to determine if it was part of the domain and if it was clear and accurate. The experts were then asked to place the item in one of the outlined dimensions of QNWL (see Appendix A).

A panel of seven experts was assembled to review the items (Appendix A). Judge A is a doctorally prepared researcher affiliated with the Quality of Nursing Work Life Research Unit (QNWRU) at the University of Toronto with extensive publications in the content area. Judges B and C are doctorally prepared researchers and co-directors of the QNWRU. Judge D holds a master's degree in nursing and has published extensively in the content area. Judge E holds a master's degree in nursing and has conducted a qualitative study to determine nursing work life factors. Judge F holds a master's degree

in nursing and also participated in the qualitative study data collection with Judge F. Judge G is doctorally prepared and has expertise in instrument development.

Each judge was asked to rate the relevance of each of the 71 items using the following scale: (1) item not relevant to QNWL domain, (2) unable to assess relevance without item revision, (3) item is relevant but needs minor revision, or (4) item is very relevant. An invitation to comment and recommend additional items was included. Rating an item as (1) or (2) indicated rejection of the item; ratings of (3) or (4) indicated acceptable items. The content validity index (CVI) for each item is determined by the proportion of experts who rate each item as content valid (a rating of 3 or 4). Of the 71 items submitted to the content experts, 31 items were retained that had a CVI of 1.00 (all seven experts gave these items a rating of 4, very relevant). These 31 items were retained unchanged or were slightly revised to improve clarity as suggested by the experts. Ten items, each receiving ratings of 3 or 4, were also retained (CVI .85). While these ten items were relevant to the domain, some of the items needed minor revision. Item rewording was completed as suggested by the experts. The relevance of these ten items was further supported by qualitative research data from interviews with registered nurses (Villeneuve et al., 1995). Two additional items were added that consistently appeared in the qualitative data even though the content experts did not assess the items' relevance. The other 30 items were deleted for lack of relevance (n=21) or redundancy (n=9). (The experts rated these items 1 or 2.)

Although the placement of items into dimensions is not described by Lynn (1986), the experts were asked to place each of the 71 items into one of the four dimensions: work life/home life, work design, work context, and work world. The experts showed considerable disagreement about the placement of items in the work design and work context dimensions as evidenced by CVIs ranging from .57 to 1.00. This variation occurred even when the item was rated highly relevant (rated 3 or 4). One expert maintains that the definitions of the work design and work context dimensions may not have been robust enough to force an item into one dimension or the other (A. Baumann, personal communication, May 10, 1995). In the case of the work life/home life and work world dimensions, there was greater agreement among the experts on the dimensions for these items. The final 43 items represented the dimensions as follows: work life/home life (n=8), work design (n=10), work context (n=20), and work world (n=5). Each item was attached to 6-point Likert-type scale ranging from disagree to agree. One item (item 20) is negatively worded and reverse scored. The scoring scale is intended to indicate a high QNWL at the agree end of the scale and a low QNWL at the opposite end. The items classified by dimension are in Table 5.

#### Pre-testing the Instrument for Clarity

To pretest for item clarity, the researcher solicited a convenience sample of 12 staff nurses to complete the instrument in a group setting with the investigator in attendance. Participants were asked to follow the written directions to complete the instrument. No additional verbal instruction was

provided. Time necessary for completion ranged from 9 to 13 minutes. None of the participants was familiar with the concept of quality of nursing work life.

When all participants were finished, the instrument was reviewed with the group on an item by item basis. Participants were asked specific questions about adequacy and specificity of the directions, item clarity, item complexity, and difficulty. This group reported no difficulty in these areas. All 43 items were retained. The questionnaire ranked at a seventh-grade reading level using the Flesch-Kincaid formula (Microsoft, 1994).

#### Pilot Test

The 43-item questionnaire was administered to a convenience sample (n=58) of registered nurses, employed on a variety of hospital units who are either MSN students or registered nurses enrolled in a BSN degree completion program. For the pilot test, an a priori decision was made to allow Not Applicable as a response choice for six items asking about child care, elder care, rotating schedules, and the use of unlicensed assistive personnel (items 1, 10, 20, 27, 36, 43) as these items may not be applicable to every nurse or unit. A Not Applicable response column was then added to the questionnaire for all items. As suspected, four items were not applicable to many of the pilot test subjects (items 10, 20, 27, and 36). Unexpected was the number of Not Applicable responses (60%, n= 35) to item 37 which asked if the nurse “brought work home.”

In the pilot test, two sets of data (Time 1 and Time 2) were generated for the test-retest reliability estimates. In general, small differences in item

statistics should be expected simply because of measurement error. Strickland (1999) recommends using Time 1 data because the Time 1 data are not affected by testing effects resulting from repeated measurement (O.L. Strickland, e-mail communication, May 5, 1999). Therefore, the pilot test results reported here are from the Time 1 data.

### Data Coding

Data from the pilot test were coded in the following manner: Not Applicable responses were coded "0" and missing data was coded "9." The purpose for coding data in this manner was to distinguish Not Applicable responses from missing data in order to be able to distinguish between types of missing data. A Not Applicable response was interpreted as a valid response and the score for this response was coded as zero. Some maintain the best way to handle a Not Applicable response is to determine the mean for that item for all of the respondents and then assign that mean value to the item the respondent answered Not Applicable. Other researchers do not agree with this method of mean importation and prefer the subject is dropped from the analysis. While others will use zero as the value for Not Applicable in the item statistics as was done in this pilot test. There are a number of various ways to handle missing data with proponents and detractors for each method described above (Polit & Hungler, 1999).

Coding Not Applicable responses as zero proved problematic in the total scale score as the number of total items applicable to any one subject fluctuated based on the content of the item and that respondent's particular

situation. Likewise, the small sample size in the pilot study (n=58) may have also affected mean scores for each item and item variance. Therefore, all the pilot test findings were interpreted with caution. The removal of the Not Applicable response column from the final questionnaire is discussed later in this section.

Item 20 was negatively worded. The use of negatively worded, reverse-scored items has stimulated much discussion and there are strong proponents both for and against the use of such items (Hinkin, 1998). If negatively worded, reverse-scored items are used, the researcher should pay careful attention to factor loadings and communalities at the factor analytic stage of scale development (Schriesheim et al., 1999). At this pilot test stage, data transformations were handled by instructing the computer to reverse the scores on item 20.

#### Pilot Test Data Analysis

Pilot test data analysis was conducted using SAS for Windows software (SAS, 1999). The subjects were primarily white (94%), female (100%), between 26 and 65 years of age (73%), and 29% had completed their BSNs. Following Nunnally and Bernstein's (1994) and Polit and Hungler's (1999) recommendations, the pilot test sample was similar to the group with which the final questionnaire was used.

#### Item and Scale Data

If the majority of subjects score in a similar manner on an item, the item ranges and standard deviations will be low and item scores are likely to be

either positively or negatively skewed. If items do not discriminate between respondents in the pilot test sample, then they might not be ideal items and should be eliminated from the instrument (Strickland, 1996). Means and standard deviations for the items are contained in Table 8.

The purpose of having a composite scale score is to discriminate quantitatively about the quality of work life for staff nurses in hospital settings (Polit & Hungler, 1999). The total possible scale score for the 43-item questionnaire was intended to range from 43 to 258 (no pilot study respondents circled Not Applicable for every item). A low total scale score indicates a low quality of nursing work life, while a high total scale score indicates a high quality of nursing work life. In this way, the researcher is able to obtain total scale scores and sub-scale scores for a group of staff nurses in a particular setting which facilitates diagnosing the current state of nursing work life in that particular setting. However, including a Not Applicable response column on the pilot test questionnaire inhibited the interpretation of scale scores and the questionnaire's ability to diagnose a particular setting. Because respondents' hospital setting and life circumstances varied, the number of items each respondent answered fluctuated. Pilot test total scale scores ranged from 103-150, but interpretation of these scores was difficult since subjects' answered a different number of items. For this reason, items were reworded as described in a subsequent section to eliminate the need for the Not Applicable response column on the final questionnaire. This rewording also eliminated the need to use mean importation for Not Applicable responses. In this way,

obtaining a total scale score for each respondent was possible to facilitate diagnosing the quality of work life in a particular setting.

### Test-Retest Reliability

The questionnaire was administered 14 days apart to the sample of 58 described above. A total of 53 matched sets (91%) of responses were received. Five subjects did not complete the questionnaire at Time 2. A review of the raw data indicated that each of the 53 respondents answered every item at Time 1 and Time 2 and that respondents marked the same items as Not Applicable items Time 1 and Time 2. As described above, the Not Applicable responses were assigned a score of zero. The test-retest reliability coefficients were: Work life/home life dimension  $r=0.50$ , Work design dimension  $r=0.89$ , Work context dimension  $r=0.89$ , and Work world dimension  $r=0.90$ . The higher the correlation coefficient, the more stable the instrument is assumed to be (Waltz et al., 1991).

### Item Analysis

Psychometricians recommend at least 200 normative subjects be used to provide sufficient stability to the calculations used when conducting item analysis (Nunnally & Bernstein, 1994; O.L. Strickland, e-mail communication, April 12, 1999). According to Nunnally and Bernstein (1994), item analysis plays an important role in construct validation in that it can facilitate the selection of the “best” items to be used on the final version of the questionnaire. The pilot test sample size was small ( $n=58$ ) and for this reason elimination of any items should proceed with caution and be based on all of the

item statistics for that item (O.L. Strickland, e-mail communication, April 12, 1999).

As suggested by Strickland (1996), item summary statistics, inter-item correlations, corrected item-to-total correlations, and alpha if an item is deleted were calculated. Item summary statistics, corrected item-to-total correlations and alpha if an item is removed are included in Table 8.

### Inter-item Correlations

Item analysis continued by reviewing inter-item correlations using a correlation matrix for the data at Time 1. Inter-item correlations indicate that the items have something in common, which is a key assumption of the domain-sampling model used here to guide item generation. All items belonging to a common domain should have similar average inter-item correlations (Nunnally & Bernstein, 1994; Waltz et al., 1991). Low correlations may indicate that those items are not from the appropriate domain. Such items then produce error and unreliability and may need to be eliminated from the questionnaire. Inter-item correlations ranged from  $r=.00$  to  $.81$ . Knapp and Brown (1995) believe that whether or not inter-item correlations should be between  $.30$  and  $.70$  depends on the number of items and the number of underlying dimensions. Conversely, Kim and Mueller (1978) maintain that when inter-item correlations are less than  $.40$ , those particular variables may be deleted from the analysis. The other consideration for inter-item correlations is a concern for similarity among the items. Items should not be correlated so highly that they index redundancy. In this pilot test the largest inter-item

correlation was  $r=.81$  between item 27 and item 33. Although some psychometricians consider items redundant when correlations are .70 or above, Strickland (1996) maintains that “items can not be assumed to be truly redundant unless their correlation with another item is .90 or above” (p. 4). Since no items achieved a correlation greater than .90, no items were eliminated for redundancy.

#### Corrected Item-to-Total Correlations

Corrected item-to-total statistics provide an indication of how well an item functions statistically in relation to all items on a scale (Strickland, 1996). The corrected item-to-total correlation is the Pearson correlation coefficient between the item scores on individual items and the sum of the scores for the remaining items. Results ranged from  $r=.024$  to .681. Tables 8 presents these results by dimension.

#### Internal Consistency Reliability

Cronbach's alpha was calculated to estimate reliability based on the average correlation among items within the dimensions (Nunnally & Bernstein, 1994). The alpha coefficient is the preferred index of internal consistency reliability and measures the extent to which performance on any one item within a scale is a good indicator of performance on any other scale item. How items correlate with each other, the total scale, and coefficient alpha are all interrelated (Knapp & Brown, 1995). Cronbach's alpha for the dimensions were: work life/home life .45, work design .49, work context .88, and work world .60 (see Table 8).

### Final Questionnaire Format

Based on the pilot test findings, eight items were reworded so that Not Applicable was not necessary as a possible response on the final questionnaire. The rewording did not change the intent of the variable the item was to assess, it merely eliminated the need for Not Applicable as a response or further clarified the meaning of the item while leaving the diagnostic nature intact. When a Not Applicable response column is included on questionnaires it is not always clear whether the subject chose to not answer an item that actually did apply to them or whether the subject did not give much thought to the item (Aday, 1989). The directions were modified accordingly. Eliminating the Not Applicable response column enabled the total scale score to be calculated consistently. The possible total scale score for the final, 42-item questionnaire ranged from 42 to 252.

The rating scale was also modified, with “1=disagree” changed to “1=strongly disagree” and “6=agree” changed to “6=strongly agree.” Although the range of item scores and item variance were adequate, clarifying the response range for future use may make the instrument easier for respondents to complete.

Based on the item summary data for item 37 (“bring work home with me”), this item was deleted from the questionnaire. The pilot study subjects were clearly confused by the intent of the item as evidenced by the numerous, unexpected Not Applicable responses. Staff nurses do not typically bring paperwork home with them, but rather staff nurses might “bring work home”

in the sense of thinking about work concerns while at home. It appears that most of the subjects interpreted this item to mean bringing paperwork home. Due to the lack of clarity in this item, item 37 was deleted. With item 37 removed, Cronbach's alpha for the Work life/home life dimension was .44.

Eight other items (see Table 8) evidenced low corrected item-to-total correlations (items 2, 11, 16, 20, 25, 27, 29, and 38) which did not meet Nunnally and Bernstein's .30 criterion. But, all the content experts rated these items content valid (CVI=1.00). Since the sample size in the pilot study was small (n=58) and small samples tend to produce less accurate estimates than larger sample (Polit & Hungler, 1999) these items were retained for further testing which a larger sample. Also, indicated earlier, Strickland maintains that item summary results should be interpreted with caution since the pilot sample size was small (O.L. Strickland, e-mail communication, April 12, 1999). Likewise, there were a large number of Not Applicable responses to items 20, 27, and 36, so these items were also retained for further testing. The final questionnaire contained 42 items (Appendix B).

### Construct Validity

#### Factor Analysis

To analyze the dimensionality of the responses to this instrument, confirmatory factor analysis was used to test the hypothesis that a specified subset of variables legitimately defines quality of nursing work life. When items are correlated, factors emerge that convey various aspects or themes of the construct being studied. "Factor analysis offers an empirical method of

elucidating the underlying dimensionality of a large number of measures" (Polit & Hungler, 1999, p. 520). A variety of factor analysis options are available. Confirmatory extraction was used here because it is considered a "true" form of factor analysis and does not require rotation of factor results because the maximum likelihood estimates generated through the analysis are final estimates.

Exploratory factor analysis (EFA), another option which is available, differs from confirmatory factor analysis in that the underlying dimensionality of a construct is explored by factor extraction. When no a priori assumption about factor structure exists, EFA can be used to examine the underlying dimensions of a construct by assisting the researcher in deciding how many factors to retain. Once exploratory factor extraction is completed, a number of factor rotation methods are available to enhance the researcher's ability to interpret the findings. Since the data collected in this study provided an inadequate fit with the hypothesized model, EFA was also conducted. A complete description of EFA follows in a later section.

#### Confirmatory Factor Analysis

The purpose of confirmatory extraction is to determine the fit of the observed variables with the assumptions of the researcher. Several competing models were entered into the program, as more than one model can adequately represent the given data. In this study, three models were tested. First was the hypothesized measurement model: work life/home life, work context, work design, and work world dimensions that underlie QNWL. One rival, three-

dimension model was also tested. This model combines work context and work design variables as suggested by Baumann (1995). A second rival model, the uni-dimensional model was also tested. The uni-dimensional model allows the items to load only on one factor, rather than predetermining where the items will load as in the hypothesized measurement model. In this way, the researcher is able to have additional evidence from rival models that support the hypothesized model as being the best fit for the data. Testing multiple plausible models may yield stronger evidence regarding validity.

Each item was free to load on one specified factor, with zero loading on the other factors; error terms for the items were uncorrelated; and factors were not correlated. Further, the maximum likelihood estimation procedure assumes that the common factors and unique scores are both normally distributed (Gorsuch, 1983). Distribution of variables in the factor analysis was examined for normality (skewness and kurtosis). Assumptions of this model were: multivariate normal distribution, linear relationships among items, absence of multicollinearity, and overidentified model. Normality and linearity were checked by graphing and distribution techniques. Skewness and kurtosis results are reported in the Results chapter. In this study, variables did not depart widely from linearity and normality, therefore it was not necessary to transform any variables. If variables depart from normality there are various options for transformation (square root, log, or inverse). If problems of multi-collinearity exist, one or both of the colinear variables may be dropped or combined. Since no variables correlated .90 or greater, no variables were

dropped or combined. The model will be checked for overidentification.

After determining the number of factors, which variables belong to which factor, and which model best explains the fit of the data, the following fit statistics were computed: Bentler Comparative Fit Index, chi-square to degrees of freedom ratio, the Goodness of Fit Index, the Adjusted Goodness of Fit Index, Root Mean Square Residual, and the Root Mean Square Error of Approximation. These various fit statistics were interpreted together. Likewise, results of chi-square tests were interpreted with caution based on the normality of the data and sample size. The parsimony ratio and the parsimonious normed fit index were also assessed. Cronbach's alpha for each factor is reported. If the uni-dimensional model best fits the data, then Cronbach's alpha will be reported for the total scale. Finally, estimated parameters (structure coefficients, error variance, and factor correlations) were tested for statistical significance using Z- tests provided by SAS System Version 8 for Windows, proc calis procedure.

#### Exploratory Factor Analysis

In actual practice it would be considered inappropriate to use the same data set for both exploratory and confirmatory factor analyses (Kieffer, 1998). In this study, CFA was completed first and subsequently revealed that the hypothesized four factor model did not fit the data. It was decided to compute an EFA to explore the underlying dimensionality of the QNWL construct. Exploratory factor analysis "isolates factor structures without consideration of the theoretical expectations of the researcher" (Thompson & Daniel, 1996, p.

198). To isolate factor structures, exploratory factor analysis (EFA) proceeds in two stages: initial factor extraction and rotation of factors.

Prior to the extraction phase a number of criteria were established by which to interpret the findings. The criteria for structure and pattern coefficients were as follows: coefficients greater than .60 are often considered large and coefficients of .30 are considered moderate (Kieffer, 1998; Nunnally & Bernstein, 1994).

In this study, factor extraction was conducted using parallel analyses, as this method is the only method that provides a non-arbitrary rule for deciding the number of factors to retain (E. Smith, e-mail communication, May 9, 2000).

The second stage, rotation of factors can be accomplished only if more than one factor is retained. Orthogonal varimax rotation maintains the independence of the factors showing that the factors are uncorrelated with one another offering greater theoretical clarity. Oblique rotation—based on the assumption that the factors may be correlated with one another—can also be conducted. Rotation does not change “either the communalities of the variables or the total trace reproduced by the factors,” but rather rotation does redistribute the variance across the factors (Thompson & Daniel, 1996, p. 201). Comparing the results of several rotation methods will enable the best solution to be used for final interpretation and reporting, even though “studies have revealed that similar conclusions are often reached by both rotational procedures” (Polit & Hungler, 1999, p. 523). After rotation, the researcher can also determine if it is possible to name the factors.

### Marker Variables

Factor analysis should contain variables with known properties, often referred to as marker variables (Gorsuch, 1983; Nunnally & Bernstein, 1994). Marker variables have been previously studied, can be identified from related analysis found in the literature, and can be used to suggest specific empirical referents contained in the construct. Since the number of previous studies on QNWL are limited, the QWL literature also was examined for the purpose of identifying marker variables. Based on this review and the empirical referents contained in Table 3 and 4, the following marker variables are identified: item 2 (job satisfaction), item 10 (child care), item 14 (career advancement), and item 41 (work impacts the lives of others). Nunnally and Bernstein (1994) state that marker variables “should correlate .50 on a factor” (p. 536).

### Convergent Validity

The basic premise of convergent validity is that different measures of the same construct should correlate highly with each other. Correlating a new measure with an existing valid measure is one way to demonstrate convergent validity (Nunnally & Bernstein, 1994). A comprehensive review of the literature did not produce a questionnaire to actually validate the construct validity of the QNWL questionnaire in its entirety, but there was one questionnaire with which to correlate the work design and work context dimensions of the QNWL questionnaire.

Job satisfaction is an important part of QWL (Lawler, 1975; Seashore, 1975; Taylor, 1977; Walton, 1975) and therefore it is hypothesized that a

measure of job satisfaction will show a high positive correlation with a measure of QNWL. Stamps and Piedmonte's 43-item Index of Work Satisfaction (IWS) (1986), designed to measure nurses' need satisfaction and importance, contains two sub-scales that has evidenced acceptable reliability in previous research (interaction [ $\alpha = .82$ ] and task requirements [ $\alpha = .70$ ]), is hypothesized to strongly correlate with the work design and work context dimensions. Accordingly, these items were included on the instrument (Appendix B). Using these hypothesized relationships to investigate the construct validity of the QNWL measure may not be conclusive, but it may be informative. This analysis was not conducted because the data did not fit the hypothesized, four-factor model.

### Sampling

The key to successful factor analysis is careful selection of variables so that the variables correlate highly with one another (Nunnally & Bernstein, 1994). A conceptual framework was used to facilitate exploration of all possible variables. A second key to successful factor analysis is selection of subjects; a large, representative sample is recommended when employing this technique. Gorsuch maintains that "samples sizes of 200 or more would be large enough to test for normality of the data" (p. 129).

