Measurement of nurse job satisfaction using the McClosky/Mueller Satisfaction Scale

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ABSTRACT

Background: Originally developed to rank rewards that nurses value and that encourage them to remain in their jobs, the McCloskey/Mueller Satisfaction Scale (MMSS) is being used extensively in research and practice to measure nurse job satisfaction. Since its original development in 1990, limited evidence of psychometric properties of the MMSS has been reported.

Objective: To investigate and report the psychometric properties of the MMSS when used in 2003 to measure hospital nurse job satisfaction.

Methods: Data from a survey of 8,456 nurses were used to establish psychometric properties of the MMSS. Dimensionality was tested using confirmatory and exploratory factor analyses. Validity of new MMSS factors was tested by investigating relationships of the new factors with theoretically related concepts and by testing ability of the new factors to predict nurses' intentions to remain employed in their hospitals. Reliability coefficients of the new factors are reported.

Results: The original eight factors could not be replicated satisfactorily using confirmatory factor analysis. Exploratory factor analysis found a seven-factor model rather than the original eight factors previously reported. Validity of this new model was supported. However, similar to the original instrument, weak internal consistency reliability coefficients were found for three of the new MMSS factors

Discussion: From a research perspective, using an instrument with 23 items that measure 7 aspects of nurse job satisfaction is more desirable than an instrument with 31 items. However, MMSS items must be redeveloped to improve internal consistency of factors.

Key Words: Factor analysis, job satisfaction, McClosky/Mueller Satisfaction Scale, psychometric testing

Introduction

Measurement of job satisfaction has been undertaken for a variety of research and practice purposes. The McCloskey/Mueller Satisfaction Scale (MMSS) is one instrument commonly used in nursing research and in healthcare administrative practice to measure nurse job satisfaction. The purpose of this paper is to describe the psychometric properties of the MMSS as used with a large sample of Canadian nurses working in Ontario acute care hospitals. This is accomplished by reviewing the development of the MMSS, describing how the MMSS has been used in nursing research and practice, reporting on confirmatory and exploratory factor analyses and other tests of validity, reporting reliabilities of the newly derived MMSS subscales, and making recommendations about use and need for further redevelopment of the instrument.

Development of the MMSS

McCloskey (1974) laid the groundwork for this instrument by creating a scale to identify and rank rewards and incentives nurses valued and that encouraged them to remain in their jobs. This initial scale was grounded in Maslow's theory of hierarchy of needs (Maslow, 1954) and Burns' theory of motivation (Burns, 1969). According to Maslow and Burns, needs are physiological or psychological wants or desires that motivate individuals to seek to satisfy by acquiring incentives or achieving goals. Further, the rewards desired by an individual are based on a hierarchy of needs. According to Maslow, this hierarchy from lowest to highest consists of the following five categories of needs: physiologic, safety, social (belongingness), ego (esteem), and self-actualization. The lowest level of unsatisfied need has the greatest motivating potential.

When developing this original scale, McCloskey (1974) grouped hospital nurse rewards and incentives into three distinct categories or domains: safety, social, and psychological. The safety dimension of job satisfaction was conceptualized to include satisfaction with salary, benefits, and work scheduling. The social dimension of job satisfaction was conceptualized to include satisfaction with maternity leave support, childcare facilities, immediate supervisor support, relationships with peers, and opportunities to socialize with colleagues. The psychological dimension of job satisfaction included satisfaction with work responsibility, opportunities for further education, praise and recognition, and control over work activities.

After 36 items were developed to reflect rewards and incentives in the three categories, 94 nurses who had resigned recently from their jobs in two urban hospitals were asked to rate whether they might have stayed employed in their previous jobs had their employer offered more of what was identified in that item. Though rewards and incentives related to each category of

rewards and incentives were identified as important, McCloskey (1974) reported that the domain of psychological rewards had the greatest influence on nurse retention than were safety or social rewards.

In 1990, Mueller and McCloskey revised McCloskey's original reward satisfaction scale with the intent of developing an easy to use, valid, and reliable instrument that measures nurse job satisfaction. Thirty-three items were constructed based on McCloskey's previous work on the three dimensions of incentives or rewards hypothesized to promote job satisfaction: safety, social, and psychological dimensions (Mueller & McCloskey, 1990). In this instrument, the safety dimension of job satisfaction was conceptualized to include satisfaction with salary and benefits, balance of family and work, and opportunities to work straight days. The social dimension was conceptualized to include satisfaction with supervisor support, relationships with peers, and opportunities to socialize with colleagues. The psychological dimension included satisfaction with praise and recognition, control over work activities, and professional opportunities (Mueller & McCloskey).