A representative sample from Illinois was selected, which is reasonable since the population of registered nurses in Illinois closely parallels registered nurses in the nation in terms of educational preparation, income, ethnic group, and urban/rural distribution (Hughes & Marcantonio, 1991). A representative

sample enhances the generalizability of the findings to other registered nurses. Hence, the population for this study were the 122,000 registered nurses licensed and residing in the state of Illinois (94% live and work in Illinois, while only 1.5% both live and work outside Illinois) (Marcantonio, Young, & Howard, 1997). A simple random sample of registered nurses was selected from the most up-to-date, alphabetical list from the Illinois Department of Professional Regulation (IDPR).

A random sample drawn from an existing list may include ineligible respondents. Desired respondents for this study were staff nurses, charge nurses, or team leaders currently working in hospital settings. To obtain enough eligible subjects for this study and to have adequate data for factor analysis, a sample of 420 subjects was desired. "A ratio of at least 10 subjects for each variable is desirable to generalize from the sample to a wider population" (Munro, 2001, p. 317). However, Knapp and Brown (1995) note that ratios as low as three subjects per variable are sometimes acceptable. A probability sample of 1,500 registered nurses from the population was selected at random from IDPR's database. If 30% of the 1,500 subjects responded to the survey and are eligible to participate (n=450), then enough data would be collected for factor analysis. Table 9 summarizes population data related to employment status, setting, and position.

#### Missing Data

In research studies, there are many reasons why members of a sample decide whether or not to participate. Because non-response is not a random

process, it is important to know whether those who did not respond differ greatly from those who responded. Available demographic, labor participation, practice setting, and educational preparation information about the population can be used to compare those who did and did not participate in the study. Mail surveys present difficulties that may prevent these comparisons from being done. Most important is that the researcher is aware of this limitation. Perhaps more salient is the relationship of non-response bias to missing data.

If within the sample of participating subjects extensive data are missing for certain variables, the researcher needs to examine whether that data are missing at random or if there is a pattern to the missing data based on some other factor. Comparing the characteristics of subjects who have actual data on a variable with those subjects who have missing data on that variable may be illustrative and assist in explaining any bias that may exist in the data collected.

In order to handle missing data, listwise deletion was used in the factor analysis computations. Bentler and Chou's study (as cited in Smith & Johnson, 1998) recommend listwise deletion "to reduce the risk of obtaining non-positive definite covariance matrices for subsequent confirmatory factor analysis" (p. 166).

When calculating total scale scores, if a subject had 5% of the data missing on the 42-item questionnaire, then the subject was dropped from the analysis.

### Questionnaire Distribution

A cover letter and questionnaire including a pre-paid return envelope was mailed via the U.S. Postal Service to each subject's home (see Appendices C and B). One week later a postcard follow-up was sent to all recipients of the first mailing (Appendix D). The postcards were preprinted, but had a personalized mailing label and were signed individually. The text was written as a thank you for those who had already returned their questionnaires, and a reminder to those who had not. A second follow-up questionnaire with letter was mailed to non-respondents three weeks from the original mailing date (see Appendix E). Dillman (1978) recommends personalization of cover letters, original mailing labels (not photocopies of labels), original signatures, first-class postage (automatically forwarded for one year after change of address), business reply postage, and the availability of research findings to the subjects as means to enhance response rates. Post office returns were forwarded when a forwarding address was provided by the U.S. Postal Service. New subjects were not substituted for those unavailable by mail. Conducting mail surveys using the above method has realized 50-78% return rates (Dillman, 1978).

### Ethical Considerations

Approval was granted from the University of Illinois Institutional Review Board to conduct this study (see Appendix F). An informed consent/introductory letter was provided to each registered nurse in the sample (see Appendix C). Returning the survey implied consent to participate in the study.

## CHAPTER FOUR

### Results

#### Respondent Demographic Data

The original sample included 1,500 registered nurses licensed in Illinois. The response rate was 48.2% (n=723); however, only 47% (n=341) of the 723 respondents were charge nurses, team leaders, and staff nurses in hospital settings eligible to participate in the study (Table 10). The other 382 licensed registered nurses who returned surveys did not work in hospitals, held management positions, were faculty in nursing programs, or were advanced practice nurses (Table 11). Chi-square analyses were conducted to compare the pilot test respondents with respondents eligible to participate in the full study. Respondents for the full study differed significantly (95% confidence) from the pilot test respondents in terms of gender and educational preparation. The full study had male respondents while the pilot study did not ( $X^2 (1) = 3.42, p < .06, n = 396$ ) and the full study had respondents with graduate level nursing education preparation while the pilot study did not ( $X^2 (3) = 7.94, p < .04, n = 395$ ). It should be noted that the pilot test sample was small (n=58) and that in some of the chi-square analyses 25% of the cells had expected counts less than five, so these results should be interpreted cautiously.

#### Confirmatory Factor Analysis

Factor analysis is an analytic technique in which the primary concern is to reduce a large set of variables into a smaller, more manageable set based on the consistency of the data. "This is often achieved by including the maximum

amount of information from the original variables in as few derived variables, or factors, as possible to keep the solution understandable” (Gorsuch, 1983, p. 2).

In developing this questionnaire, an untested conceptual framework was used as a frame of reference to organize items generated from the literature. This framework was used to explore the broad, multidimensional construct quality of nursing work life. Confirmatory factor analysis (CFA) was used to test the conceptual framework based on a priori theoretical considerations.

#### Requirements and Assumptions for Confirmatory Factor Analysis

With CFA one begins with a model that predicts the existence of a specific number of factors (in this case the four factors of work life/home life, work design, work context and work world) and predicts which items load on each factor. For the model at hand, there are 42 endogenous or manifest variables (item 1-item 42), there are 46 exogenous or latent variables (exogenous variables are the 42 items' error terms and the four factors), and the four factors are not correlated. With confirmatory factor analysis, one is able to first predict the model, evaluate the fit of this model through goodness of fit indices, and explore possible modifications to the model. Following is an analysis of the results of CFA models using the covariance matrix as input, maximum likelihood as the estimation method, and the variance was fixed to one to establish the metric. Normal distribution of each variable and the common factor is an assumption in order to use the maximum likelihood estimation procedure (Gorsuch, 1983).

If this CFA model described above performs well, meaning that it accurately accounts for the observed relationships in the data set, then it should provide a good fit to the data. In order to know if this is in fact true, the researcher reviewed the overall goodness of fit indices and followed by an examination of indices that provide more detailed assessment of fit. For this study, the CFA specified the following: responses could be explained by a four-factor model; each item would be free to load on one specific factor, with zero loading on the other factors; the error terms for the items would be uncorrelated, and the factors were not correlated. Model fit data was based on: (a) chi-square to degrees of freedom ratio; (b) the comparative fit index (CFI); (c) the goodness of fit index (GFI); (d) the adjusted goodness of fit index (AGFI); (e) root mean square residual (RMSR); (f) root mean square error of approximation (RMSEA); (g) parsimonious GFI ratio; (h) parsimonious normed fit index (NFI); and (i) z-tests for individual parameter estimates. The fit statistics results must be interpreted together in order to accurately assess the model-to-data fit (Thompson & Daniel, 1996). Two rival models were explored in this study as well. The first is a three-dimensional model that combines the work context and work design scales, the second is the uni-dimensional model.

Symmetry is an important feature of a distribution. "For a perfectly symmetrical distribution the skewness and kurtosis coefficients will be 0" and in general "the values will fall between -1.00 and +1.00" (Munro, 2001, p. 42). The distributions for the items ranged from -1.83 to 0.53 ( $M = 0.49$ ) indicating slightly positively skewed distributions, while values for kurtosis ranged from -

1.16 to 3.88 ( $M = 0.73$ ) indicating slightly leptokurtic distributions. Given the observed values of kurtosis, one may expect departures from multivariate normality. "In confirmatory factor analysis, the greater the departure from multivariate normality the more the chi-square values will be inflated, thereby yielding distorted test statistics and fit indices" (Smith & Johnson, 1998, p. 169). Graphing techniques did not reveal that the variables' distributions departed widely from normality, that is, the variables were normal. Raw data were used and the data were not transformed.

A feature of causal models is that they can be overidentified, just identified, or underidentified. An advantage of an overidentified model is that unlike just-identified or underidentified models, the model as a whole can be statistically evaluated for its fit to the data (Munro, 2001). In this study, the number of variables and co-variances is larger than the number of parameters to be estimated. This study estimated 84 parameters, the 42 free variables and the 42 error terms. In the models factors were not correlated (no co-variances were estimated). Repeated analysis with different start values verified that the same parameter estimates were obtained each time. No identification problem was noted in the computer log.

The item means, standard deviations, and correlation matrix are provided in Table 12. The correlation matrix was examined to be sure that there were no high correlations between variables that would indicate multicollinearity. The correlation matrix for the 42-item QNWL questionnaire contains correlations from  $-.002$  to  $.736$ . Although some psychometricians

consider items redundant when correlations are .70 or above, Strickland (1996) maintains that “items can not be assumed to be truly redundant unless their correlation with another item is .90 or above” (p. 4).

The sample size necessary for factor analysis is determined by the number of items contained in the questionnaire, with a minimum of five cases per item required, and 10 cases per item preferred (Gorsuch, 1983). Bentler and Chou (as cited in Smith & Johnson, 1998) recommend listwise deletion “to reduce the risk of obtaining non-positive definite covariance matrices for subsequent confirmatory factor analysis” (p. 166). After listwise deletion, approximately six cases per item were available for the factor analysis ( $n = 265$ ).

#### Four-Factor Model Results

The chi-square assesses the difference between the observed variance/covariance matrix and the variance/covariance matrix reproduced by the measurement model. The researcher is testing to confirm the null hypothesis, i.e. that there is no difference between the model and the data. If this hypothesis is correct, one should see a small chi-square value with a corresponding large p value, that is the chi-square should be statistically nonsignificant (Munro, 2001). Table 13 shows that the probability that the model fits the data well is  $p < 0.0001$ . A problem with some goodness of fit indices is that they may be sensitive to sample size and to violations of assumptions of multivariate normality (Thompson & Daniel, 1996). Therefore, the ratio of the model’s chi-square to degrees of freedom was also calculated ( $X^2/df = 3.93$ ). While there is no consensus on what value indicates a good fit, a

more conservative ratio of less than 2:1 is acceptable according to Tabachnick and Fidell (1996).

The comparative fit index (CFI) assesses the model fit by evaluating the comparative fit of a given model with that of a more restricted null model. It ranges from 0 to 1.00, with values greater than .90 indicating acceptable fit (Smith & Johnson, 1998). CFI is considered an index that is less likely to produce biased estimates in small samples. In Table 13 one can see that CFI=0.48.

The goodness of fit (GFI) and the adjusted goodness of fit indices (AGFI) attempt to assess the degree to which the reproduced covariance matrix based on the specified model has accounted for the original sample covariance matrix (Kieffer, 1998). Generally, GFI and AGFI range from 0 to 1.00, with values greater than .90 indicating acceptable fit (Munro, 1997). In this model GFI =.63; AGFI =.60.

Parsimony is defined as the simplicity of the explanation. Parsimony ratios take the model parsimony into consideration by imposing penalties for models that are more complex as more complex models tend to fit the data better. Table 13 reports parsimonious GFI =.60; parsimonious NFI =.39. Mulaik (1998) maintains that the parsimony-adjusted index should be “at least in the mid-80s to begin to give a high degree of confidence in the model, but it is not unusual to expect low parsimony-adjusted goodness-of-fit indices in early research efforts” (Mulaik, 1998, p.4).

It is generally accepted that a good fit on root mean square residual (RMSR) and root mean square error of approximation (RMSEA) statistics is indicated if the value attained by the model is less than .05 (a better fit is indicated as the statistic approaches 0) (Kieffer, 1998). The four-factor model revealed RMSR = .32; RMSEA = .10.

The original hypothesized four-factor model did not provide a satisfactory fit to the data. It appears that another model would be a better fit.

#### Four-Factor Model Parameter Estimates

The four-factor model was intended to indicate the four factors outlined in the conceptual framework described by O'Brien-Pallas and Baumann (1992). The expectation was that each variable would have large pattern coefficients on only the one factor with which the variable is expected to be associated. For the purpose of this analysis, maximum likelihood estimates for pattern coefficients were estimated and are presented for the four-factor model in Table 14.

In general, "moderate but salient coefficients are those between .30 to .60" (Nunnally & Bernstein, 1994, p. 533). Pattern coefficients for most variables are satisfactory, although four variables in Factor 1 were problematic. Variable 5 (balance), 12 (energy left after work), 20 (rotating schedules), and 25 (family-medical leave) evidenced pattern coefficients ranging from .04 to .10. The z-tests for these four pattern coefficients ranged from .68 to 1.49; if the z-test is significant (z values greater than 2.0 for  $p \leq .05$ ) this supports the variable as a measure of the dimension.

Two variables in Factor 3 and one variable in Factor 4 were also problematic. Variable 29 (private break area) and 30 (BSN degree completion programs) in Factor 3 evidenced pattern coefficients from .00 to .07; z-tests for these two variables ranged from .02 to 1.07. Variable 4 (society has the correct image of nurses) in Factor 4 had a pattern coefficient of .11 and a z-test of 1.37.

Table 14 also displays results for indicator reliability and error variance. Indicator reliability indicates the percent of variance in each indicator that is accounted for by the common factor to which it is assigned (Long, 1983). Individual items from questionnaires may serve as indicator variables, although this is less desirable as individual items tend to display lower levels of reliability, especially when the scale is new (Long, 1983). Indicator reliability ranges from 0 to 1.00, with .30 to .50 indicating moderate fit, while 1.00 indicates a perfect fit of that indicator in the factor. Indicator reliability in this study ranged from .00 to .69. Also included in Table 14 are error variance estimates. These estimates describe the percentage of variance due to error, which are easier to interpret since these estimates range from 0 to 1.00.

#### Four Factor Model Internal Consistency Reliability

The alpha coefficient is the preferred index of internal consistency reliability. It measures the extent to which performance on any one item within a scale is a good indicator of performance of any other item on the scale. Internal consistency reliability estimates for the four QNWL subscales were .37 to .87. Details regarding internal consistency reliability for every variable

contained in each sub-scale are outlined in Table 15. Generally, when alpha yields acceptable results within each factor it helps establish internal consistency reliability and beginning supportive evidence of construct validity (Munro, 2001).

#### Four Factor Model Marker Variables

As described earlier, marker variables that contain known properties were included in the analysis (Gorsuch, 1983; Nunnally & Bernstein, 1994). In this analysis, the marker variables and their corresponding structure coefficients were: item 2 job satisfaction (.64), item 10 child care (.66), item 14 career advancement (.55), and item 41 (work impacts the lives of others (.30). Nunnally and Bernstein (1994) state that marker variables “should correlate .50 on a factor” (p. 536). While this marker variable evidence may not be conclusive, it indicates three marker variables are empirical referents of QNWL. Gorsuch (1983) maintains that the identification of marker variables and subsequent results facilitates the accumulation of findings about a particular construct under investigation.

#### Rival Model Results

The first rival model assessed was the three-factor model. The three-factor model did not provide a satisfactory fit to the data ( $X^2(819) = 3,194.98$ ;  $p < .0001$ ;  $X^2/df = 3.90$ ; CFI = .49; GFI = .64; AGFI = .60). The second rival model, the uni-dimensional model, did not provide a satisfactory fit to the data either ( $X^2(819) = 3,135.13$ ;  $p < .0001$ ;  $X^2/df = 3.84$ ; CFI = .50; GFI = .64; AGFI = .60). These and other results are reported in Table 13.

### Data-Driven Model Modifications for the Four Factor Model

After examining the fit statistics, it is important to examine the modification indices to determine if a better model-to-data fit would be generated if some of the fixed parameters were freed. In this study, model modifications focused on four items in factor one. Items in factor one were problematic regardless of the number of factors in the model. "Authors are encouraged to use sample statistics to change models and then test improved fit with the same sample, only with considerable reticence and caution" (Thompson & Daniel, 1996, p. 205). As indicated in Table 14 for the four-factor model, structure coefficients were generally acceptable in factors two, three, and four. However, there were problems with structure coefficients for four of the seven items in factor one (item 5 =.04, item 12 =.05, item 20 =.08, and item 25 =.10). Inter-item correlations were also extremely low (-.068 to .385). Using the PROC CALIS command in SAS for Windows (1999), data-driven modification indices were suggested by the Lagrange multiplier test.

The general form for modifying a model is to make the single modification that will result in the greatest improvement in the overall fit of the model, analyze the fit of the revised model, review modification indices, and repeat the steps as necessary. The Lagrange multiplier (LM) a post hoc analysis, estimates the reduction in model chi-square which would result from freeing a fixed parameter and allowing it to be estimated. Ten modifications that improved chi-square the most were suggested by the LM test. One of the modifications seemed plausible as the content experts too showed considerable disagreement

as to the proper dimension for the item, while the content experts did not support other suggested data-driven modifications. Only those modifications related to items in factor one are discussed below (items 5, 12, 20, and 25).

The LM indicated that establishing an association between item 5 (able to balance work with family needs) and factor two (work design) or item 5 and factor three (work context) would improve the model. As indicated in Table 14, the structure coefficient for item 5 was .04 on factor one. The content experts rated item 5 content valid (CVI = .85) and they agreed that item 5 (able to balance work with family needs) belonged in factor one (work life/home life), but the data indicated another model would be a better fit. The fit of these two different modified models was: (1) item 5 to factor 2  $X^2(819)=3,191.46$ ,  $p<.0001$  or (2) item 5 to factor 3,  $X^2(819)=3,190.18$ ,  $p<.0001$ . These data-driven modifications slightly improved chi-square, but chi-square remained statistically significant, and conceptually are not in agreement with the content experts.

Though the content experts were in complete agreement as to the proper factor (1) for item 12 (energy left after work), the LM indicated that establishing a relationship between item 12 (energy left after work) and factor 2 (work design) would improve the model or item 12 (energy left after work) and factor 3 (work context. As indicated in Table 14, the structure coefficient for item 12 was .05. During the content validity stage of questionnaire development, the content experts rated item 12 content valid (CVI= 1.00) and they all agreed that item 12 (energy left after work) belonged in factor one (work life/home life). The

fit of these two different data modifications were: (1) item 12 to factor 2,  $X^2(819)=3,154.37$ ,  $p<.0001$  or (2) item 12 to factor 3,  $X^2(819) =3,180.77$ ,  $p<.0001$ . So while these data-driven modification did improve chi-square, the chi-square remained statistically significant, and conceptually are not in agreement with the content experts.

Two other data-driven model modifications suggested by the LM seemed more plausible as the content experts showed considerable disagreement as to the placement of item 25 (family medical leave) into the proper dimension. As indicated in Table 14, the structure coefficient for item 25 was .10 on factor one. The Lagrange multiplier indicated that chi-square would improve if a relationship was established between item 25 and factor three (work context) or item 25 and factor four (work world). In the case of item 25, the content experts rated this item content valid (CVI = 1.00), but they showed no agreement as to the proper dimension for this item. The results were: (1) item 25 to factor 3  $X^2(819) = 3,177.27$ ;  $p<.0001$  or (2) item 25 to factor 4  $X^2(819) = 3,191.10$ ,  $p<.0001$ . These data-driven modifications did improve chi-square, but chi-square remained statistically significant, but these modifications seem more plausible because the content experts showed no agreement as to the proper dimension for item 25.

Interestingly, item 20 (rotating schedules) had a structure coefficient of .08 to factor one, but the data did not indicate a model modification for this item. Based on these data-driven model modifications, testing a revised model was needed.

### Conceptual Reasons to Modify the Four Factor Model

Model modifications can be based on data alone, but any model modification should make conceptual sense as well. An examination of some possible conceptual reasons for these items (5, 12, and 25) not fitting the hypothesized model are described below which substantiate the data-driven model modifications.

First, although the experts agreed that item 5 (able to balance work with family needs) was relevant to the domain and agreed this item belonged in the work life/home life dimension, data-driven model modifications indicated that establishing a relationship between this item and factor 3 would improve chi-square. Factor 3 addresses work context (environment) issues. One could argue that an employer could offer a better selection of discretionary employee benefits, better enabling nurses to balance work and family needs. Sixty-five percent (n=221) of the nurses in this sample worked full time and had children either under the age of 5 (n = 236) or children between 6 and 18 years of age living at home (n = 184). Given that 66% (n=226) of the respondents agreed (ratings of 6, 5 or 4) that they were unable to balance work with family needs, it appears that this item is relevant to registered nurses working in hospitals. So there may be practical and conceptual reasons to move this item to the work context dimension.

Second, item 12 (have energy left after work) had a structure coefficient of .05 for factor 1. Even though the experts agreed this item was relevant to the domain (CVI = 1.00) and all the experts agreed this item was a part of the work

life/home life dimension, one could still argue that it may belong in factor 2 which addresses skill mix and staffing ratio issues. Establishing a relationship between item 12 (energy left after work) and factor 2 (work design) was suggested by the data-driven model modifications described above. Obviously, one will not have energy left after work with non-optimal staffing levels and a skill mix with too many UAPs which results in an increased workload on a unit for any particular shift. In this study, 67% (n =230) of the respondents agreed (ratings of 6, 5, and 4) they did not have energy left after work. A reasonable argument could be made for placing this item in factor 2, since factor 2 addresses skill mix, workload, and staffing issues.

Item 25 (my organization's policy for family-leave is adequate) performed poorly in many areas (see Table 14). From the data-driven model modifications the greatest improvement in chi-square was realized when a relationship between this item and factor 4, work world, was established. The Family Medical Leave Act (FMLA) is federal legislation administered by the Department of Labor. It mandates that all covered employers be prepared to provide up to 12 weeks of unpaid or paid leave per year in the following instances: to care for an ill child, spouse or parent; to address one's own serious illness; and for occasions related to the adoption or birth of a child (Department of Labor, 2000). A reasonable argument can be made then that this item fits into the work world dimension, which defines the broad societal influences on work. Based on both the data-driven model modifications and this conceptual discussion, it is reasonable to move this item to the work world dimension.

Item 20 (rotating schedules negatively affect my life) received a CVI rating of 1.0 from the content validity experts, but the experts did not agree on its proper dimension. Interestingly, the data did not indicate a model modification for this item, even though its structure coefficient was .08 on factor 1. Perhaps the reason that this item is performing poorly is its negative wording.

Negatively worded, reverse scored items can be problematic and attention to structure coefficients is warranted during factor analysis (Schriesheim et al., 1999). As it is not possible to change the wording of this item at this time, this item may continue to perform poorly in the revised model suggested below.

### Revised Model Results

Based on the above discussion, the original model was revised in the following manner so that the listed items were allowed to load on a new factor: move item 5 (balance) to factor 3, work context; move item 12 (energy left after work) to factor 2, work design; move item 25 (family-medical leave) to factor 4, work world; but item 20 remains in factor 1. The results for this revised model are  $X^2(819) = 3,050.22$ ,  $p < .0001$ ;  $X^2/df = 3.72$ ; CFI = .52; GFI = .67; AGFI = .63. Other results, such as the parsimony ratios for this revised four factor model are contained in Table 16.

Pattern coefficients for items 5, 12, and 25 improved (.35, .55, and .78 respectively), but pattern coefficients for items 20, 29, and 30 were .08, .06, and .00 respectively. All z-tests were significant, except for items 20, 29, and 30 which were not significant at  $p \leq .05$ . Corrected item-to-total correlations for items 5, 12, and 25 improved to .34, .41, and .39 respectively, but items 4, 11,

16, 20, 29, 30, 37, 39, and 41 evidenced corrected item-to-total correlations less than .30. However, z-tests for items 4, 11, 16, 37, 39, and 41 were significant at  $p < .05$  so these items appear to be empirical referents of the construct. Detailed parameter estimate results are contained in Table 17 and item summary statistics and internal reliability results for the revised model are included in Table 18. So, while the chi-square and fit statistics did improve somewhat, it is not considered satisfactory to explain the co-variation. Therefore, an exploratory factor analysis (EFA) may provide additional insight into the underlying dimensionality of the construct.

#### Exploratory Factor Analysis Results

Using the same data set for both exploratory and confirmatory factor analyses is not recommended in actual practice (Keiffer, 1998). But in this study, CFA was completed first and subsequently revealed that the hypothesized four factor and competing models did not fit the data. It was decided to compute an EFA to explore the underlying dimensionality of the construct. Exploratory factor analysis “isolates factor structures without consideration of the theoretical expectations of the researcher” (Thompson & Daniel, 1996, p. 198). Principal components analysis was used to explore the dimensionality of the data. The EFA proceeded in two stages: initial factor extraction and rotation of factors. EFA was conducted on 265 complete cases using responses to 42 items. Table 12 displays item means, standard deviations, and the correlation matrix.

Parallel analysis was used to determine the number of factors to extract because this method is the only factor extraction method that provides a non-arbitrary rule for deciding the number of factors to retain (E. Smith, e-mail communication, May 9, 2000). In parallel analysis, a random raw data matrix is generated which has the same dimensions as the actual raw data matrix. Both data matrices were factor analyzed using principle components to obtain two sets of eigenvalues. These pairs of eigenvalues are compared across the real and the random data (Thompson & Daniel, 1996). "For each eigenvalue from the actual data matrix that exceeds the corresponding eigenvalue from the random data matrix, a factor is retained" (Smith & Johnson, 1998, p. 168). Parallel analysis indicated 2 factors should be retained. See Table 19.

### Two Factor Results

The two rotated factor pattern matrices evidenced similar results. In the oblique factor pattern matrix, pattern coefficients for 31 items ranged from .377-.677 on Factor 1 and ten items had pattern coefficients between .303 and .630 on Factor 2. Item 11 had pattern coefficients of .306 and .532 on Factor 1 and Factor 2, respectively. Two items (items 37 and 41) did not contribute to either factor. Since in an oblique rotation the factors are allowed to correlate, the inter-factor correlations were also examined. The correlation between the two factors was .032. This suggests the two factors are not correlated and provides evidence that the factors can not be combined into one factor. Table 20 describes these results.

In the orthogonal factor structure matrix, structure coefficients for 30 items ranged from .355 to .680 on Factor 1 and ten items had structure coefficients of .304-.629 on Factor 2. In this rotation, item 11 evidenced a structure coefficient of .533 on Factor 2 and a structure coefficient of .285 on Factor 1. Two items (items 37 and 41) did not contribute to either factor. Table 21 describes these results.

Once the factors have been rotated and interpreted, names are given to the factors. Upon careful examination of the rotations, there is no meaningful way to name these two factors. Items from all four of the hypothesized dimensions are contained in Factor 1 and items from three of the four dimensions of the conceptual framework are contained in Factor 2. An examination of the wording for the items was also considered as a possible reason for these ambiguous results, but again, item wording does not seem to be a cause. At the pilot test stage, the only item with unclear wording was item 37, but that item was not included on the final questionnaire. A review of the demographics describing these respondents was also examined to provide assistance in naming the two factors. Again, the respondents in this study are typical of the population of nurses in this country (see Table 10), so no unusual nuance in this group of respondents could be found which might explain the conceptual ambiguity of the factors.

In addition, the underlying theory, STS theory, used to define empirical referents and as a guide in item development was also examined to provide clues that might aid in naming these two factors. But unfortunately, items in

Factor 1 and the items in Factor 2 do not fall neatly into social subsystem or technical subsystems, the two components of STS theory. Likewise, the original framework used to explain the multitude of factors influencing nursing work life (see Figure 1), was analyzed for possible clues to name these two factors. Again, the items in the two factors do not represent internal and external factors as described in Figure 1. Even, after examining the original qualitative work of Attridge and Callahan (1990) and Villeneuve et al. (1995), no clues were found to assist in naming these two factors. Finally, an expert in quality of nursing work life was consulted to provide assistance in naming these two factors, but she too was unable to explain the ambiguous findings (G. Donner, personal communication, January 5, 2001). EFA was able to detect two underlying dimensions of the construct, but these two dimensions are not amenable to being named. Rasch measurement may be better for determining dimensionality of the construct. Rasch measurement is described in the next chapter.

### Summated Rating Scale Results

The purpose of having a composite scale score is to discriminate quantitatively (Polit & Hungler, 1999) about the quality of work life for staff nurses in hospital settings. The total possible scale score for the 42-item questionnaire ranged from 42 to 252. A low total scale score indicates a low quality of nursing work life, while a high total scale score indicates a high quality of nursing work life. For each subscale the same is true, a high score indicating a more favorable environment. Total possible sub-scale scores by

dimension are as follows: work life/home life sub-scale 7-42; work design 10-60; work context 20-120; and work world 5-30. As described earlier, by obtaining a total scale scores for a group of staff nurses in a particular setting, the researcher is able to determine or “diagnose” the current state of nursing work life in that particular setting. But in order to interpret the meaning of scores obtained here (see Table 22), it is helpful to know something about the distribution of scores in various populations. The meaning of the obtained scores can only be interpreted in relation to some frame of reference. Because this is an initial study, a frame of reference has yet to be established; therefore it is difficult to interpret these results (Spector, 1992).

While a summated scale score may be of value, examining the responses on particular items may be more illustrative. In this study, four of the seven items in factor one (items 5, 12, 20 and 25); two items in factor three (items 29 and 30), and 2 items in factor four (items 4 and 24) did not provide empirical support for the conceptual framework in that their structure coefficients were less than .30 (although item 24’s structure coefficient (.26) had a z-test that was statistically significant) (see Table 14). Also, the experts agreed on the proper dimensions for items 4, 5, 12, and 29, but were less clear about the proper dimension for items 20, 24, 25, and 30. These items evidenced corrected item-to-total correlations ranging from .04 to .27. Removing any one of these items from its respective factor changed the alpha for that factor, although not much (Table 15).

A brief review of these eight items is provided in the following section. The results reported here and subsequent sections indicate the percentage of nurses that responded with ratings of agree to strongly agree (ratings of 4, 5, and 6) or the percentage of nurses that responded strongly disagree to disagree (ratings of 1, 2, and 3). Ninety-five percent of the nurses (n=323) agreed that a private break area designated for nurses was needed, 80% (n=270) agreed that on site nursing degree granting programs were important, 62% (n=207) agreed their family-medical leave adequate, and 57% (n=194) agreed their salaries were adequate. Conversely, 74% (n=248) did not think society had an accurate image of nurses, 67% (n=230) did not have energy left after work, 66% (n=226) felt rotating schedules negatively affected their lives, and 66% (n= 209) were unable to balance work with their family needs. Table 23 depicts a summary of the items which evidenced weak empirical support from the revised model.

Following is a brief summary of findings for select items. Workload, staffing, and quality of care issues are of concern. Sixty-seven percent (n=227) of respondents indicated their workload was too heavy, 59% (n=199) responded there were not enough registered nurses on their units, and only 47% (n=181) indicated they had enough time to do their job well. Even in light of these results, 78% (n=265) said they provided good quality patient care.

Many hospitals have changed their skill mix from skilled to unskilled workers in efforts to save money. Very often unskilled workers called unlicensed assistive personnel (UAP), are hired to carry out duties such as changing bed linens, distributing meal trays, transporting patients to other

departments, recording vital signs, and in some hospitals performing phlebotomy. Only 54% (n= 178) of the nurses in this study agreed they had sufficient amounts of assistance from UAPs and only 59% (n= 198) agreed they received quality assistance from UAPs.

In terms of relationships with unit management, 72% (n=242) agreed they communicated well with the nurse manager and 72%(n =240) received feedback from the nurse manager. Less positive was nurses' participation in decisions made by the nurse manager (50%, n=169) and how often they were recognized for their accomplishments by the nurse manager (62%, n= 206). Disturbing was that only 37% (n= 125) of the nurses in this sample felt respected by upper-management. Surprisingly, 70% (n=236) of this sample felt respected by physicians and 80% (n=299) said that they communicated well with physicians.

Finally, 78% (n=262) of the respondents thought it was important to have on-site child care, and 70% (n= 234) thought on-site child care for ill children was important. Only 56% (n= 187) of these respondents thought on-site day care for elderly parents was important. Also, the respondents agreed that friendships with co-workers, teamwork, feeling like one "belongs," and communication with other allied health professionals is important. Of concern however, was that only 65% (n =201) of the respondents felt the security department provided a secure environment or that they were safe from personal harm. This summary provides an overview of the items, although not every item is discussed.

## CHAPTER FIVE

### DISCUSSION AND RECOMMENDATIONS

#### Factor Analysis

##### Confirmatory Factor Analysis

As indicated in Chapter 4, a confirmatory factor analysis of the four-factor model did not provide empirical support for the work life/home life, work design, work context, and work world dimensions of the conceptual framework used in this study. The rival three-factor model was not supported either, even though Baumann (1999) believed that the work design and work context dimensions may in fact be one dimension. But more important, factor one again proved problematic. The uni-dimensional model was also not supported by the data. Both data-driven and conceptual model modifications were examined and a revised four-factor model was estimated.

As described in the previous section, pattern coefficients and corrected item-to-total correlations for the revised four-factor model improved for items 5, 12, and 25, and z-tests for items 4, 11, 16, 37, 39, and 41 were significant at  $p < .05$ . But even with these modifications, the data did not reveal an adequate fit. While some parameter estimates improved, chi-square and fit statistics did not improve dramatically. This may be in part due to the large number of items, the different number of items in each factor, the small number of items in factors 1 and 4, or might be related to the small sample size (Bentler & Chou, 1987; Gorsuch, 1983).

But items 20, 29, and 30 continue to be problematic. The pattern coefficients for these items were less than .30, their z-tests were not significant at  $p < .05$ , and their corrected item-to-total correlations were .04, .09, and .04 respectively.

Item 20, the negatively worded, reverse scored item continues to perform poorly. In fact, Cronbach's alpha for the Work life/Home life dimension improves from .56 to .76 if this item is removed from this factor. The use of negatively worded, reverse-scored items has stimulated much discussion, and there are strong proponents both for and against their use (Hinkin, 1998). This item should be reworded so that in subsequent analyses only nurses who rotate shifts respond to it. To aid in the interpretation of results from this item, additional items should be added to the demographic section of the questionnaire, asking if shift rotation is mandatory, if nurses are allowed to work straight evening or night shifts if that is their preference, and if the hospital offers some type of incentive to rotate shifts. Sixty-six percent ( $n = 209$ ) of the respondents in this study agreed (ratings of 4, 5, and 6) that rotating schedules negatively affected their lives. This item might perform as expected (meaning it belongs in factor 1) if the wording were modified to remove the need to reverse score it.

Items 29 and 30 in factor 3 were problematic (see Tables 18 and 19). Pattern coefficients for these items were .06 and .00, respectively and their z-tests were not significant at  $p < .05$ . Cronbach's alpha for factor 3 was .88 and Cronbach's alpha with these items removed remained .88, which may be in

part due to the high number of items ( $n = 21$ ) in this factor. As described earlier, 95% ( $n = 323$ ) of the respondents agreed that it is important to have a designated, private break area for nurses and 80% ( $n = 270$ ) agreed it was important to have nursing degree-granting programs on site. These items should be retained for further testing as they enhance the QNWL questionnaire's ability to diagnose the quality of nursing work life in a given hospital setting. Furthermore, the small sample size may have affected the performance of these items. If items 29 and 30 continue to be problematic, they may need to be modified or dropped from the questionnaire. Table 23 provides a summary of these findings.

#### Exploratory Factor Analysis

In light of the CFA results, an EFA was also conducted extracting 2 factors based on parallel analysis. Both the orthogonal and oblique rotations revealed essentially the same findings. Thirty items were contained in Factor 1 and 10 items were contained in Factor 2, while two items (items 37 and 41) were not contained in either factor. An attempt was made to name these two factors (as described on pages 65-66), but no conceptual reason was found to explain the ambiguous results. EFA was able to detect two underlying dimensions of the construct, but these two dimensions are not amenable to being named. Rasch measurement models may be better for understanding the dimensionality of the construct and are described later in this chapter.

### Reliability

The corrected item-to-total correlations and Cronbach's alpha for the questionnaire sub-scales show suspect reliability in three of the four subscales. The questionnaire shows adequate internal consistency reliability for only the work context dimension (Table 18). Internal consistency reliability is a function of both the extent to which items are measuring the same attribute and a function of the number of items. Future revisions might include efforts to delete those few items with low corrected item-to-total correlations in an effort to improve the reliability of the other three dimensions. But as indicated in Table 18, removing some of the items with low corrected item-to-total correlations may either decrease the alpha coefficient for that dimension or alpha would remain the same, rather than improving alpha if the item is deleted. Therefore, removing items to improve the alpha coefficient does not make much sense since one purpose of this questionnaire is to "diagnose" the quality of nursing work life in specific hospital settings. From a practical standpoint it might be argued that the information gathered on an item-by-item basis for all of the items is needed since this information can direct specific managerial actions. And since the alpha coefficient did not always improve when removing an item (items 37, 39, and 41), keeping all the items for further testing is warranted.

### Sample Size and Data Quality

While the overall response rate to the survey was reasonable (48%; n=756), only 341 respondents were staff nurses, charge nurses, or team

leaders eligible to participate in the study. Perhaps a different approach to data collection is needed to obtain as many eligible subjects as possible. While mail surveys provide a greater degree of anonymity, data collection at various work sites may be an alternative approach. However, staff might be hesitant to convey negative feedback that could be linked to them and their work site. Other existing lists may be available to draw future samples from; however, using an existing list is only possible when the owner of the list can manipulate the database as required by the researcher. For example, the Illinois Department of Professional Regulation is not able to manipulate their database to generate a random sample of nurses employed in hospital settings.

The demographic data that described this group of respondents (Table 10) was compared to the population of nurses in Illinois (Marcantonio et al., 1997) in order to understand whether the results obtained here could be explained by respondent demographic characteristics. The respondents in this study were actually more racially diverse, more had obtained BSNs, fewer were married, and more were divorced than the population of nurses in Illinois. The percentage of males who responded was greater than the percentage of male nurses in the population in Illinois, yet the age range of these respondents and the number of dependent children was similar to the population of nurses in Illinois. It would appear that the nurses who responded to this study are in some ways different and in other ways similar to the population of nurses in Illinois. Perhaps the demographic characteristics of these respondents impacted the results obtained here.

The methods used to analyze the data in this study require complete data or some use of data imputation methods. In order to have complete data, listwise deletion was used which resulted in a final sample size of 265. Wright (1996) maintains that deleting respondents alters the interpretation of the standardizing sample. Also, the sample was smaller than the 10 respondents per item recommended for factor analysis by Gorsuch (1983). Replication of this study with a larger sample could provide further suggestions and evidence regarding the essential dimensions of a quality nursing work life and lend additional evidence that supports or refutes the measurement model.

The data obtained here were also slightly positively skewed as evidenced by the values for skewness and slightly leptokurtic as evidenced by the values for kurtosis. Even though graphing techniques revealed normally distributed data. Confirmatory factor analysis using maximum likelihood estimation, as in this study, assumes that data are normally distributed. Since the data in this study were not perfectly normally distributed, this characteristic of the data may be affecting the results. A larger, normally distributed data set may reveal different results.

The model did not fit the data obtained in this study, but the poor results may be due to poor data. A further review of the data may indicate the presence of outliers. Removing any outliers and analyzing those outliers may provide clues as to why the data did not fit the model. Examining why values are extreme relative to most of the distribution may be insightful. A subject may not have followed the instructions carefully or perhaps there were extreme

values from an unusual subject. Examining the data for outliers in people or outliers in the data space and trying to explain the outliers may provide some insight. Once outliers are identified they can be removed and the analyses recalculated. If the results are similar, perhaps the outliers may be ignored. Or maybe removing outliers will result in normally distributed data.

### Summated Rating Scale

The sum of the item scores is assumed to be a reliable indicator of the respondent's score on the construct (van Alphen et al., 1994). The meaning of the total scale scores obtained in this study can only be interpreted in relation to some frame of reference. Since this is an initial study, a frame of reference has not yet been established.

Like many questionnaires, this was developed with a limited population, and the results obtained here are from the sample described in Table 10. This presents a problem for generalization beyond the actual population sampled. Should the researcher decide to continue to use the classical test theory approach, then one would collect data with the questionnaire on as many respondents as possible in an effort to establish norms. A thorough series of studies is required to establish norms, as well as to indicate whether subpopulations have different norms. Additional reliability and validity studies should provide data that can be added to the norms of the questionnaire (Spector, 1992). This work can begin once new data are tested to determine the fit using the revised model. Another possibility is to use a different approach to questionnaire development which may enhance generalizability.

While a summated scale score may be of value, examining the responses on individual items in conjunction with the total scale score may be more illustrative of the quality of nursing work life in a particular setting.

### Rasch Measurement

Historically, classical test theory has been the predominate approach to questionnaire development in nursing. Typically, aggregated data are used to measure a construct and, as a result, individual variability may be lost. These questionnaires are often designed as summated rating scales, where the same total score may be reached through numerous combinations of responses to items. This approach makes it difficult to distinguish between how subjects respond to individual items, since the scale score does not provide specific information about each item or the subject's response to each item. Frequently in nursing research, there is a need to be able to locate individuals who are different from the group both prior to and after treatment and upon completion of a program, intervention, or treatment. In addition to these scaling challenges, classical test theory has other weaknesses.

Classical test theory is characterized by only one definition of error, meaning that an observed score can be decomposed into a "true" score and a single, undifferentiated source of random error (Waltz et al., 1991). There is no way for the researcher to choose among different possible sources of error when selecting which estimates of reliability to use. Additionally, scores obtained from different sets of items intending to measure the same construct are not comparable, scores are sample dependent, and raw scores obtained for

persons and items are not on a linear interval scale. Classical test theory also relies on inter-item correlations to make decisions about the unidimensionality of the questionnaire (van Alphen et al., 1994).

The domain-sampling model evolved from classical test theory and was used in this study as the approach to domain identification and item selection. This model considers every measure to be composed of a random sample of items from a hypothetical content domain which it purports to measure (Waltz et al., 1991). According to this model, the extent to which any sample of items from the domain is correlated with the true score is an indication of reliability. Items generated from the domain in this manner are often attached to Likert-type rating scales. Data from Likert scales are on an ordinal scale of measurement, obtained from counting observed steps, and are subject centered. Subject centered means that the scale focuses on the location of individuals on the underlying continuum. One shortcoming of ordinal rating scales for assessing pre-post gains is that they “may mask ineffective treatment and hide effective methods” (Merbitz, Morris, & Grip, 1989; Smith, 1999, p.4; Wright & Linacre, 1989).

During the stage of construct validation that involves the statistical analysis of data, factor analysis is often used to examine the factor structure of the raw data. Raw data used in factor analysis are not linear measures, but rather the raw data are merely labels for nominal qualities that are placed on an ordinal scale (Wright, 1996). In this study, the data were generated from an ordinal, rather than an interval scale of measurement. Coupled with these data

flaws, factor analysis procedures include many different extraction techniques. Factor analysis is an approach that has been criticized because “factor analysis results are unstable. Many have replicated the same set of items with a new sample of persons, only to find the factor sizes and loadings seldom reproduce” (Wright, 1996, p. 10). This then makes construct validity challenging.

While classical test theory, Likert-type rating scales, inter-item correlations, and factor analysis have adherents as an approach to questionnaire development, other researchers prefer item-response theory approaches. As an alternative approach, Rasch measurement is considered preferable by its adherents because it quantifies error at every level of the variable, results in interval units of measurement, and provides estimates for both subjects’ ability and item difficulty that are freed from the sampling distribution of the other facet if the data fit the model.

Rasch measurement falls into the broad category of item response theory, otherwise referred to as latent trait theory, which enables the researcher to examine both item difficulty and the subjects taking the test at the level of every item by subject interaction. Rasch measurement theory is probabilistic in that a person with a higher ability always has a higher probability of endorsement (or success) on an item than a person with lower ability regardless of items attempted (Smith, 1999). Likewise, a more difficult item always has a lower probability of endorsement (or success) than a less difficult item regardless of the person attempting the item.

Key features of Rasch models are uni-dimensionality, additivity, and order. Uni-dimensionality means that that all items are measuring a single construct (Lusardi & Smith, 1997). Additivity refers to the ability to add measurement units together. These measurement units, called logits (log odd units), are interval measures. Unlike ordinal scales, where the distance between the numbers on the rating scale are not equidistant, logits are the same length with respect to observing the “event.” Furthermore, there is an order to the numbers on the scale, meaning that the higher the number the more the characteristic is present.

In Rasch measurement there is both a measure of the person and a calibration for the items. “Rasch measurement depends on separating candidate ability from task difficulty, grader severity, and item difficulty” (Wright & Linacre, 1989, p. 857). The degree to which these properties hold depends on how closely the data fit the model. When the data fit the model, the latent trait can be measured on an interval level. Rasch models are also capable of handling incomplete data (Lusardi & Smith, 1996; Wright, 1996).

Rasch measurement is not without its limitations, however. The complexities of Rasch measurement may have delayed its adoption as a means to construct measures in nursing and, indeed, it is hardly mentioned in the nursing literature. Few nursing instruments have used this approach, so classical test theory remains the dominant approach to instrument development in nursing (O. Strickland, e-mail communication, August 12, 2000). Van Alphen et al. (1994) found that a Medline search from 1983-1992

for Rasch measurement retrieved only one nursing article and concluded that this is probably because researchers were unfamiliar with this method. While the approach to generating items based on domain sampling theory is clear, methods for developing items specifically to be Rasch analyzed are less well known, but very clear. Item generation for Rasch measurement uses a variation on the domain sampling approach. Items are written so that some are difficult to endorse, some are easy, and others are moderate. These items are then laid out on a line from easy to difficult, and in this way researchers explicitly state their expectations regarding domain sampling (E. Smith, e-mail communication, October 26, 1999) which then are either verified or contradicted by the empirical item difficulty estimate, a construct validity issue.

*Measurement in Nursing Research* (Waltz et al., 1991), a major nursing measurement textbook, does not mention Rasch as an approach to questionnaire development so it is difficult for nurse researchers to learn about the method and its uses. *Statistical Methods for Health Care Research* (Munro, 2001) does not include Rasch measurement either. Computer software, (BIGSTEPS) has been developed to handle the complex mathematical calculations of Rasch measurement, however this software is not sold commercially from large statistical software vendors; it must be purchased directly from those who developed it (Linacre & Wright, 1995).

Even though there is controversy as to the best approach to use in the measurement of any construct, Rasch measurement is a viable alternative to

classical test theory and would be helpful in the further development of the QNWL questionnaire as it would provide more detailed information regarding the items on the questionnaire as well as the respondents. If Rasch was used in further development of the QNWL questionnaire, the questionnaire would appear as it does in Appendix B, meaning the directions would be the same, the Likert-rating scale would remain, and subjects would respond in the same manner to each item as they did in this study. But, some differences would be the way in which items for the questionnaire are developed (items are written so that they are progressively more difficult to endorse), how items are ranked by the researcher in a line in terms of their difficulty, as compared with empirical item difficulties as evidence of construct validity, and the manner in which data are analyzed and reported.

#### Utility and Future Directions

Nunnally and Bernstein (1994) point out that standardized measures are valuable because they are objective, produce quantifiable results, are economical to use, allow consistent communication of findings, and can be used to make scientific generalizations. The current study is the first step in developing a standardized measure to assess the quality of nursing work life. However, the value of any standardized measure is predicated on whether those who ask the questions intend to “fix” those areas that staff nurses reveal to be inadequate. In fact, this is clear from the comments of three respondents in the study: “The employers of the world seem to think that nurses owe them their time and opinions. When will you learn and respond to our concerns?,” “I

don't know what this survey is for. I have repeatedly been asked questions like these, but no one does anything about the problems in nursing," and "I agree with your research project in principle, but nursing issues will never be addressed due to the bureaucracy and politics within all healthcare organizations. Words of wisdom to you—let it go."

In many ways, the staff nurse comments in this study mirror the comments of other nurses who have been asked about their work life (Davis & Thorburn, 1999; McGirr & Bakker, 2000). Even though the aim of this study was questionnaire development, the findings indicate that nurses' concerns about their work life remain unresolved at best, and in some cases are actually deteriorating. Nursing job satisfaction, turnover, workload, staffing issues, skill mix, communication, autonomy, rewards, recognition, and empowerment remain problematic. In fact, landmark studies have been conducted over the years that examined the work of nurses, the cyclical shortages that plague the profession, and magnet hospitals, yet the recommendations made in these studies have either not been instituted with any kind of long-term commitment or recommendations were only implemented temporarily during a "crisis" to alleviate the acute shortage (Aiken, 1984; Aiken, Havens, & Sloane, 2000; Donaho, 1996; Kellogg, 1989; Roberts, Minnick, Ginzberg, & Curran, 1989). The nursing profession is aware of the workplace issues that are of concern to nurses, yet little is being done about these underlying issues.

Many of the nurses who were eligible to participate in this study took time to provide a variety of comments on the state of their work lives.

Unfortunately, in many cases their comments are no different from the findings of the landmark studies. To be sure, some of the issues nurses raised here may be situational, affected by supply and demand, or a reflection of managed care's impact on patient care. Had this study been conducted in the mid-1990s when there was no nursing shortage, the responses may have differed. Yet, this study revealed that there remain ongoing and fundamental work life concerns for staff nurses that the profession has neither addressed nor resolved in any meaningful, long term way. Perhaps if the issues raised by nurses during previous shortages had been addressed, members of the profession would not make comments about stress, burnout, and the quality of patient care as described below. The following discussion related to the implications of these findings is organized as follows: first, findings and implications are discussed that are germane to the profession as a whole, then findings and implications relevant to nurse executives, then findings and implications dealing with interactions between the staff and the nurse manager are reviewed, and finally future research implications are discussed.

#### Implications for the Nursing Profession

The nursing profession has once again embarked on efforts to improve society's image of nursing and to attract people into the profession. Nearly 74% (n=248) of the nurses in this study agreed that society does not have an accurate image of nurses. Sigma Theta Tau International, Honor Society for Nursing has a new Web site Nurses for a Healthier Tomorrow ([www.nursesource.org](http://www.nursesource.org)). It promotes an effort by a coalition of 18 nursing and

health care organizations working together to wage a 36-month national communications campaign to share information about nursing and careers in nursing with the public. But if members of the profession are disillusioned with the profession, the effectiveness of these efforts is likely to be limited. One respondent commented: "I graduated with an ADN in nursing in '94 and started working in May '95 at the age of 47. I have a bachelor's degree in home economics ('74). I am very disillusioned with the profession of nursing. It is outrageous what nurses are expected to do in the time frame allotted." And another stated: "I just graduated from nursing school. I'm 23 years old. At no time in my education was I prepared for what I've encountered in the hospital. I am looking to leave the profession."

Even though 78% (n=265) of the respondents agreed they were able to provide quality patient care, one respondent commented: "I am horrified by what I perceive to be a shocking decline in quality of care given to patients. I am also dismayed by an overall decrease, if not abandonment, of professionalism among the nurses of my hospital." Another stated that "patients deserve better care than I am able to provide. I can't stand feeling like I'm providing inadequate care. I'm leaving the profession."

*The Nursing Spectrum* magazine, in collaboration with the National Student Nurse's Association ([www.nsna.org](http://www.nsna.org)), has developed a videotape, *Nursing—the Ultimate Adventure*, to recruit young people into nursing as the number of people entering the nursing profession has been on a steady decline (Bednash, 2000; Buerhaus, Staiger & Auerbach, 2000). One respondent, who

was not eligible to participate in this study, did comment that she was “not working as a nurse any more. In my town factory workers make as much money as nurses with better benefits, less stress, and less liability. I would never recommend nursing as a career to my children.”

Not unexpected were the respondents’ views on salary. Only 57% (n=194) viewed their salary as adequate. Many nurses commented on their low salaries, salaries that were not competitive with other industries, and the lack of shift differentials or bonus programs for those who rotate shifts. One nurse commented, “I am not going to work in nursing any longer. I am overworked and underpaid—my sister’s Christmas bonus was more than I made the last year I worked.” Buerhaus and Staiger (1997) found that nurse salaries have not increased in the 1990s commensurate with increasing responsibilities, nurse educators are not responding quickly enough to the need to prepare nurses for the rapidly changing healthcare industry, and in their study they surveyed healthcare executives who are concerned about the registered nurse workforce.

#### Implications for Nurse Executives

Nurse executives can learn a great deal from this study in terms of those discretionary employee benefits that enhance the work life of nurses. In collaboration with their colleagues in human resources (Millikin, Martins & Morgan, 1998; Witkowski, 1998), they can develop and implement employee benefit programs that would improve the work life of nurses. Two nurses commented: “I’m leaving hospital nursing not because of salary but because of failure to provide support services to decrease burnout,” and “I am working in a

hospital, but the stress is too much.” Many nurses in this study (66%, n=226) were unable to balance work with their family needs. One nurse stated “because of extensive call requirements, staff shortages, rotating shifts, poor nurse patient ratio, and unsupportive management. My family was suffering.” Sixty-six percent (n=209) of the respondents agreed that rotating shifts negatively affected their lives and many commented that salaries, shift differentials, and bonus programs for off-shifts had been decreased or eliminated. Many of the respondents agreed (78%, 72%, and 56% respectively) that on-site child care, on-site child care for an ill child, and on-site day care for elderly parents was important. The staff nurses in this study were also concerned about their safety in the work place. Only 64% (n=181) agreed that the security department provided a secure environment, and only 66% (n= 222) of the nurses felt safe from personal harm. One nurse commented, “Security needs to be increased to allow the nurse to perform her duties without fear.”

Two items in the questionnaire, items 35 and 38 respectively, ask whether the security department provided a safe environment and whether the nurse felt safe from personal harm. These items provide insight into nurses’ feelings about their safety at work. These two items on the survey may be of interest to such organizations as the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), the Occupational Safety and Health Administration (OSHA), and the American Nurses Association (ANA) as these organizations are developing policies and regulations aimed at decreasing violence in the workplace. Both OSHA and the ANA have issued guidelines to

assist healthcare providers in preventing workplace violence. The publications developed by these two organizations outline risk factors, prevention strategies, and stress the assessment of the workplace to identify workplace violence risk factors (<http://www.osha-slc.gov/SLTC/workplaceviolence/guideline.html> and <http://www.nursingworld.org/dlwa/osh/wp5.htm>). Since this questionnaire has been designed to help identify targeted areas for improvement, hospitals could use these two questionnaire items to begin to assess workplace violence risk factors.

Hospital units are required to log incidents or injuries for tracking and reporting purposes. While this is a Federal requirement mandated by OSHA, JCAHO hospital accreditation includes standards related to employee safety in the environment of care. A partnership between JCAHO and OSHA has been established whereby data on employee incidents and injuries is only collected once, but is reported to both regulatory bodies. If hospitals assess the workplace and identify areas of employee safety needing improvement, and steps are not taken to improve the environment, the outcome is a record of non-compliance with pertinent regulations. OSHA and the JCAHO can then cite a hospital for failure to correct the deficiency. Assessment of the workplace to identify violence risk factors, with no corrective action plan or evaluation of the effectiveness of specific interventions, can be viewed by regulatory agencies as not doing anything to prevent workplace violence. The data gleaned from the two employee safety items could assist hospitals in this regard.

### Implications for Nurse Managers

The staff nurses raised many issues centered around their relationships and interactions with the nurse manager, focused primarily on being recognized for accomplishments, and having adequate support and supplies. Only 50% (n=187) of the respondents agreed they were able to participate in decisions made by the nurse manager. One respondent commented, “Question #33 (I am recognized for my accomplishments by my nurse manager) is the most important question on the survey.” While 70% (n =236) of the respondents agreed they had adequate supplies and equipment, one nurse commented that “short of doing the hospital laundry, nurses do everything else. We have no transporters on nights, we run out of clean linen by 7 p.m., and are always out of supplies.” Even though most respondents (76%, n= 257) agreed there was teamwork in their work setting and that friendships with coworkers are important (75%, n=295), one male nurse commented on “the gossiping and constant chatter regarding other people and their affairs that occurs on my unit is extremely tiring.” Even though this study did not directly ask about the effectiveness of the nurse manager, one nurse commented, “The turnover on my unit is horrendous. The nurse manager can’t even figure out how to staff the unit appropriately. It’s not all her fault though, no one is helping her learn how to be a good manager.” These quantitative and qualitative findings point to areas that the nursing profession, nurse executives, and nurse managers can strengthen and improve that reflect similar issues uncovered in the magnet hospital study (Kellogg, 1989) and

other more recent attempts to understand what contributes to a quality work life for nurses (Al Ma'aitah et al., 1999; Davis & Thorburn, 1999; McGirr & Bakker, 2000).

### Future Research

#### Using Sociotechnical Systems Theory

This study was not about the use of or effectiveness of STS theory in redesigning work settings, but rather this study used STS as a guide for the development of empirical referents for the construct. Since the QWL construct was coined by the experts who developed STS theory (Davis, 1975), using STS theory to assist in identifying empirical referents was desirable since there needs to be obvious correspondence between theory and the items on a measure (Oberst, 1994). Used in this way, STS theory provided many important clues to empirical referents and was useful in this regard. Modifying the theory in any way to guide instrument development does not seem to be needed.

But, whether there is a role for STS theory in redesigning nursing work settings to jointly optimize both the social and technical subsystems, while meeting the organization's goals remains unclear. Some maintain that innovative new work designs are imperative and that research is needed to test these new designs (Donner, Semogas & Blythe, 1994). But whether STS theory is a means to this end is uncertain. Little empirical evidence exists in nursing as to the effectiveness of STS as a work redesign approach. Only one published study in nursing employed STS in the redesign of a critical care unit, but this

study like many, focused on modifying only one aspect of the unit. In this study, only the social subsystems were modified (Song et al., 1997), rather than simultaneous modification of social and technical subsystems. Perhaps as new hospitals are built, nursing staff can participate in the actual design of the facility. Specifically, staff can provide input into how patient rooms are designed, they can indicate the best location for bedside equipment, staff can help determine the location of supplies in patient rooms for easier access, and staff can help design the layout of the patient care unit in terms of the location of supply and equipment storerooms, as well as the location and size of the nursing station. In this way, the technical aspects of the work setting can be modified. Then, the challenge would be to modify various aspects of the social subsystem in order to utilize STS as a work design approach. But, hospital workplace design efforts of this type have been quite rare.

It seems researchers still believe that STS remains a viable method to redesign work (Adler & Docherty, 1998; Applebaum, 1997; Heller, 1997; Herndon, 1997; Majchrzak, 1997; Taylor & Felton, 1993), yet this approach to work redesign is still used incorrectly (Emery, 1995; Hacker & Kleiner, 2000; Majchrzak, 1997; Song et al., 1997). And in fact, many of the criticisms of early STS theory research still remain (Adler & Docherty, 1998; Cohen-Rosenthal, 1997; Pasmore, 1988; van der Zwaan, 1975, 1994; van Eijnatten, 1993). In many of these studies, both the social and technical sub-systems were not modified simultaneously. Perhaps, if STS was used properly to guide work redesign efforts it would be an effective method to redesign work. Emery (1995)

maintains that the original intent of STS theory is still viable and his current work is aimed at trying to simplify the process of redesigning work so that anyone can understand and use STS theory. His work may facilitate the use of STS theory in nursing care delivery settings. Any recommendations aimed at revising STS theory at this time seem premature, especially in light of the results obtained here. The less than positive results obtained here might be related to sample size and data quality issues described earlier.

#### Using the Conceptual Framework

The framework, devised by researchers from the Quality of Nursing Worklife Research Unit (QNWRU), was originally used to “categorize loosely into four main programs of research, the research agenda of the unit” (O’Brien-Pallas, Baumann, & Villeneuve, 1994, p. 14). The loose categories were derived from the detailed model (Figure 1) into four general areas of study: work life/home life, work design, work context, and work world. One member of the QNWRU believed that the model, while useful to organize the work of the research unit, may not be robust enough to have four dimensions and perhaps only had three dimensions. She mentioned she was curious to learn how the framework would “bear up under empirical testing” (A. Baumann, personal communication, May 10, 1995). The findings in this study did not support the conceptual framework. Yet, this framework remains valuable as a beginning step in understanding nursing work life. The results obtained here could be a function of poor data quality, but more likely there are problems with the framework.

Even though the conceptual framework provided a frame of reference for placing instrument items into dimensions of nursing work life, the untested framework did not adequately fit the data which makes the framework suspect. Future efforts to refine this QNWL questionnaire need to begin with a reexamination of the framework.

Perhaps the four dimension conceptual framework that was used as the measurement model was not adequate because the research conducted that led to the development of the framework studied all nurses, in a variety of settings, not just staff nurses in hospital settings as was the case in this study. Too, the initial qualitative work was conducted in Canada and there may be differences in nursing and nurses between the two countries that impacted the results. The two qualitative studies conducted previously (Attridge & Callahan, 1990; Villeneuve et al., 1995) may not have provided the necessary data or enough data to provide support for a construct as broad as QNWL. While the work begun in this study can proceed with a larger data set to determine whether or not data quality impacted the results, concurrently additional qualitative research to further elucidate a model of nursing work life is needed. There may be an alternative framework that is in fact more reflective of the construct QNWL.

Future model development could use the five dimensions of QWL outlined in Taylor (1978). The five dimensions derived by Taylor (current issues, social work environment, growth and development, employer's QWL, and society's QWL) lend evidence that the framework describing work life may

in fact be broader than four dimensions. Taylor's five dimensions contained items both similar and different from the items contained in the four dimensions of this questionnaire. But more importantly, Taylor's five dimensions show little similarity to the dimensions as outlined in the conceptual framework (work life/home life, work design, work context, work world). So, the framework used here is suspect. But, should Taylor's framework be used for further QNWL research, item development from Taylor's dimensions would need to use language specific to nurses and hospital settings.

Another alternative model might be the seven dimensions of nursing work life described by Attridge and Callahan (1990). Attridge and Callahan describe seven categories that resulted from the sorting of items generated by Canadian registered nurses. These categories (human and other resources, characteristics of the organization, nature of nursing work, work-related benefits, collegial relationships, self-career development, and acknowledgement of value) do show some similarities, but some differences related to the conceptual framework are also evident. Seven dimensions may explain the broad QNWL construct better than the four dimensions used here and if these categories are used for further model development, additional qualitative research with American nurses would be required.

Both of these models could be used as templates for further instrument development in order to measure the quality of nursing work life, but this would require extensive testing to determine if one of these alternative models is better. Since the existing four dimension model is inconclusive, other models

should be tested. And since the quality of nursing work life is a significant work force issue, at some point the nursing profession will need to understand nursing work life.

### Measuring QNWL

Developing any new instrument is a complex and difficult process that evolves over time. This study was only the first step in such an effort and further research remains to be done before this instrument can be used in any empirical studies. In this study, identifying empirical referents of the construct, an important step in instrument development, was straightforward given the amount of previous published work describing empirical referents for QWL and QNWL (Attridge & Callahan, 1990; Levine, Taylor & Davis, 1984; Taylor, 1978; Villeneuve et al., 1995; Walton, 1975). In addition, using STS theory as a guide to developing empirical referents facilitated this phase of instrument development as well. Even the content validity stage of instrument development (conducted with seven experts), revealed that the questionnaire items derived from the empirical referents were part of the domain. Where the process of developing a questionnaire to measure QNWL became more difficult was in using an untested conceptual framework as the measurement model.

This study attempted to measure a construct where there is no underlying framework that has been adequately supported by a large number of qualitative studies. This lack of qualitative work may have resulted in the model being flawed. And if the model is flawed, constructing an instrument to measure QNWL based on the model will not adequately explain the

phenomenon. This then makes the development of a questionnaire to measure QNWL difficult, which will remain difficult until such time that a better model is developed and tested. But, regardless of the ultimate format of the questionnaire, understanding that the work life of nurses is a complex interaction of nurses' roles as family care providers and employees who interface with, and are impacted by, the world at large was learned during this study.

### Conclusion

Minimal research attention has been directed to staff nurse perceptions about the quality of their work life. This research provides a beginning step in addressing this important issue by developing a questionnaire to assess QNWL. Further development of the questionnaire is needed to understand the underlying dimensionality of the construct. In the meantime, the QNWL questionnaire might reasonably be used to efficiently gather data regarding staff nurse perceptions of their working lives. The challenge is to learn more about QNWL and then implement lasting, long-term strategies that have a real impact on improving nursing work life. The time to address the fundamental underlying problems is now, problems that will continue to plague the profession. What is also needed is outcome-driven research that examines the effectiveness, efficacy, and cost-benefit analysis of specific strategies aimed at improving the quality of nursing work life and organizational productivity.

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TABLE 1

Quality of Nursing Work Life Issues

## Internal Environment

## Individual Factors

- Self-concept
- Life values
- Home-work interplay
- Day care
- Respect and recognition in workplace

## Social/Environmental/Contextual Factors

- Communication
- Management style
- Decision-making
- Work teams
- Physical environment
- Inter-professional relations
- Advancement, career ladders

## Operations

- Work design and workload
- Technology, equipment, materials
- Schedules, shift work
- Staffing mix
- Care delivery models
- Smooth workflow

## Administration

- Policies and procedures
- Performance appraisal
- Management philosophy
- Wages and benefits

## External Environment

## Client Demand on System

- Demographic changes
- Aging population
- Increasing chronicity of diseases
- Shorter length of stay
- Client/patient empowerment

TABLE 1 (continued)

## Healthcare Policy

- Funding for healthcare
- Changing laws and regulations
- Community-base care, wellness
- Maintain or improve quality

## Labor Market Conditions

- Number of available positions
- Ratio of nurse to non-nurse providers
- Availability of existing applicant pool
- Unionization
- Role of professional organizations

Note. From "Quality of nursing worklife issues: A unifying framework," by L. O'Brien-Pallas and A. Baumann, 1992, Canadian Journal of Nursing Administration, 5(2), 12-16. Copyright 1992 by Canadian Journal of Nursing Administration. Adapted with permission of the author.

TABLE 2

Quality of Nursing Work Life Conceptual Framework

**Work life/Home life Dimension**--defined as the interface between the life experiences of nurses in their place of work and in the home.

interactions between nurses' work and home worlds  
 career planing  
 dual caring role of nurse and parent

**Work Design Dimension**--defined as the composition of nursing work and describes the actual work nurses do.

nature of nursing work  
 expanded nursing roles  
 decision making, autonomy  
 staff mix  
 physical, verbal, or sexual abuse  
 nursing workload  
 number and type of non-nursing tasks  
 delegation to unlicensed assistants  
 job satisfaction

**Work Context Dimension**--defined as the practice settings in which nurses work and explores the impact of the work environment on both nurse and patient systems.

work environment  
 stress  
 management practices  
 scheduling  
 shift work  
 feedback on performance  
 recognition from manager  
 teamwork

TABLE 2 (continued)

**Work World Dimension**--defined as the effects of broad societal influences and changes on the practice of nursing.

nursing's value to society  
unions  
changes in educational requirements  
downsizing  
health care policy  
labor markets

Note. From "Research unit probes quality of worklife, " by L. O'Brien-Pallas, A. Baumann, A. and M. Villeneuve, 1994, The Registered Nurse, 6(1), 14-16.

TABLE 3

Quality of Work Life Empirical Referents

Walton (1975)	Taylor (1978)	Levine, Taylor, & Davis (1984)
<p><b>Adequate and Fair Compensation</b> adequate income fair compensation</p> <p><b>Safe and Healthy Working Conditions</b> reasonable hours physical working conditions age limits</p> <p><b>Use and Develop Human Capacities</b> autonomy multiple skills information and perspective whole tasks planning</p> <p><b>Growth and Security</b> security advancement opportunities development of skills prospective application</p>	<p><b>Adequate and Fair Compensation</b> good pay fringe benefits types of compensation</p> <p><b>Safe and Healthy Working Conditions</b> convenient working hours safe conditions low work-related stress low work-related disease</p> <p><b>Growth</b> able to use knowledge and skills able to grow and learn challenging jobs</p> <p><b>Security</b> job security career opportunities</p>	<p><b>Adequate and Fair Compensation</b> salary equities benefit equities reward/recognition</p> <p><b>Safe and Healthy Working Conditions</b> work hours flexible, set own hour amount of shift work comfortable physical conditions, atmosphere work pressures, overload</p> <p><b>Use of Capabilities</b> autonomy receive proper training work with equipment/machines involved in planning able to grow and learn feedback challenging work task variety, design procedures, practices, methods facilitate work</p> <p><b>Security</b> job security company stability advancement opportunities fair reviews</p>

TABLE 3 (continued)

Walton (1975)	Taylor (1978)	Levine et al. (1984)
<p><b>Social Integration</b>  freedom from prejudice  egalitarianism  mobility  supportive workers  community  interpersonal openness</p>	<p><b>Social Integration</b>  joint management-  employee consultation  minimize discrimination  good social relations at  work  no status differences  high employee self-  esteem  trust between levels  open communication</p>	<p><b>Social Integration</b>  treated with respect from  superiors  personal social  interaction  meet people  teamwork, cooperation  communication  trust</p>
<p><b>Constitutionalism</b>  privacy  free speech  equity  due process</p>	<p><b>Constitutionalism</b>  fairness  free speech  equity  due process</p>	<p><b>Constitutionalism</b>  fair and just treatment</p>
<p><b>Work life</b>  work and life balance</p>	<p><b>Work life</b>  adequate transportation  able to enjoy life outside  work  employee interest in  community affairs</p>	<p><b>Work life</b>  travel time, parking  balance with home and  other interests  time off work to take  care of  personal business</p>
<p><b>Social Relevance of Work</b>  social responsibility</p>	<p><b>Social Relevance of Work</b>  socially desirable work</p>	<p><b>Social Relevance of Work</b>  work contributes to  society</p>
	<p><b>Employer's QWL</b>  high productivity  loyalty to organization  improve employee  motivation  reduce theft/sabotage,  abuse of equipment  minimize lost time  improve productivity  increase morale  reduce waste</p>	<p><b>Employer's QWL</b>  valuation of product-  quality vs. quantity  company cares about  employees' human  needs  self-esteem</p>

TABLE 3 (continued)

**Societal QWL**

effective, active unions  
union loyalty  
low unemployment rates  
recreational facilities

**Societal QWL**

work contributes to  
society  
pride in work  
prestige of job  
cafe, recreation facilities

TABLE 4

Quality of Nursing Work Life Empirical Referents

Attridge &amp; Callahan, 1990

**Characteristics of the Organization**

characteristics of physical plant  
 clarity and visibility of philosophy,  
 purpose, policy structure  
 consistent application of policies,  
 procedures that support nursing  
 work  
 participative management  
 communication, feedback  
 freedom of expression (without  
 retribution)  
 all parts of system (staff and patients)  
 valued equally

**Human and Other Resources**

staffing availability and adequacy  
 staff competence  
 availability of supplies, equipment

**Nature of Nursing Work**

organization of work  
 hours, scheduling, breaks  
 flexibility with management  
 able to choose work site  
 able to determine content of work  
 able to include patient teaching,  
 follow-  
 up, able to include family  
 autonomy  
 dress code  
 tolerable stress  
 more power for nursing  
 smooth work flow

**Work-related Benefits**

salary  
 benefits  
 personal well being  
 safety  
 day care

Villeneuve et al., 1995

**Work life/Home life Interactions**

work negatively affects home life  
 work affects nurses' health  
 day care  
 fatigue

**The Work Itself**

skills not utilized  
 workload too great  
 increased patient acuity/expectations  
 too many non-nursing tasks  
 multiple demands  
 time pressures  
 unclear or changing RN role  
 concerns about quality care

**Personal Satisfaction and Feelings About Work**

autonomy/independence  
 able to make decisions  
 feedback from organization, patients  
 no voice, loyalty, commitment  
 feel valued, respected  
 professional satisfaction  
 stressed/frustrated

TABLE 4 (continued)

**Collegial Relationships**

quality of professional  
relationships with peers,  
administrators, non-nurse others  
approachable  
non-condescending  
non-judgmental  
receptive  
supportive  
honest

**Self-career Development**

financial assistance for education  
in-house educational opportunities  
incentives for ongoing learning  
access to BSN program

**Acknowledgment of Value**

nurses valuing themselves  
nurses valued by administration,  
MDs,  
and others  
respect for nursing work  
value of nursing work

**Work Setting Issues**

pleasant physical environment  
personal safety  
positive work environment  
relations with MDs, peers, other staff  
teamwork  
communication, feedback  
abuse from MD, patients, families,  
visitors  
inadequate staffing  
"bumping," "pulling"  
scheduling practices  
availability of technology/equipment

**Management/Leadership Issues**

inadequate leadership  
too focused on budgets rather than  
patient care  
management top heavy, inconsistent  
inadequate management support  
obstructive management

**Societal/Work World Issues**

job security/downsizing  
public's perception of nurses/nursing  
professional status  
politics affect care giving  
patient's rights causing conflicts  
valued by patient/family

TABLE 5

Four Dimensions of the Conceptual Framework with Related Instrument Items**Work life/Home life Dimension**

Defined as the interface between the life experiences of nurses in their place of work and in the home.

**Instrument Items (n=8)**

- 5. I am able to balance work with my family needs.
- 10. I am able to arrange for child care when I am at work.
- 12. I have energy left after work.
- 20. I feel that rotating schedules negatively affect my life.
- 25. My organization's policy for family-leave time is adequate.
- 27. I am able to arrange for day care for my elderly parents.
- 36. I am able to arrange for day care when my child is ill.
- 37. I often "bring work home" with me.

**Work Design Dimension**

Defined as the composition of nursing work and describes the actual work nurses do.

**Instrument Items (n=10)**

- 1. I receive a sufficient amount of assistance from unlicensed support personnel.
- 2. I am satisfied with my job.
- 3. My workload is too heavy.
- 6. I have autonomy to make patient care decisions.
- 11. I perform many non-nursing tasks.
- 16. I experience many interruptions in my daily work routine.
- 17. I have enough time to do my job well.
- 18. There are enough RNs in my work setting.
- 23. I am able to provide good quality patient care.
- 43. I receive quality assistance from unlicensed support personnel

**Work Context Dimension**

Defined as the practice settings in which nurses work and explores the impact of the work environment on both nurse and patient systems.

**Instrument Items (n=20)**

- 7. I am able to communicate well with my nurse manager/supervisor.
- 8. I have adequate patient care supplies and equipment.
- 9. My nurse manager/supervisor provides adequate supervision.
- 13. Friendships with my co-workers are important to me.
- 14. My work setting provides career advancement opportunities
- 15. I feel like there is teamwork in my work setting.
- 19. I feel like I belong to the "work family."

TABLE 5 (continued)

- 21. I am able to communicate with other therapists (physical, respiratory, etc.).
- 22. I receive feedback on my performance from my nurse manager/supervisor.
- 26. I am able to participate in decisions made by my nurse manager/supervisor.
- 28. I feel respected by physicians in my work setting.
- 29. The nurses' lounge/break-area/locker room in my setting is comfortable.
- 30. I have access to degree completion programs through my work setting.
- 31. I receive support to attend inservices and continuing education programs.
- 32. I communicate well with the physicians in my work setting.
- 33. I am recognized for my accomplishments by my nurse manager/supervisor.
- 34. Nursing policies and procedures facilitate my work.
- 35. I feel the security department provides a secure environment.
- 39. I feel safe from personal harm (physical, emotional, or verbal) at work.
- 41. I feel that upper-level management has respect for nursing.

#### Work World Dimension

Defined as the effects of broad societal influences and changes on the practice of nursing.

#### Instrument Items (n=5)

- 4. I believe that, in general, society has the correct image of nurses.
- 24. My salary is adequate for my job given the current job market conditions.
- 38. I would be able to find the same job in another organization with about the same salary and benefits.
- 40. I feel my job is secure.
- 42. I believe my work impacts the lives of patients/families.

TABLE 6

Summary of Quality of Work Life Research Literature

QWL studied as a Variable	<p>Baba &amp; Jamal, 1991  Boisvert, 1977  Efraty &amp; Sirgy, 1990  Igbaria et al., 1991  Levine, Taylor, &amp; Davis, 1984  Nachmias, 1988  Pelsma et., 1989  Sashkin &amp; Lengermann, 1984  Shamir &amp; Salomon, 1985  Smith &amp; Nock, 1980  Taylor, 1978  Walton, 1974</p>
QWL studied as an Approach	<p>Cutcher-Gershen, 1991  Eaton, Gordon, &amp; Keefe, 1992  Fields &amp; Thacker, 1992  Gilbert, 1989  Jimeno &amp; Carney, 1985  Peterson &amp; Tracy, 1992  Thacker &amp; Fields, 1987</p>
QWL studied as a Method	<p>Cummings et al., 1975  Golembiewski &amp; Sun, 1990b  Havlovic, 1991  Igbaria et al., 1991  Katz, Kochan, &amp; Weber, 1985  Marks, Mirvis, Hackett, &amp; Grady, 1986  Ondrak &amp; Evans, 1986</p>
QWL studied as a Movement	<p>Buback &amp; Grant, 1985  Chisholm, 1992  Gowdy, 1988  Lawler, 1982  Manz &amp; Grothe, 1991  Nykodym, Longenecker, &amp; Ruud, 1991  Stein, 1983  Walton, 1980</p>

TABLE 6 (continued)

## "How To" Articles

Buback, 1985  
Camman & Ledford, 1984  
Gadon, 1984  
Nadler & Lawler, 1983  
Slocum, 1981  
Walton, 1972

TABLE 7

Summary of Quality of Work Life Conceptualizations

Joint cooperation between union and management to increase teamwork and worker participation in decision making regarding plant operations, work redesign, and problem solving (union settings).	Cutcher-Gershenfeld, 1991 Eaton et al., 1992 Fields & Thacker, 1992 Gilbert, 1989 Golembiewski & Sun, 1990a Katz et al., 1985 Peterson & Tracy, 1992 Thacker & Fields, 1987
Degree to which individual members of the organization are able to satisfy important personal needs through experiences in the organization (need satisfaction).	Boisvert, 1977 Igbaria et al., 1994 Lawler, 1980 Nachmias, 1988 Pelsma et al., 1989 Sashkin & Lengermann, 1984 Seashore, 1975 Smith, 1981
A means to enhance the productivity of organizations while fulfilling human needs (joint optimization).	Attridge & Callahan, 1990 Baba & Jamal, 1991 Buback, 1985 Chisholm, 1992 Cummings et al., 1975 Efraty & Sirgy, 1990 Gadon, 1984 Golebiewski & Sun 1990b Gowdy, 1988 Havlovic, 1991 Jimeno & Carney, 1985 Kanter & Stein, 1985 Lawler & Ledford, 1982 Manz & Grothe, 1991 Marks et al., 1986 Nadler & Lawler, 1983 Slocum, 1981 Stein, 1983 Suttle, 1977 Taylor & Felton, 1993 Walton, 1972, 1974, 1975, 1980

TABLE 7 (continued)

Joint optimization, but not at the expense of an employee's health, as evidenced by decreases in hazardous work conditions that lead to stress related illnesses such as hypertension, lung cancer, coronary heart disease, and heart attack. In other words, the addition of employee health outcomes to joint optimization.	Karasek & Theorell, 1990
Work restructuring and decision sharing through employee/employer participation in diagnosis, work redesign, and implementation (non union settings).	Ondrack & Evans, 1986
Physical and mental well being of employees.	Lawler, 1982
An attempt to systematically improve employee perception of work group processes.	Nykodym, Longenecker, & Ruud, 1991
Emphasizes the elements of teamwork and empowerment in helping individuals adapt to change.	Cohen, 1992
Individual attitudes—job satisfaction, job involvement, and organization commitment—are the most common assessments of the quality of work life.	Loscocco & Rochelle, 1991

TABLE 8

Pilot Test Item Summary Statistics by Quality of Nursing Work Life Dimension  
(n=58).

Item #	Item Description	Dimension	Range	M	SD	Corrected Item-to-Total r	Alpha if Item Deleted
5	Balance	Worklife	2-6	4.24	0.99	.33	.36
10	Child care	Worklife	0-6	4.88	1.05	.39	.33
12	Energy left	Worklife	1-6	3.36	1.50	.34	.36
20	Rotate schedules	Worklife	0-6	4.48	1.02	.08	.53
25	FMLA policy	Worklife	1-6	4.25	1.27	.06	.47
27	Elder day care	Worklife	0-6	3.66	1.58	.08	.53
36	Ill child care	Worklife	0-6	4.50	1.21	.61	.22
37	Bring work home	Worklife	0-6	3.70	1.64	.13	.44
	N of items = 8						
	Alpha =.45						
1	Enough UAPs	Design	1-6	4.52	0.99	.36	.41
2	Satisfied with job	Design	1-6	4.41	1.10	.27	.44
3	Workload too heavy	Design	1-6	3.89	1.43	.42	.64
6	Autonomy	Design	2-6	4.53	1.11	.36	.41
11	Non-nursing tasks	Design	2-6	4.43	1.25	.02	.52
16	Interruptions	Design	1-6	4.44	1.30	.15	.48
17	Enough time	Design	1-6	3.75	1.35	.37	.41
18	Enough RNs	Design	1-6	3.41	1.47	.34	.42
23	Good quality care	Design	1-6	4.55	1.12	.39	.40
43	Quality UAPs	Design	1-6	4.16	1.38	.30	.43
	N of items = 10						
	Alpha =.49						
7	Communication	Context	2-6	4.56	1.31	.56	.87
8	Adequate supplies	Context	2-6	4.56	1.15	.36	.88
9	Supervision	Context	2-6	4.15	1.32	.57	.87
13	Friendships	Context	1-6	4.46	1.06	.30	.88
14	Advancement	Context	1-6	3.72	1.49	.45	.87
15	Teamwork	Context	2-6	4.53	1.07	.46	.87
19	Belong Work Family	Context	1-6	4.29	1.18	.46	.87
21	Communication	Context	2-6	4.93	0.91	.54	.87
22	Feedback	Context	2-6	4.27	1.28	.51	.87
26	Participate	Context	1-6	3.81	1.29	.68	.88

TABLE 8 (continued)

28	Respect from MDs	Context	1-6	4.08	1.17	.48	.87
29	Nurses' break area	Context	1-6	3.05	1.49	.20	.88
30	Degree completion	Context	1-6	3.89	1.57	.30	.88
31	Inservice/CE	Context	1-6	4.12	1.33	.57	.87
32	Communicate MDs	Context	3-6	4.50	0.90	.52	.87
33	Recognition	Context	1-6	4.08	1.23	.70	.87
34	Policy/Procedures	Context	2-6	4.08	1.06	.57	.87
35	Security Depart.	Context	1-6	3.84	1.26	.36	.88
39	Safety	Context	2-6	4.56	0.99	.47	.87
41	Respect	Context	1-6	4.10	1.29	.62	.87
	N of items = 20						
	Alpha = .88						
4	Society's image	World	1-6	2.51	1.31	.35	.55
24	Salary	World	1-6	3.84	1.32	.31	.56
38	Labor market	World	1-6	3.98	1.24	.17	.63
40	Job is secure	World	1-6	4.29	1.04	.59	.41
42	Impacts lives	World	2-6	4.98	0.86	.37	.53
	N of items = 5						
	Alpha = .60						

TABLE 9

Illinois Registered Nurses Employment Status, Setting, and Position

## Status

Employed in Nursing	83.6%
Employed outside Nursing	3.4%
Employed both in and outside Nursing	4.1%
Unemployed*	8.9%

## Setting

Hospital	53.9%
Ambulatory Care	12.9%
Nursing Home	7.3%
Home Care	7.2%

## Position

Staff RN, Charge RN, or Team Leader	52.5%
Advanced Practice	5.8%
Nursing Management/Administration	11.1%
Home Care	5.3%
Instructor/Faculty	3.1%
Other	22.1%

\*retired, seeking employment, temporarily out of the job market

Note. From Marcantonio, R.J., Young, W.B., & Howard, M.J. (1997). 1996 Biennial survey of Illinois registered nurses: Final report. Chicago: University of Illinois, College of Nursing.

TABLE 10

Respondent Demographic Data

Gender	<u>Frequency</u>	<u>% of Respondents</u>
Female	319	93.5
Male	19	5.5
<u>Missing</u>	3	1.0
Totals	341	100.0

## Age in Years

30 or younger	50	12.3
31-45	135	39.1
46-65	154	43.1
Over 65	2	.5
<u>Missing</u>	20	5.0
Totals	341	100.0

## Marital Status

Married	214	63.5
Married, Not first marriage	39	11.5
Widowed	7	2.0
Divorced	50	14.8
Separated	4	1.0
Never Married	23	6.2
<u>Missing</u>	4	1.0
Totals	341	100.0

## Number of Dependent Children Living at Home

0-2 years of age		
None	299	87.7
One	37	10.9
Two	5	1.4
<u>Missing</u>	0	0
Totals	341	100.0

TABLE 10 (continued)

## Number of Dependent Children Living at Home

	<u>Frequency</u>	<u>% of Respondents</u>
3-4 years of age		
None	315	92.2
One	23	7.0
Two	3	.8
<u>Missing</u>	0	0
Totals	341	100.0
5 years of age		
None	316	92.3
One	25	7.3
<u>Missing</u>	0	0
Total	341	100.0
6-12 years of age		
None	248	72.3
One	55	16.1
Two	31	9.0
Three	6	1.7
Four or more	1	.2
<u>Missing</u>	0	0
Totals	341	100.0
13-18 years of age		
None	250	73.3
One	59	17.3
Two	27	7.9
Three	4	1.1
Four or more	1	.2
<u>Missing</u>	0	0
Totals	341	100.0
Over 18 years of age		
None	276	80.9
One	42	12.3
Two	18	5.2
Three	5	1.4
<u>Missing</u>	0	0
Totals	341	100.0

TABLE 10 (continued)

Racial/Ethnic Background	<u>Frequency</u>	<u>% of Respondents</u>
African-American	19	5.6
American Indian or Alaskan Native	2	.5
Asian	39	11.5
Mexican-American	4	1.1
Pacific Islander	2	.5
Puerto Rican	0	0
Other Hispanic	1	.3
White non-Hispanic	269	79.5
Other	2	.5
<u>Missing</u>	<u>3</u>	<u>.5</u>
Totals	341	100.0
Nursing Education		
Diploma	80	23.3
Associate Degree	118	34.8
Baccalaureate Degree	128	37.7
Master's Degree	11	3.2
Doctorate	2	.5
<u>Missing</u>	<u>2</u>	<u>.5</u>
Totals	341	100.0
Time Worked		
Full time	221	65.1
Part time	118	34.4
<u>Missing</u>	<u>2</u>	<u>.5</u>
Totals	341	100.0

TABLE 10 (continued)

## Nursing Position

Staff Nurse	264	77.5
Charge Nurse	51	15.0
Team Leader	25	7.3
<u>Missing</u>	<u>1</u>	<u>.2</u>
Totals	341	100.0

Unit Worked	<u>Frequency</u>	<u>% of Respondents</u>
Critical Care	61	18.8
Emergency Room	25	7.4
Geriatrics	5	1.3
Long-term Care	17	6.9
Medical-Surgical	63	19.5
Obstetrics	33	8.6
Operating Room/ Recovery Room	28	7.6
Orthopedics	9	2.2
Outpatient Clinic/Surgery	25	7.2
Pediatrics	12	2.4
Psychiatry	15	4.3
Sub-acute Care	4	1.1
Telemetry	13	3.5
Other	31	9.2
<u>Missing</u>	<u>1</u>	<u>0</u>
Totals	341	100.0

TABLE 11

Data Describing Respondents Not Eligible to Participate

<u>Work Setting</u>	<u>Frequency</u>	<u>% of Respondents</u>
Ambulatory/Clinic/HMO/ MD Office/Urgent Care	83	21.7
Long-term/Sub-acute	32	8.3
Home Care/Hospice	37	9.6
Public Health/Government Agency/Social Service	29	7.7
School of Nursing	24	6.4
Occupational Health/Factory	6	1.8
Behavioral Health/Chemical Dependency	1	.0
School District	19	5.2
Hospital	49	12.8
Case Management/Insurance Company	5	1.4
Clinical Research/ Pharmaceuticals	6	1.8
Self-employed	25	6.6
Not Applicable	56	14.7
<u>Missing</u>	10	2.0
Totals	382	100.0%

<u>Position</u>	<u>Frequency</u>	<u>% of Respondents</u>
Staff RN	84	21.9
School Nurse	14	3.8
Advanced Practice Nurse	45	11.0
Nurse Manager/Executive	66	17.9
Faculty/Administrator	18	3.9
Case Manager/Quality Assurance/Utilization Review/Risk Management	28	6.6
Staff Development	11	2.9
Consultant	11	2.9
Retired	39	11.6
Currently not working	17	4.9
Miscellaneous	32	8.3
<u>Missing</u>	17	4.3
Totals	382	100.0%

Means, Standard Deviations, and Correlation Matrix

Item	M	SD	5	10	12	20	25	27	36	1	2	3	6	11	16	17	18	23	42	7	8	9	13	14
5	3.90	1.25	1.00	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
10	4.67	1.34	.098	1.00	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
12	2.85	1.34	.385	-.008	1.00	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
29	2.77	1.79	.192	-.019	.150	1.00	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
25	3.83	1.41	.260	.097	.250	.076	1.00	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
27	3.82	1.42	-.010	.463	-.068	-.047	.036	1.00	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
36	4.35	1.43	-.098	.556	-.041	-.090	.101	.574	1.00	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1	3.65	1.39	.165	-.004	.261	.123	.058	.095	.029	1.00	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2	3.98	1.32	.308	.017	.413	.182	.259	.087	-.010	.419	1.00	.	.	.	.	.	.	.	.	.	.	.	.	.
3	4.15	1.44	-.097	.060	-.231	-.192	-.043	.049	.055	-.156	-.241	1.00	.	.	.	.	.	.	.	.	.	.	.	.
6	4.03	1.30	.337	-.007	.340	.169	.286	-.059	-.028	.250	.376	-.065	1.00	.	.	.	.	.	.	.	.	.	.	.
11	4.83	1.20	-.205	.238	-.202	-.285	-.088	.186	.195	-.197	-.262	.325	-.265	1.00	.	.	.	.	.	.	.	.	.	.
16	4.56	1.30	-.193	-.006	-.158	-.203	-.066	-.002	.048	-.142	-.156	.266	-.149	.375	1.00	.	.	.	.	.	.	.	.	.
17	3.20	1.35	.348	-.019	.421	.157	.194	.009	-.033	.382	.485	-.458	.274	-.272	-.249	1.00	.	.	.	.	.	.	.	.
18	2.96	1.51	.189	.008	.347	.140	.320	-.440	.045	.333	.309	-.340	.176	-.245	-.155	.525	1.00	.	.	.	.	.	.	.
23	4.31	1.18	.295	.136	.358	.144	.209	.131	.062	.350	.484	-.266	.333	-.158	-.217	.543	.378	1.00	.	.	.	.	.	.
42	3.65	1.34	.178	.031	.223	.187	.109	.104	.089	.736	.309	-.070	.288	-.161	-.051	.326	.269	.357	1.00	.	.	.	.	.
7	4.26	1.45	.239	.135	.266	.099	.266	.095	.125	.269	.411	-.126	.464	-.118	-.010	.264	.244	.270	.183	1.00	.	.	.	.
8	4.08	1.34	.234	.003	.354	.185	.195	-.012	-.007	.359	.407	-.144	.374	-.257	-.149	.388	.307	.426	.306	.417	1.00	.	.	.
9	3.74	1.42	.260	.097	.245	.114	.273	.083	.100	.367	.383	-.211	.332	-.132	-.107	.361	.336	.344	.289	.669	.464	1.00	.	.
13	4.76	1.12	.046	.275	.053	-.061	.020	.190	.198	.157	.175	.032	.140	.178	.094	.072	.160	.186	.173	.249	.117	.195	1.00	.
14	3.30	1.43	.164	.041	.304	.093	.290	.107	.079	.249	.416	-.086	.315	-.107	.003	.253	.260	.257	.257	.335	.330	.342	.198	1.00
15	4.22	1.28	.164	.134	.253	.059	.296	.095	.145	.445	.359	-.244	.285	-.124	-.073	.353	.414	.367	.401	.369	.304	.421	.365	.394
19	4.19	1.31	.283	.099	.257	.108	.340	.055	.116	.366	.511	-.119	.446	-.189	-.006	.350	.307	.434	.371	.456	.361	.382	.344	.421
21	4.61	1.07	.099	.161	.112	-.083	.188	.074	.141	.122	.117	-.104	.237	.129	.105	.034	.112	.245	.126	.240	.234	.209	.166	.210
22	4.19	1.33	.175	.071	.189	.006	.331	.090	.117	.217	.334	-.148	.377	-.101	-.055	.237	.228	.335	.199	.632	.369	.617	.210	.358
26	3.43	1.46	.179	.010	.292	.127	.268	.042	.010	.294	.409	-.078	.412	-.121	-.024	.297	.248	.350	.319	.617	.433	.567	.152	.355
28	3.95	1.39	.280	.096	.201	.070	.330	.078	.080	.293	.302	-.145	.400	-.130	-.076	.307	.343	.413	.341	.259	.197	.264	.162	.225
29	5.39	0.96	-.082	.159	-.121	-.201	-.032	.214	.136	.006	.034	.049	-.021	.239	.105	-.061	.029	.093	.022	.026	-.052	-.082	.117	.047
30	4.60	1.31	-.075	.308	-.092	-.221	.033	.397	.401	-.146	-.018	.136	-.097	.217	.127	-.094	-.052	-.053	-.127	-.001	-.084	-.011	.161	.062
31	3.71	1.54	.273	.078	.251	.180	.307	.128	.061	.243	.407	-.084	.339	-.145	-.125	.280	.266	.297	.257	.387	.392	.449	.118	.538
2	4.62	1.06	.246	.161	.201	.054	.251	.136	.113	.310	.267	-.075	.409	-.053	-.131	.250	.205	.412	.392	.285	.278	.227	.153	.256
33	3.81	1.51	.231	.066	.280	.052	.290	.036	.054	.290	.476	-.084	.425	-.139	-.086	.316	.231	.339	.269	.659	.369	.586	.186	.397

Item	M	SD	5	10	12	20	25	27	36	1	2	3	6	11	16	17	18	23	42	7	8	9	13	14
34	3.86	1.24	.277	.040	.235	.117	.316	.089	.068	.252	.394	-.079	.370	-.140	-.149	.294	.273	.328	.275	.408	.348	.364	.251	.429
35	3.56	1.44	.248	.078	.217	.102	.217	.014	.045	.252	.240	-.053	.145	-.156	-.081	.221	.234	.341	.306	.128	.302	.246	.128	.285
38	3.87	1.42	.158	.045	.247	.120	.223	.006	.103	.219	.304	-.215	.193	-.112	-.089	.029	.258	.329	.223	.268	.267	.244	.121	.237
40	2.87	1.43	.271	.058	.321	.088	.257	-.022	.051	.326	.037	-.092	.320	-.256	-.191	.362	.335	.314	.325	.349	.391	.405	.048	.397
4	2.66	1.25	.311	.054	.258	.144	.189	.139	.053	.264	.204	-.006	.167	-.182	-.181	.223	.205	.195	.298	.153	.209	.295	.066	.294
24	3.10	1.51	.284	-.008	.217	.071	.449	.057	.002	.215	.381	-.235	.224	-.174	-.097	.389	.378	.325	.194	.193	.296	.256	.071	.381
37	3.77	1.48	.043	-.097	.093	.067	.079	-.078	-.022	.040	.024	.004	.000	-.030	-.007	.055	.136	.084	.014	-.029	.074	-.021	-.026	.105
39	3.85	1.44	.177	.022	.214	.092	.208	.018	-.048	.149	.257	-.053	.209	-.157	-.167	.221	.135	.280	.188	.186	.290	.243	.078	.231
41	5.29	0.94	.021	.070	.144	-.110	.276	.109	.228	.028	.143	-.047	.148	.066	.027	.088	.035	.265	.096	.043	.198	.121	.047	.110

Item	M	SD	15	19	21	22	26	28	29	30	31	32	33	34	35	38	40	4	24	37	39	41	
15	4.22	1.28	1.00	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
19	4.19	1.31	.503	1.00	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
21	4.61	1.07	.264	.290	1.00	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
22	4.19	1.33	.441	.394	.291	1.00	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
26	3.43	1.46	.355	.449	.301	.574	1.00	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
28	3.95	1.39	.348	.418	.230	.308	.377	1.00	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
29	5.39	0.96	.108	.156	.114	.108	-.024	.030	1.00	.	.	.	.	.	.	.	.	.	.	.	.	.	.
30	4.60	1.31	.040	-.054	.077	.009	-.084	.028	.275	1.00	.	.	.	.	.	.	.	.	.	.	.	.	.
31	3.71	1.54	.340	.386	.186	.398	.414	.296	.081	.080	1.00	.	.	.	.	.	.	.	.	.	.	.	.
32	4.62	1.06	.281	.398	.384	.306	.311	.698	.116	.031	.319	1.00	.	.	.	.	.	.	.	.	.	.	.
33	3.81	1.51	.345	.449	.245	.664	.594	.361	.026	-.047	.469	.368	1.00	.	.	.	.	.	.	.	.	.	.
34	3.86	1.24	.337	.385	.227	.428	.327	.287	.185	.072	.453	.365	.472	1.00	.	.	.	.	.	.	.	.	.
35	3.56	1.44	.239	.321	.118	.182	.134	.216	.140	-.030	.341	.276	.190	.386	1.00	.	.	.	.	.	.	.	.
38	3.87	1.42	.120	.365	.237	.224	.276	.289	.006	.023	.253	.268	.263	.282	.291	1.00	.	.	.	.	.	.	.
40	2.87	1.43	.304	.350	.207	.345	.434	.311	-.108	-.001	.372	.289	.393	.342	.265	.295	1.00	.	.	.	.	.	.
4	2.66	1.25	.169	.182	-.041	.189	.184	.181	-.144	.045	.311	.133	.198	.284	.192	.095	.369	1.00	.	.	.	.	.
24	3.10	1.51	.330	.293	.142	.318	.254	.315	.059	.011	.304	.157	.239	.362	.192	.211	.323	.185	1.00	.	.	.	.
37	3.77	1.48	.049	.095	-.008	.020	-.043	-.033	.107	-.014	.058	.000	-.099	.075	.048	.120	.123	-.005	.047	1.00	.	.	.
39	3.85	1.44	.269	.290	.163	.146	.205	.172	.085	.015	.237	.185	.154	.291	.217	.381	.143	.078	.164	.289	1.00	.	.
41	5.29	0.94	.162	.190	.263	.199	.090	.151	.165	.098	.136	.274	.128	.207	.108	.202	.086	-.006	.120	.178	.154	1.00	.

TABLE 12 (continued)

TABLE 13

Chi-Square, Goodness of Fit, and Parsimony Ratios for the Three Models  
(n =265)

Statistic	Four Factor Model	Three Factor Model	One Factor Model
Variables	42	42	42
N	265	265	265
Model Chi-square	3220.70	3194.98	3135.13
Model df	819	819	819
Significance	p<.0001	p<.0001	P<.0001
Chi-square/df	3.93	3.90	3.84
Comparative Fit Index (CFI)	0.48	0.49	0.50
Goodness of Fit Index (GFI)	0.63	0.66	0.64
Adjusted Goodness of Fit (AGFI)	0.60	0.60	0.60
Parsimonious GFI	0.60	0.60	0.60
Parsimonious Normed Fit Index (NFI)	0.39	0.40	0.41
Root Mean Square Residual (RMSR)	0.32	0.25	0.16
Root Mean Square Error of Approximation (RMSEA)	0.10	0.10	0.10

TABLE 14

Parameter Estimates for the Four Factor Measurement Model (n= 265)

Variable	Pattern Coefficients	Z	Indicator Reliability	Error Variance
Factor 1				
Home life				
v5 balance	.05	.68*	.00	1.00
v10 onsitecc	.66	10.53	.44	.56
v12 energy	.05	.78*	.00	1.00
v20 rotate	.86	1.25*	.01	.99
v25 FMLA	.10	.49*	.01	.99
v27 eldercare	.68	10.87	.47	.53
v36 illcc	.84	13.27	.71	.29
n=7				
Alpha = .53				
Factor 2				
Work Design				
v1 amtUAP	.61	10.10	.37	.63
v2 jobsat	.65	10.85	.42	.58
v3 workload	.44	6.96	.20	.80
v6 autonomy	.43	6.78	.19	.81
v11 nonnsg	.39	6.05	.15	.85
v16 routine	.31	4.80	.10	.90
v17 havetime	.76	13.34	.57	.43
v 8 noRNs	.58	9.55	.34	.66
v23 qualcare	.67	11.39	.45	.55
v42 qualUAP	.54	8.84	.30	.70
n=10				
Alpha = .57				

TABLE 14 (continued)

Variable	Pattern Coefficients	Z	Indicator Reliability	Error Variance
Factor 3				
Work Context				
v7	.75	14.06	.57	.43
commmgr				
v8 supplies	.56	9.61	.32	.68
v9 suprmgr	.73	13.50	.54	.46
v13 frndshp	.30	4.86	.09	.90
v14 carradvn	.56	9.50	.31	.69
v15	.56	9.59	.32	.68
teamwork				
v19 workfam	.64	11.27	.41	.59
v21 thrpsts	.38	6.21	.15	.85
v22 feedback	.75	13.83	.56	.44
v26 decnprt	.73	13.33	.53	.47
v28 repctMD	.49	8.21	.24	.76
v29 pvtarea	.07	1.07*	.00	.99
v30 bsndeg	.00	0.02*	.00	.99
v31 insxce	.62	10.69	.38	.62
v32 comMD	.50	8.34	.25	.75
v33 recgntn	.77	14.56	.60	.40
v34 pandp	.59	10.28	.35	.64
v35 security	.36	5.77	.13	.87
v38 safety	.40	6.52	.16	.84
v40 mgmtres	.55	9.33	.30	.70
n = 20				
Alpha = .87				
Factor 4				
Work World				
v4 society	.12	1.37*	.01	.98
v24 salary	.26	2.92	.07	.93
v37 jobmrkt	.45	4.43	.21	.79
v39 jbsecure	.61	4.96	.37	.63
v41 impact	.30	3.39	.09	.91
n = 5				
Alpha = .37				

All z-tests are significant at  $p \leq .05$  except those marked\*

TABLE 15

Item Summary Statistics by Quality of Nursing Work Life Dimension (n=265)

Item #	Item Description	Dimension	Range	M	SD	Corrected Item-to-Total r	Alpha if Item Deleted
5	Balance	Worklife	1-6	3.90	1.25	.26	.50
10	Child care	Worklife	1-6	4.67	1.34	.39	.44
12	Energy left	Worklife	1-6	2.85	1.34	.21	.51
20	Rotateschedules	Worklife	1-6	2.77	1.79	.08	.56
25	FMLA policy	Worklife	1-6	3.83	1.41	.27	.49
27	Elder day care	Worklife	1-6	3.82	1.42	.30	.48
36	Ill child care	Worklife	1-6	4.35	1.43	.33	.47
N of items = 7							
Alpha =.53							
1	Enough UAPs	Design	1-6	3.65	1.39	.52	.40
2	Satisfied with job	Design	1-6	3.98	1.32	.46	.41
3	Workload too heavy	Design	1-6	4.15	1.44	.28	.63
6	Autonomy	Design	1-6	4.03	1.30	.31	.46
11	Non-nursing tasks	Design	1-6	4.83	1.20	.18	.60
16	Interruptions	Design	1-6	4.56	1.30	.13	.59
17	Enough time	Design	1-6	3.20	1.35	.42	.43
18	Enough RNs	Design	1-6	2.96	1.51	.33	.46
23	Good quality care	Design	1-6	4.31	1.18	.46	.41
42	Quality UAPs	Design	1-6	3.65	1.34	.51	.40
N of items = 10							
Alpha =.52							
7	Communication	Context	1-6	4.26	1.45	.62	.86
8	Adequate supplies	Context	1-6	4.08	1.34	.47	.87
9	Supervision	Context	1-6	3.74	1.42	.61	.87
13	Friendships	Context	1-6	4.76	1.12	.31	.87
14	Advancement	Context	1-6	3.30	1.43	.53	.87
15	Teamwork	Context	1-6	4.22	1.28	.55	.87
19	Belong Work Family	Context	1-6	4.19	1.31	.62	.86
21	Communication	Context	1-6	4.61	1.07	.38	.87
22	Feedback	Context	1-6	4.19	1.33	.63	.86
26	Participate	Context	1-6	3.43	1.46	.60	.87
28	Respect from MDs	Context	1-6	3.95	1.39	.50	.87
29	Nurses' area	Context	1-6	5.39	0.96	.10	.88

TABLE 15 (continued)

Item #	Item Description	Dimension	Range	M	SD	Corrected Item-to-Total r	Alpha if Item Deleted
31	In-service/CE	Context	1-6	3.71	1.54	.57	.87
32	Communicate MDs	Context	1-6	4.62	1.06	.51	.87
33	Recognition	Context	1-6	3.81	1.51	.64	.86
34	Policy/Procedures	Context	1-6	3.86	1.24	.58	.87
35	Security depart.	Context	1-6	3.56	1.44	.40	.87
38	Safety	Context	1-6	3.87	1.42	.43	.87
40	Respect	Context	1-6	2.87	1.43	.50	.87
	N of items = 20						
	Alpha = .87						
4	Society's image	World	1-6	2.66	1.25	.08	.40
24	Salary	World	1-6	3.10	1.51	.21	.30
37	Labor market	World	1-6	3.77	1.48	.20	.31
39	Job is secure	World	1-6	3.85	1.44	.28	.25
41	Impacts lives	World	1-6	5.29	.94	.16	.34
	N of items = 5						
	Alpha = .37						

TABLE 16

Chi-Square, Goodness of Fit, and Parsimony Ratios for the Revised Four Factor Model

Statistic	Four Factor Model
Variables	42
N	265
Model Chi-square	3050.23
Model df	819
Significance	p<.0001
Chi-square/df	3.72
Comparative Fit Index (CFI)	0.52
Goodness of Fit Index (GFI)	0.67
Adjusted Goodness of Fit (AGFI)	0.64
Parsimonious GFI	0.64
Parsimonious NFI	0.43
Root Mean Square Residual (RMSR)	0.31
Root Mean Square Error of Approximation (RMSEA)	0.10

Note. The four factor model was revised as follows: item 5 was moved to factor 3, item 12 was moved to factor 2, and item 25 was moved to factor 4.

TABLE 17

Parameter Estimates for the Revised Four Factor Model

Variable	Pattern Coefficients	Z	Indicator Reliability	Error Variance
Factor 1				
Home life				
V10 onsitecc	.67	10.61	.45	.55
V20 rotate	.08	1.20*	.00	.99
V27 eldercare	.69	10.95	.48	.53
V36 illcc	.83	13.12	.69	.31
n=4				
Alpha = .56				
Factor 2				
Work Design				
V1 amtUAP	.59	9.81	.35	.65
V2 jobsat	.66	11.18	.43	.56
V3 workload	.44	7.02	.20	.80
V6 autonomy	.45	7.10	.20	.78
V11 nonnsg	.39	6.08	.15	.85
V12 energy	.55	8.97	.30	.70
V16 routine	.31	4.82	.10	.90
V17 havetime	.76	13.57	.58	.42
V18 noRNs	.59	9.71	.35	.65
V23 qualcare	.67	11.48	.45	.55
V42 qualUAP	.53	8.54	.28	.72
n=11				
Alpha = .58				

TABLE 17 (continued)

Variable	Pattern Coefficients	z	Indicator Reliability	Error Variance
Factor 3				
Work Context				
V5 balance	.35	5.62	.12	.88
v7 commmgr	.75	14.00	.56	.44
v8 supplies	.56	9.65	.31	.69
v9 suprmgr	.73	13.48	.54	.47
v13 frndshp	.30	4.83	.09	.91
v14 carradvn	.56	9.51	.31	.69
v15 teamwork	.56	9.58	.31	.69
v19 workfam	.64	11.35	.41	.59
v21 thrpsts	.38	6.19	.15	.85
v22 feedback	.74	13.71	.55	.45
v26 decnprt	.72	13.24	.52	.48
v28 repctMD	.50	8.31	.25	.75
v29 pvtarea	.06	1.02*	.00	.99
v30 bsndeg	.00	.00*	.00	1.00
v31 insxce	.62	10.76	.38	.61
v32 commMD	.50	8.42	.25	.75
v33 recgntn	.77	14.49	.59	.40
v34 pandp	.60	10.36	.36	.64
v35 security	.36	5.88	.13	.87
v38 safety	.40	6.55	.16	.84
v40 mgmntres	.55	9.41	.30	.70
n = 21				
Alpha = .88				
Factor 4				
Work World				
v4 society	.24	3.32	.06	.94
v24 salary	.56	7.14	.32	.69
V25 FMLA	.78	8.66	.61	.39
v37 jobmrkt	.15	2.11	.02	.98
v39 jbsecure	.30	4.12	.09	.91
v41 impact	.33	4.48	.11	.89
n = 6				
Alpha = .49				

All z-tests are significant at  $p \leq .05$  except those marked\*

TABLE 18

Item Summary and Internal Reliability Results for the Revised Four Factor Model

Item #	Item Description	Dimension	Range	M	SD	Corrected Item-to-Total r	Alpha if Item Deleted
10	Child care	Worklife	1-6	4.67	1.34	.50	.36
20	Rotate schedules	Worklife	1-6	2.77	1.79	.04	.77
27	Elder day care	Worklife	1-6	3.82	1.42	.49	.37
36	Ill child care	Worklife	1-6	4.35	1.43	.55	.31
	N of items = 4 Alpha = .56						
1	Enough UAPs	Design	1-6	3.65	1.39	.53	.49
2	Satisfied with job	Design	1-6	3.98	1.32	.52	.49
3	Heavy workload	Design	1-6	4.15	1.44	.31	.68
6	Autonomy	Design	1-6	4.03	1.30	.35	.54
11	Non-nursing tasks	Design	1-6	4.83	1.20	.20	.66
12	Energy left	Design	1-6	2.85	1.34	.41	.52
16	Interruptions	Design	1-6	4.56	1.30	.16	.65
17	Enough time	Design	1-6	3.20	1.35	.48	.50
18	Enough RNs	Design	1-6	2.96	1.51	.38	.53
23	Good quality care	Design	1-6	4.31	1.18	.51	.50
42	Quality UAPs	Design	1-6	3.65	1.34	.50	.50
	N of items = 11 Alpha = .58						
5	Balance	Context	1-6	3.90	1.25	.34	.88
7	Communication	Context	1-6	4.26	1.45	.62	.87
8	Adequate supplies	Context	1-6	4.08	1.34	.50	.87
9	Supervision	Context	1-6	3.74	1.42	.61	.87
13	Friendships	Context	1-6	4.76	1.12	.30	.88
14	Advancement	Context	1-6	3.30	1.43	.54	.87
15	Teamwork	Context	1-6	4.22	1.28	.55	.87
19	Work Family	Context	1-6	4.19	1.31	.63	.87
21	Communication	Context	1-6	4.61	1.07	.38	.88
22	Feedback	Context	1-6	4.19	1.33	.63	.87
26	Participate	Context	1-6	3.43	1.46	.59	.87
28	Respect from MDs	Context	1-6	3.95	1.39	.51	.87
29	Nurses' area	Context	1-6	5.39	0.96	.09	.89

TABLE 18 (continued)

Item #	Item Description	Dimension	Range	M	SD	Corrected Item-to-Total r	Alpha if Item Deleted
30	Degree completion	Context	1-6	4.60	1.31	.04	.89
31	In-service/CE	Context	1-6	3.71	1.54	.57	.87
32	Communicate MDs	Context	1-6	4.62	1.06	.52	.87
33	Recognition	Context	1-6	3.81	1.51	.64	.87
34	Policy/Procedures	Context	1-6	3.86	1.24	.59	.87
35	Security depart.	Context	1-6	3.56	1.44	.42	.88
38	Safety	Context	1-6	3.87	1.42	.44	.88
40	Respect	Context	1-6	2.87	1.43	.51	.87
	N of items = 21 Alpha = .88						
4	Society's image	World	1-6	2.66	1.25	.12	.51
24	Salary	World	1-6	3.10	1.51	.33	.40
25	FMLA policy	World	1-6	3.83	1.41	.39	.37
37	Labor market	World	1-6	3.77	1.48	.17	.49
39	Job is secure	World	1-6	3.85	1.44	.29	.43
41	Impacts lives	World	1-6	5.29	.94	.21	.47
	N of items = 6 Alpha = .49						

TABLE 19

Eigenvalues Obtained From Parallel Analysis

---

Real Data Matrix	Random Data Matrix
9.96	1.92
2.73	1.84
1.60	1.81
1.20	1.74
1.14	1.62
0.97	1.61
0.92	1.57
0.69	1.53
0.56	1.47
0.53	1.44
0.45	1.38
0.38	1.32

---

Table 20

Exploratory Factor Analysis Results—Oblique Rotation

Variable	Factor I	Factor II
v5 balance	<u>.439</u>	.181
v10 onsitecc	.108	<u>.552</u>
v12 energy	<u>.499</u>	.232
v20 rotate	.214	<u>.320</u>
v25 FMLA	<u>.459</u>	.061
v27 eldercare	.092	<u>.560</u>
v36 ilcc	.090	<u>.630</u>
v1 amtUAP	<u>.549</u>	.127
v2 jobsat	<u>.661</u>	.110
v3 workload	.291	<u>.303</u>
v6 autonmy	<u>.577</u>	.077
v11 nonnsg	<u>.306</u>	<u>.532</u>
v16 routine	.215	<u>.311</u>
v17 havetime	<u>.600</u>	.290
v 18 noRNs	<u>.529</u>	.177
v23 qualcare	<u>.631</u>	.026
v42 qualUAP	<u>.532</u>	.058
v7 commgr	<u>.641</u>	.145
v8 supplies	<u>.608</u>	.118
v9 suprmgr	<u>.670</u>	.044
v13 frndshp	.266	<u>.353</u>
v14 carradvn	<u>.569</u>	.079
v15 teamwrk	<u>.612</u>	.117
v19 workfam	<u>.677</u>	.078
v21 thrpsts	<u>.344</u>	.290
v22 feedback	<u>.631</u>	.186
v26 decnprt	<u>.648</u>	.055
v28 repctMD	<u>.567</u>	.086
v29 pvtarea	.023	<u>.394</u>
v30 bsndeg	.046	<u>.528</u>
v31 insxce	<u>.608</u>	.063
v32 commMD	<u>.550</u>	.184
v33 recgntn	<u>.675</u>	.093
v34 pandp	<u>.610</u>	.096
v35 security	<u>.429</u>	.007
v38 safety	<u>.467</u>	.004
v40 mgmtres	<u>.604</u>	.106
v4 society	<u>.377</u>	.086
v24 salary	<u>.500</u>	.072
v37 jobmrkt	.081	.071
v39 jbsecure	<u>.402</u>	.052
v41 impact	.240	.239

TABLE 21

Exploratory Factor Analysis Results—Orthogonal Rotation

Variable	Factor I	Factor II
v5 balance	<u>.432</u>	.183
v10 onsitecc	.129	<u>.551</u>
v12 energy	<u>.490</u>	.234
v20 rotate	.202	<u>.321</u>
v25 FMLA	<u>.461</u>	.059
v27 eldercare	.114	<u>.559</u>
v36 ilcc	.114	<u>.629</u>
v1 amtUAP	<u>.544</u>	.129
v2 jobsat	<u>.657</u>	.114
v3 workload	.279	<u>.304</u>
v6 autonomy	<u>.574</u>	.080
v11 nonnsg	.285	<u>.533</u>
v16 routine	.203	<u>.312</u>
v17 havetime	<u>.589</u>	.293
v 18 noRNs	<u>.522</u>	.180
v23 qualcare	<u>.630</u>	.029
v42 qualUAP	<u>.530</u>	.061
v7 commmgr	<u>.646</u>	.142
v8 supplies	<u>.603</u>	.121
v9 suprmgr	<u>.672</u>	.040
v13 frndshp	.279	<u>.351</u>
v14 carradvn	<u>.572</u>	.076
v15 teamwork	<u>.617</u>	.114
v19 workfam	<u>.680</u>	.075
v21 thrpsts	<u>.355</u>	.288
v22 feedback	<u>.638</u>	.182
v26 decnprt	<u>.650</u>	.051
v28 repctMD	<u>.570</u>	.083
v29 pvtarea	.038	<u>.394</u>
v30 bsndeg	.026	<u>.528</u>
v31 insxce	<u>.611</u>	.060
v32 commMD	<u>.577</u>	.181
v33 recgntn	<u>.678</u>	.090
v34 pandp	<u>.614</u>	.092
v35 security	<u>.429</u>	.009
v38 safety	<u>.467</u>	.001
v40 mgmntres	<u>.600</u>	.109
v4 society	<u>.374</u>	.088
v24 salary	<u>.498</u>	.075
v37 jobmrkt	.078	.072
v39 jbsecure	<u>.400</u>	.054
v41 impact	<u>.249</u>	.238

TABLE 22

Total Scale Scores and Sub-scale Scores for the Quality of Nursing Work Life Survey (n=330)

Scale	Possible Score Range	Actual Range	Mean	Standard Deviation
42-item scale	42-252	79-226	164.00	24.19
7-item Work life/Home Life Subscale	7-42	9-40	25.71	5.25
10-item Work Design Subscale	10-60	19-54	39.00	6.00
20-item Work Context Subscale	20-120	23-115	80.39	15.07
5-item Work World Subscale	5-30	3-30	18.40	3.81

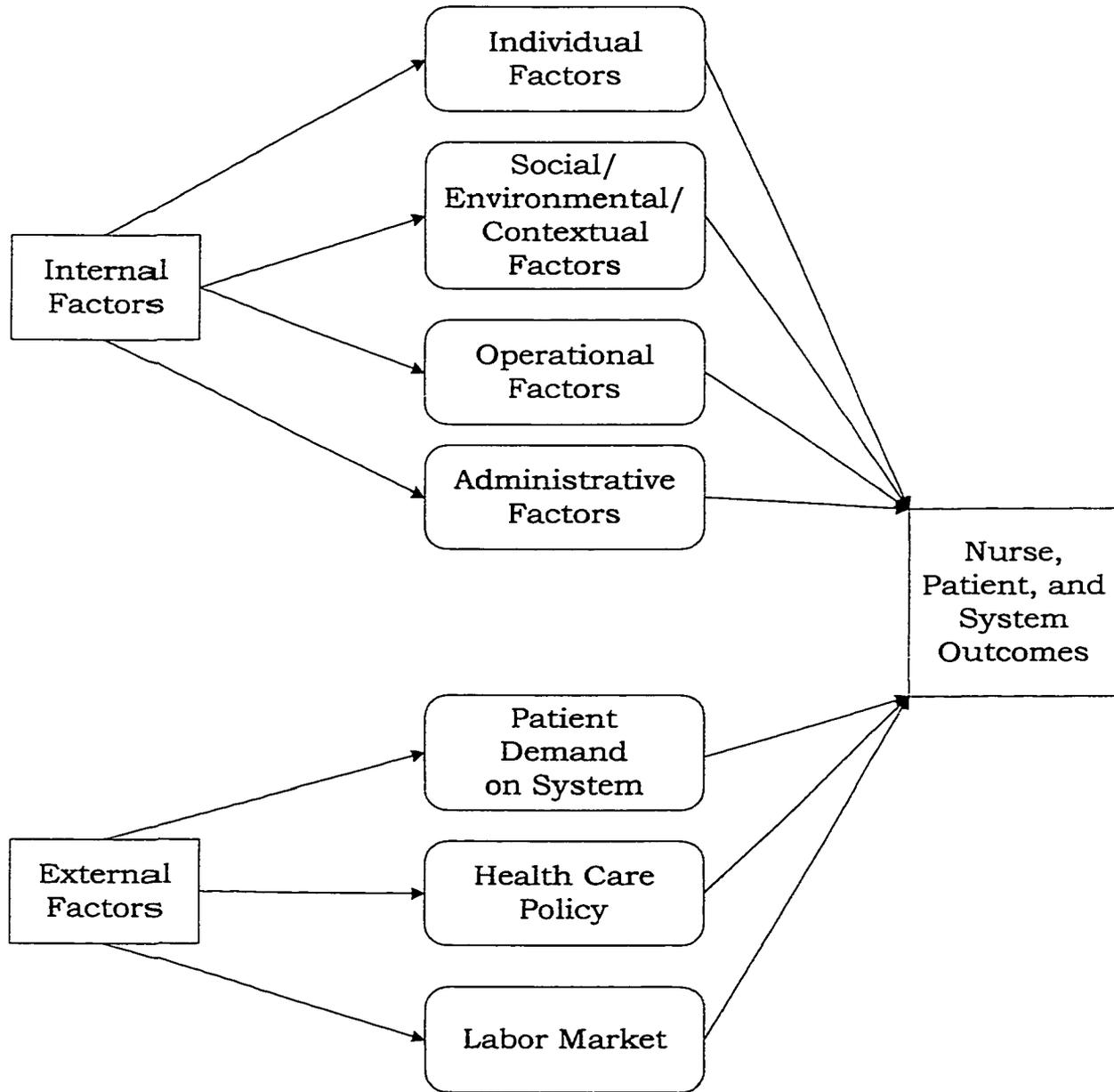
TABLE 23

Summary of Quality of Nursing Work Life Items from the Revised Model with  
Weak Empirical Support (n =265)

Factor	Variable	CVI	Dimension Agreement By Experts	Pattern Coefficient	Corrected Item to total r	Alpha with item removed
Worklife/ Homelife n= 4	20 Rotating	1.00	.67	.08*	.04	.77 Subscale Alpha .56
Work Design  n=11	11 non-nsg tasks 16 routine	1.00  1.00	1.00  1.00	.39  .31	.20  .16	.66  .65 Subscale Alpha .58
Work Context  n = 21	29 break area 30 degree programs	1.00  .85	1.00  .00	.06*  .00*	.09  .04	.89  .89 Subscale Alpha .88
Work World  n = 6	4 society's image 37 job market 39 job sec 41 impact	1.00  1.00  1.00  .85	1.00  .71  .00  .00	.24  .15  .30  .33	.12  .17  .29  .21	.51  .49  .49  .47  Subscale Alpha .49

All t-tests are significant at  $p \leq .05$  except those marked\*

Factors Influencing Quality of Nursing Worklife



Note. From "Quality of Nursing Worklife Issues--A Unifying Framework," by L.O.'Brien-Pallas and A. Baumann, 1992, Canadian Journal of Nursing Administration, 5(2), 13. Copyright 1992 by Canadian Journal of Nursing Administration. Reprinted with permission.

## APPENDICES

UNIVERSITY OF ILLINOIS  
AT CHICAGO

College of Nursing  
Department of Public Health, Mental Health,  
and Administrative Nursing

Chicago, IL

Date

Dear Expert:

I am beginning work on my dissertation research. After a thorough review of the literature I have written 71 items for possible inclusion on a questionnaire to measure quality of nursing work life. Would you participate in my research by acting as a content expert during the instrument development phase?

Enclosed is my questionnaire in a format which allows you to assess the content validity of each item. For each item you are asked to rate the clarity, accuracy, and relevance of the item. For each item, you are asked to identify the dimension (Work life/Home life, Work Design, Work Context, Work World) for each item. Attached is my conceptualization of quality of nursing work life and a description of the dimensions.

Would it be possible to have the questionnaire returned to me by May 5<sup>th</sup>? I have enclosed a self-addressed envelope for your convenience. I will be happy to provide you with a summary of my research findings when they are available. Please contact me at (xxx) xxx-xxxx if questions arise. Thank you for sharing your expertise.

Sincerely,

Beth A. Brooks, MS, RN  
Doctoral Student, College of Nursing  
University of Illinois at Chicago

Enc.

**UIC**

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The conceptualization of quality of nursing work life used for this study is adapted from Attridge and Callahan (1990) and O'Brien-Pallas, Baumann, and Villeneuve (1994). Quality of nursing work life is the degree to which registered nurses are able to satisfy important personal needs through their experiences in their work organization while achieving the organization's goals.

Dimensions of nursing work life according to O'Brien-Pallas and Baumann (1992) and O'Brien-Pallas, Baumann, and Villeneuve (1994) include:

Work life/Home life	Is defined as the interface between the life experiences of nurses in their place of work and in the home.
Word Design	Is defined as the composition of nursing work and describes the actual work nurses do.
Work Context	Is defined as the practice settings in which nurses work and explores the impact of the work environment on both nurse and patient systems.
Work World	Is defined as the effects of broad societal influences and change on the practice of nursing.

## Appendix B

Are you employed as a Staff Nurse, Charge Nurse, or Team Leader in a hospital setting?

1. YES. Please begin the survey on page 2.
2. NO. Inasmuch as our purpose is to learn more about the work of staff nurses, charge nurses, and team leaders in hospitals, you do not need to answer the attached survey. However, please answer the two questions below and return the questionnaire to us. We would also appreciate any comments you might like to make that would help us learn more about nursing worklife.

Identify your current PRINCIPAL nursing work **setting**. Circle only ONE response.

Clinic (Excluding Hospital Clinic and HMO)	Associate Degree Nursing Program
Health Maintenance Organization	Diploma Nursing Program
EmergiCenter/Acute Care Center	Baccalaureate or Higher Degree Nursing Program
Physician(s)' or Dentist(s)' Office	Self Employed/Receive Fee for Service
Nursing Home or Extended Care Facility	Nursing or Health Association
Home Care Agency	Psychiatric Hospital
Public Health or Community Health Setting	Substance Abuse/Chemical Dependency Facility
Occupational Health/Employee Health Service	Other (specify)_____
Student Health Service (School)	
Practical Nursing Program	

Identify your current PRINCIPAL nursing **position**. Circle only ONE response.

Nurse Clinician	Administrator/Associate/Assistant Professional Organization
Clinical Nurse Specialist	Faculty in Academic Nursing Program
Certified Nurse Anesthetist	Home Care Nurse
Certified Nurse Midwife	Consultant
Head Nurse or Assistant Head Nurse	Private Duty Nurse
Inservice Education Instructor	Office Nurse
Administrator/Associate/Assistant Nursing Service	School Nurse
Administrator/Associate/Assistant Academic Program	Retired
	Currently Not Working
	Other (specify)_____

This survey contains statements about nursing worklife. For your primary paid employment, please indicate how much you disagree or agree with each statement using the scale given below. If you are unsure about your answer to a given item, think about it for a minute and then respond. Please mark your answer by circling one number.

There are no right or wrong answers.

	Strongly Disagree					Strongly Agree
1. I receive a sufficient amount of assistance from unlicensed support personnel (the dietary aides, housekeeping, patient care technicians, and nursing assistants).	1	2	3	4	5	6
2. I am satisfied with my job.	1	2	3	4	5	6
3. My workload is too heavy.	1	2	3	4	5	6
4. In general, society has an accurate image of nurses.	1	2	3	4	5	6
5. I am able to balance work with my family needs.	1	2	3	4	5	6
6. I have the autonomy to make patient care decisions.	1	2	3	4	5	6
7. I am able to communicate well with my nurse manager/supervisor.	1	2	3	4	5	6
8. I have adequate patient care supplies and equipment.	1	2	3	4	5	6
9. My nurse manager/supervisor provides adequate supervision.	1	2	3	4	5	6
10. It is important for a hospital to offer employees on-site childcare services.	1	2	3	4	5	6
11. I perform many non-nursing tasks.	1	2	3	4	5	6
12. I have energy left after work.	1	2	3	4	5	6
13. Friendships with my co-workers are important to me.	1	2	3	4	5	6
14. My work setting provides career advancement opportunities.	1	2	3	4	5	6
15. There is teamwork in my work setting.	1	2	3	4	5	6
16. I experience many interruptions in my daily work routine.	1	2	3	4	5	6
17. I have enough time to do my job well.	1	2	3	4	5	6
18. There are enough RNs in my work setting.	1	2	3	4	5	6
19. I feel a sense of belonging in my workplace.	1	2	3	4	5	6
20. Rotating schedules negatively affect my life.	1	2	3	4	5	6
21. I am able to communicate with the other therapists (physical, respiratory, etc.).	1	2	3	4	5	6
22. I receive feedback on my performance from my nurse manager/supervisor.	1	2	3	4	5	6
23. I am able to provide good quality patient care.	1	2	3	4	5	6
24. My salary is adequate for my job given the current job market conditions.	1	2	3	4	5	6
25. My organization's policy for family-leave time is adequate.	1	2	3	4	5	6
26. I am able to participate in decisions made by my nurse manager/supervisor.	1	2	3	4	5	6
27. It is important for a hospital to offer employees on-site day care for elderly parents.	1	2	3	4	5	6
28. I feel respected by physicians in my work setting.	1	2	3	4	5	6
29. It is important to have a designated, private break area for the nursing staff.	1	2	3	4	5	6
30. It is important to me to have nursing degree-granting programs available at my hospital.	1	2	3	4	5	6
31. I receive support to attend inservices and continuing education programs.	1	2	3	4	5	6
32. I communicate well with the physicians in my work setting.	1	2	3	4	5	6
33. I am recognized for my accomplishments by my nurse manager/supervisor.	1	2	3	4	5	6
34. Nursing policies and procedures facilitate my work.	1	2	3	4	5	6
35. The security department provides a secure environment.	1	2	3	4	5	6
36. It is important for a hospital to offer employees on-site ill child care services.	1	2	3	4	5	6

	Strongly Disagree					Strongly Agree
37. I would be able to find my same job in another organization with about the same salary and benefits.	1	2	3	4	5	6
38. I feel safe from personal harm (physical, emotional, or verbal) at work.	1	2	3	4	5	6
39. I believe my job is secure.	1	2	3	4	5	6
40. Upper-level management has respect for nursing.	1	2	3	4	5	6
41. My work impacts the lives of patients/families.	1	2	3	4	5	6
42. I receive quality assistance from unlicensed support personnel (the dietary aides, housekeeping, patient care technicians, and nursing assistants).	1	2	3	4	5	6

For the following statements regarding your primary paid employment, please circle the number that most closely indicates how much you disagree or agree with each statement. Notice that the rating scale has expanded to 7 numbers.

	Strongly Disagree						Strongly Agree
43. The nursing staff in my work setting don't hesitate to pitch in and help one another out when things get in a rush.	1	2	3	4	5	6	7
44. There is too much paperwork required of nurses in this work setting.	1	2	3	4	5	6	7
45. Physicians in general cooperate with the nursing staff in my work setting.	1	2	3	4	5	6	7
46. New employees are not quickly made to "feel at home" on my unit.	1	2	3	4	5	6	7
47. I think I could do a better job if I didn't have so much to do all the time.	1	2	3	4	5	6	7
48. There is a good deal of teamwork and cooperation between various levels of nursing staff in my work setting.	1	2	3	4	5	6	7
49. There is a lot of teamwork between nurses and doctors in my work setting.	1	2	3	4	5	6	7
50. I am satisfied with the types of activities that I do on my job.	1	2	3	4	5	6	7
51. The nursing staff in my work setting are not as friendly and outgoing as I would like.	1	2	3	4	5	6	7
52. I have plenty of time and opportunity to discuss patient care problems with other nursing staff members.	1	2	3	4	5	6	7
53. There is a lot of "rank consciousness" in my work setting, with registered nurses seldom mingling with others of lower ranks.	1	2	3	4	5	6	7
54. I have sufficient time for direct patient care.	1	2	3	4	5	6	7
55. I wish the physicians in my work setting would show more respect for the skill and knowledge of the nursing staff.	1	2	3	4	5	6	7
56. I could deliver much better care if I had more time with each patient.	1	2	3	4	5	6	7
57. Physicians in my work setting generally understand and appreciate what the nursing staff does.	1	2	3	4	5	6	7
58. The physicians in this work setting look down too much on the nursing staff.	1	2	3	4	5	6	7

## DEMOGRAPHIC INFORMATION

Please mark only one answer for each question unless otherwise indicated.

1. What is your HIGHEST earned diploma or degree in **nursing**?

- Diploma
- Associate degree
- BSN
- Master's degree
- Doctoral degree
- Other (specify) \_\_\_\_\_

2. Are you:        Male            or            Female

3. What year were you born? \_\_\_\_\_

4. What is your marital status?

- Married (First marriage)
- Married (Not first marriage)
- Widowed
- Divorced
- Separated
- Never Married

5. Indicate the number of dependent children you have living **at home** in each of the following age ranges.

0 - 2 Years of Age	0	1	2	3	4 or More
3 - 4 Years of Age	0	1	2	3	4 or More
5 Years of Age	0	1	2	3	4 or More
6 - 12 Years of Age	0	1	2	3	4 or More
13 - 18 Years of Age	0	1	2	3	4 or More
Over 18 Years of Age	0	1	2	3	4 or More

6. What is your Racial/Ethnic Background?

- African-American
- American Indian or Alaskan Native
- Asian
- Mexican-American
- Pacific Islander
- Puerto Rican
- Other Hispanic
- White non-Hispanic
- Other (specify) \_\_\_\_\_

7. For your current PRINCIPAL nursing position, do you work:

Full-Time (Work an entire calendar year on a full-time basis.)

Part-Time (Work an entire calendar year on a part-time basis.)

8. Identify the type of unit where you currently work in your PRINCIPAL nursing position.

Critical Care

Emergency Room

Geriatrics

Home Care

Long-term Care

Medical-Surgical

Obstetrics

OR/RR

Orthopedics

Out-patient Clinic/Surgery

Pediatrics

Psychiatry

Sub-Acute Care

Telemetry

Other (specify) \_\_\_\_\_

9. Current PRINCIPAL nursing position (mark only one answer).

Staff Nurse

Charge Nurse

Team Leader

Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Your contribution to this effort is greatly appreciated. If you would like a summary of the results, include your return address on a separate piece of paper. A summary will be sent to you as soon as it is available.

UNIVERSITY OF ILLINOIS  
AT CHICAGO

College of Nursing  
Department of Public Health, Mental Health,  
and Administrative Nursing

Chicago, IL

Date

Dear Registered Nurse:

Healthcare organizations are trying different ways to reorganize the work of nurses. There is a need to find out how nurses are feeling about their work environment and their work life experiences. I am requesting your cooperation in completing the attached survey, which will take about 10 minutes of your time. This is a research project, and the purpose is to develop a questionnaire that can be used to get information directly from nurses about their experiences in the workplace. Once the workplace experiences of nurses are understood, then those areas needing improvement can be addressed. The information collected from you will only be used to develop this questionnaire.

Your name was drawn at random from all registered nurses living in Illinois. Your cooperation is voluntary, and completion of the survey indicates your willingness to become a participant in this study. The questionnaire has an identification number for mailing purposes only. Information from this survey will be reported only as group data, not as information about individuals or to anyone at your worksite. All responses will be kept confidential. No risks are associated with participating in this study.

Should you have any questions about this survey, please call me at [REDACTED]. If you have any questions pertaining to your rights as a research subject please contact the University of Illinois at Chicago Office for Protection of Research Subjects at [REDACTED]. You may receive a summary of these results by writing your name and address on a separate piece of paper and returning it to us. This research is being conducted in partial fulfillment of degree requirements at the University of Illinois College of Nursing.

Thank you so much for your participation.

Sincerely,

Beth A. Brooks, M.S., R.N.  
Doctoral Candidate

Paul A. Reichelt, Ph.D.  
Associate Professor

**UIC**

(312)996-4543 • Fax: (312)996-7725 • <http://www.nurs.uic.edu>

## Appendix D

Last week a survey on the quality of nursing work life was mailed to you.

If you have already completed and returned the survey to us, please accept my sincere thanks. If not, please complete the survey as soon as possible. We believe that your response will improve the quality and validity of the findings.

Thank you,

Beth A. Brooks, M.S., R.N.  
University of Illinois at Chicago  
College of Nursing

Appendix E  
UNIVERSITY OF ILLINOIS  
AT CHICAGO

163

College of Nursing  
Department of Public Health, Mental Health,  
and Administrative Nursing

Chicago, IL

Date

Dear Registered Nurse:

As of today, I have not received your completed questionnaire. Approximately three weeks ago I wrote to you asking for your help in completing a survey. Healthcare organizations are trying different ways to reorganize the work of nurses. There is a need to find out how nurses are feeling about their work environment and their work life experiences.

I am writing to request your cooperation in completing the attached survey, which will take about 10 minutes of your time. The purpose of this research project is to develop a questionnaire that can be used to get information directly from nurses about their experiences in the workplace. Once the workplace experiences of nurses are understood, then those areas needing improvement can be addressed. The information collected from you will only be used to develop this questionnaire.

Your name was drawn at random from all registered nurses living in Illinois. Information from this survey will be reported only as group data, not as information about individuals or to anyone at your worksite. All responses will be kept confidential. Your cooperation in voluntary, and completion of the survey indicates your willingness to become a participant in this study. No risks are associated with participating in this study.

Should you have any questions about this survey, please call me at [REDACTED] If you have any questions pertaining to your rights as a research subject please contact the University of Illinois at Chicago Office for Protection of Research Subjects at [REDACTED] You may receive a summary of these results by writing your name and address on a separate piece of paper and returning it to us. This research is being conducted in partial fulfillment of degree requirements at the University of Illinois College of Nursing.

Thank you so much for your participation.

Sincerely,

Beth A. Brooks, M.S., R.N.  
Doctoral Candidate

Paul A. Reichelt, Ph.D.  
Associate Professor

**UIC**

Office of the Vice Chancellor for Research (MC 672)  
310 Administrative Office Building  
1737 West Polk Street  
Chicago, Illinois 60612-7227

### Exemption Determination

November 17, 1999

Beth A. Brooks, M.S.  
Ph.D. Candidate, PMA Nursing  
e-Mail – [REDACTED]  
[REDACTED]

**RE: Research Protocol # H-97-352**  
**“ Development of an Instrument to Measure Quality of Nursing Worklife ”**

Dear Ms. Brooks:

Your research protocol involving human subjects was reviewed on November 15, 1999 and it was determined that it meets the criteria for exemption as defined in the U. S. Department of Health and Human Services Regulations for the Protection of Human Subjects (45 CFR 46). You may now begin your research.

The specific exemption category under 45 CFR 46.101(b) is:

(2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

You are reminded that investigators whose research involving human subjects is determined to be exempt from the federal regulations for the protection of human subjects still has responsibilities for the ethical conduct of the research under state law and UIC policy. Please be aware of the following UIC policies and responsibilities for investigators:

1. Amendments You are responsible for reporting any amendments to your research protocol that may affect the determination of the exemption and may result in your research no longer being eligible for the exemption that has been granted.

**UIC**

2. Record Keeping You are responsible for maintaining a copy of all questionnaires, survey instruments, interview questions and/or data collection instruments associated with this research protocol in your research files in the event future verification is necessary.
3. Final Report When you have completed work on your research protocol, you should submit a final report to the Office for Protection of Research Subjects (OPRS).
4. Information for Human Subjects UIC Policy requires investigators to provide information about the research protocol to subjects and obtain their permission prior to participating in the research. The information about the research protocol should be presented in the form of written description given to subjects or orally from a written script. When appropriate, the following information must be provided to all research subjects participating in exempt studies:
  - a. That the researchers are affiliated with UIC and/or WSVA.
  - b. The purpose of the research.
  - c. The extent of the subject's involvement and an explanation of the procedures to be followed.
  - d. If the information being collected will be used for any purposes other than the proposed research.
  - e. A description of the provisions that have been made to protect the privacy of subjects and the confidentiality of the research data.
  - f. Description of any risks.
  - g. Description of anticipated benefit.
  - h. That their participation is voluntary and that the subject can refuse to participate or can stop at any time.
  - i. That the researcher is available to answer any questions the subject may have and provide the name and phone number of the investigator(s).
  - j. That the UIC IRB/OPRS or WSVA patient advocate office is available regarding questions pertaining to subjects rights. Include phone numbers.

Please be sure to:

→ Use your research protocol number (listed above) on any documents or correspondence with the IRB concerning your research protocol.

We wish you the best as you conduct your research. If you have any further questions or concerns, please feel free to contact the OPRS at [REDACTED]

Sincerely,

[REDACTED]

Clyde W. Wheeler, Ph.D.  
Assistant Director  
Office for Protection of Research Subjects

cc: Paul Reichelt, Ph.D., Associate Professor, M/C 802  
Kathleen Knafl, Executive Assoc. Dean, Dir. Of Graduate  
Studies, M/C 802

mrl

## Vita

### Beth A. Brooks

#### Education

- 2001 Ph.D. Nursing Science, University of Illinois, Chicago, IL
- 1990 M.S. Nursing Administration, Northwestern University, Evanston, IL
- 1984 B.S.N. Valparaiso University, Valparaiso, IN

#### Professional Experience

Director, Patient Education, InLight Incorporated, Northbrook, IL, February 2000-September 2000.

Director of Graduate Studies, College of Nursing, Lewis University, Romeoville, IL, 1998-2000.

Director of Professional Practice and Nursing Research, Our Lady of the Resurrection Medical Center, Chicago, IL 1994-1996.

Healthcare Account Supervisor, Bentley, Barnes and Lynn Advertising, Chicago, IL, 1989-1993.

Coordinator of Nurse Recruitment, Sales and Marketing, Myerscough Medical Staffing, Inc., Chicago, IL, 1987-1989.

Unit Manager, St. Francis Hospital, Evanston, IL, 1986-1987.

Primary Nurse, Rush-Presbyterian-St. Luke's Medical Center, Chicago, IL, 1984-1986.

#### Honors, Awards, Appointments

Appointed to the Illinois Coalition for Nursing Resources convened by the Illinois Hospital and HealthSystem Association, 2000-2001.

Selected to Chair the Region 3 judging panel for the 2000-2001 Education Technology Awards for Sigma Theta Tau International.

Sigma Theta Tau International, Nursing Honor Society 2000-2001 selected to be listed in the Media Guide To Health Care Experts.

Academy of Management Journal, manuscript reviewer for the Health Care Administration Division for the Annual Academy meeting 1999-present.

EMA Creative Excellence Award for "Best of Category" Trade Advertising B/W Campaign, Our Lady of the Resurrection Medical Center Chicago, 1994.

EMA Creative Excellence Award for "Best of Category" Trade Advertising B/W Campaign, Swedish Covenant Hospital Chicago, 1991.

EMA Creative Excellence Award for "Best of Category" B/W Newspaper Campaign, Franciscan Health System of Central Ohio, 1990.

Sigma Theta Tau International, Nursing Honor Society 1990

### **Research Funding**

Sigma Theta Tau International, Alpha Lambda Chapter's, Research and Awards Committee funding for "Development of an Instrument to Measure Quality of Nurses' Work Life," \$750.

### **Grant Funding**

Department of Health and Human Services, Professional Nurse Traineeship Grant, (2000-2001, \$50,000)

Department of Health and Human Services, Professional Nurse Traineeship Grant, Project Director (1999-2000, \$550)

Funding from the Alberto Culver Foundation, 1998-1999. \$50,000 to implement MSN in case management on-line, Co-Director.

Department of Health and Human Services, Professional Nurse Traineeship Grant, Project Director (1998-1999, \$10,112)

### **Research**

Brooks, B.A. (2001). Development of an instrument to measure quality of nurses' work life. Doctoral dissertation.

Brooks, B.A. (1990). Supplemental agency nurses: What to include in an orientation program. Master's thesis.

## **Publications**

Brooks, B.A. Intelligently using the Internet for patient education. Manuscript submitted for publication.

Brooks, B.A. (2000). Nurses all but invisible in e-Healthcare. Nursing Spectrum, 13(20IL), 12.

Brooks, B.A. (2000). Don't get blown away by the e-Health explosion. Nursing Spectrum, 13(20IL), 10-11.

Brooks, B.A., & Dorpinghaus, A. (1999). Off to graduate school. Nursing Spectrum, 12(16), 12-13.

Brooks, B.A., & Rossel, C. (1999). Is online learning for you? Nursing Spectrum, 12(13), 6.

Brooks, B. A., & Madda, M. (1999). Professional portfolios, a tool for staff and professional development, Journal for Nurses in Staff Development, 15(1), 5-10.

Brooks, B.A., & Barrett, S. (1998). Core competencies for outcomes management in nursing. Outcomes Management for Nursing Practice, 2(2), 39-41.

Brooks, B. A., Barrett, S., & Zimmermann, P. (1998). Creating your professional portfolio. Journal of Emergency Nursing, 24, 555-557.

Brooks, B. A., & Massanari, K. (1998). On line implementation of NANDA nursing diagnoses. Computers in Nursing, 16, 320-326.

Brooks, B. A. (1996). Back to school – At work. Nursing Spectrum, 8(11), 17.

Brooks, B. A., & Rosenberg, S. (1995). Incorporating nursing theory into a nursing department strategic plan. Nursing Administration Quarterly, 20 (1), 81-89.

## **Poster Presentations**

Brooks, B. A., & Massanari, K. (1997, November). Implementation of NANDA on-line. Poster presented at the Premiere Conference on Nursing Diagnosis, Interventions and Outcomes, St. Charles, IL.

Brooks, B. A. (1995, October). A long-term investigation of the effect of work redesign on nurses' attitudes and perceptions. Poster

presented at the 3<sup>rd</sup> Annual Nursing Research Conference, Northwest Indiana Nursing Research Consortium, Merrillville, IN.

Brooks, B. A. (1995, November). Incorporating nursing Theory into a Nursing Department Strategic Plan. Poster presented at Advancing Nursing Practice, University of Chicago Hospitals, Nursing Research Symposium, Chicago, IL.

### **Paper Presentations**

Brooks, B.A. (2000, July). Web-based Patient Education: A Look to the Future. Paper presented at the 10<sup>th</sup> Annual Summer Nursing Informatics Institute, University of Maryland, Baltimore, MD.

Brooks, B. A. (1995, March). Development of an Instrument to Measure Quality of Nurses' Work life. Paper presented at the 4<sup>th</sup> International Conference on the Quality of Nurses' Work life, University of Toronto, Ontario, Canada.

### **Web Chat Host**

Brooks, B.A. (2000, October 18). Online nursing. *Nursing Spectrum*. [www.nursingspectrum.com](http://www.nursingspectrum.com)

### **Presentations**

Brooks, B.A. (2000, October). Developing Your Resume. *Nursing Spectrum* 2000 Fall Career Expo, Oakbrook Terrace, IL.

Brooks, B. A., & Barrett, S. (1999, November). On-line Education as a Revenue Center. Sigma Theta Tau International Biennial Convention, San Diego, CA.

Brook, B. A., & Barrett, S. (1999, November). Career Directions You Never Imagined. Sigma Theta Tau International Biennial Convention, San Diego, CA.

Brooks, B.A. (1998, May). Keynote address. Sigma Theta Tau International Induction Ceremony, Epsilon Upsilon Chapter, Lewis University, Romeoville, IL.

Brooks, B. A., & Barrett, S. (1997, December). How to Prepare an Outstanding Resume. Sigma Theta Tau International Biennial Convention, Indianapolis, IN.

Brook, B. A., & Barrett, S. (1997, December). How to Prepare a Professional Portfolio. Sigma Theta Tau International Biennial Convention, Indianapolis, IN.

Brooks, B. A., & Barrett, S. (1997, September). Marketing Yourself and Your Career. Workshop presented at the Midwest Alliance for Nursing Informatics Fall meeting, Arlington Heights, IL

Brooks, B. A., & Barrett, S. (1997, February). Presenting a Professional Image. Guest lecture at Women's Health Connection, Chicago, IL.

Brooks, B. A. (1996, February). Presenting a Professional Image. Guest lecture at Women's Health Connection, Chicago, UL.

Brooks, B. A. (1995, June). Integrating Caring Theory into a Nursing Department Strategic Plan. Guest lecture presented at University of Illinois at Chicago, College of Nursing, Chicago, IL.

Brooks, B. A. (1995, April). Marketing Yourself and Your Career. Guest lecture presented at University of Illinois at Chicago, College of Nursing, Chicago, IL.

Brooks, B. A. (1995, March). Integrating Caring Theory into a Nursing Department Strategic Plan. Lecture presented at Chicago Nurses' Association meeting, Chicago, IL.

Brooks, B. A. (1993, May). Recruitment and Retention Strategies for Home Care. Lecture presented at the Home Health Nursing Conference sponsored by the National Center for Advanced Medical Education, Chicago, IL.

Brooks, B. A. (1993, May). Changing the Image of Nursing, One Nurse at a Time. Keynote Nurses' Week Address at Our Lady of the Resurrection Medical Center, Chicago, IL.

Brooks, B. A. (1993, April). Entrepreneurial Outreaches in Nursing: Positive Image Building. Guest lecture at the College of Nursing, Valparaiso University, Valparaiso, IN.

Brooks, B. A. (1992, October). Entrepreneurial Outreaches in Nursing. Guest lecture presented at the Student Nurses' Association of Illinois Annual Convention, Peoria, IL.

Brooks, B. A. (1992, March). The Nuts and Bolts of Recruitment Advertising. Guest lecture presented at RN Recruitment Advertising: A

Seminar for Nurse Recruiters sponsored by *The Nursing Spectrum*, Washington, DC.

### **Faculty Appointment**

2000	Assistant Professor, Adjunct Faculty, Lewis University
1998	Assistant Professor, College of Nursing, Lewis University, Romeoville, IL
1997	Adjunct Faculty, College of Nursing, Lewis University, Romeoville, IL
1995-1996	Adjunct Faculty, College of Nursing, University of Illinois at Chicago

### **Graduate Course Development**

Theories & Research Concepts I (on-line delivery), Theories & Research Concepts III, Human Resource Management, Theories & Research Concepts I, Strategic Planning for Healthcare, Healthcare Outcomes Measurement, Healthcare Marketing Workshop

### **Graduate Teaching Experience**

Healthcare Outcomes Measurement, Human Resource Management, Theories & Research Concepts I and III, Strategic Planning for Healthcare, Healthcare Marketing Workshop

### **University Committee Appointments**

University Wide Graduate Directors  
Library Committee  
Technology Committee  
Marketing Advisory Board

### **College of Nursing Committee Appointments**

Academic Affairs  
Budget Review  
Human Subjects Review  
Administrative Council  
Graduate Faculty

**Professional Memberships**

Sigma Theta Tau International  
Academy of Management  
Internet Healthcare Coalition

**Volunteer Experience**

Board of Directors, Chicago Yacht Club, Chair, Communications  
Committee, 2000-present

Event Chairperson 1992 - 1997 for the annual "Nautical Night" to  
benefit the American Cancer Society, Chicago, IL , committee member  
1998.

Event Vice-Chairperson, National Championship for Sailors with  
Disabilities, Chicago Yacht Club, Chicago, IL. 1995-present.

Adult Leader for the Sea Explorer Ship (SES) Privateer, Chicago Yacht  
Club 1994-present.