Responses to items were rated using a 5-point Likert scale ranging from 1 (very dissatisfied) to 5 (very satisfied). This instrument was administered to 190 nurses in 1983 and 1984 that worked in one large urban hospital. Confirmatory factor analysis was used to test the existence of the three hypothesized domains of job satisfaction. Mueller and McCloskey (1990) reported that a three-factor model did not fit the data. Exploratory factor analysis was completed and yielded eight distinct factors that were conceptualized as satisfaction with: extrinsic rewards, scheduling, balance of family and work, co-workers, interaction opportunities, professional opportunities, praise and recognition, and work control and responsibility. Because two of the original 33 items did not load onto any factor, these two items were recommended for omission in the instrument. This instrument was named the MMSS.

Mueller and McCloskey (1990) suggested that these eight factors could be grouped into the three originally hypothesized job satisfaction domains. Safety rewards included three job satisfaction factors: extrinsic rewards, scheduling, and balance of family and work. Social rewards included two job satisfaction factors: co-workers and interaction opportunities. Psychological rewards included the remaining three job satisfaction factors: professional opportunities, praise and recognition, and work control and responsibility (Mueller & McCloskey). Reliabilities for the eight subscales ranged between .52 and .84. Only four of the subscales had alpha reliabilities of .70 or higher and four had reliabilities less than the desirable minimum value of .70 (Nunnally & Bernstein, 1994).

Mueller and McCloskey (1990) also suggested that a global job satisfaction scale could be calculated by summing all 31 items. The global job satisfaction indicator was reported to have a Cronbach alpha coefficient of .89. They acknowledged the limitations of combining all items to form a global job satisfaction scale as factor analysis demonstrated that the 31 items yielded eight factors measuring distinct aspects of job satisfaction.

Mueller and McCloskey (1990) also reported criterion-related validity of the MMSS instrument compared to several other established job satisfaction instruments, including the Brayfield Roth Global Satisfaction Scale and Hackman and Oldhams's Job Diagnostic Survey. They reported positive correlations ranging between .53 and .70 when correlated with the MMSS subscales. They concluded that the 31-item MMSS instrument demonstrated adequate internal consistency, factor stability, and criterion-related and construct validity.

Use of the MMSS in nursing research

The MMSS is one of the most commonly used tools to measure nurses' attitudes towards their jobs and has been used to identify job satisfaction in a variety of clinical and geographical settings, including mental health (Brodell, 199; Flannery & Van Gaasbeek, 1998), long-term care (Robertson, Higgins, Rozmus, & Robinson, 1999), public health (Cumbey & Alexander, 1998), home healthcare (Lynch, 1994), rehabilitation (Crose, 1999), rural settings (Anderko, Robertson, & Lewis, 1999), and ambulatory care (Wilkinson & Hite, 2001). Healthcare administrators also have used the MMSS to measure levels of nurse job satisfaction and to identify which aspects of job satisfaction should be strengthened strategically to promote nurse recruitment and retention (Roberts, Jones, & Lynn, 2004; Tang, 2003).

Even though the MMSS is based on factors thought to reflect American values and realities, this instrument has been used with international nursing populations. For example, the MMSS was used to measure job satisfaction with nurses in the West Bank. It was concluded that only four of the eight MMSS factors were considered important to nurses working in the West Bank (Abu Ajamieh, Misener, Haddock, & Gleaton, 1996).

Although the MMSS has been commonly used to measure nurse job satisfaction, some have suggested that the psychometric properties no longer are considered adequate (Roberts, Jones, & Lynn, 2004). Roberts et al. (2004) used the MMSS to examine job satisfaction of recent baccalaureate graduates employed in various settings. They questioned the current relevance of the eight-factor structure and inadequate reliabilities of four of the eight MMSS subscales. They concluded that further exploration of the psychometric properties of the MMSS was required.

In this study, the theoretical perspective of three categories of rewards and incentives (safety, social, and psychological) leading to nurse job satisfaction proposed by Mueller and McCloskey (1990) was adopted, recognizing that these three categories of rewards and incentives could be measured using the eight factors comprising the MMSS. This paper contains a description of findings of the psychometric properties of the MMSS when used with a sample of Canadian hospital nurses.

Methods

The study context

Over 13,000 nurses working in Ontario, Canada, acute care hospitals were surveyed between February and May 2003 as part of two studies examining nursing-related determinants of 30-day mortality and unplanned hospital readmission. The sampling plan was developed from the 2003 College of Nurses of Ontario registration database. All registered nurse and registered

(licensed) practical nurse registrants who reported on their 2003 registration renewal form that they worked in a medical, surgical, or critical care area in an Ontario teaching or community acute care hospital were included in the study. Surveys were mailed to nurses' homes. A reminder card was mailed 10 days after the initial survey was mailed. A second complete survey was mailed to non-responders 4 weeks after the initial survey was mailed and was followed 10 days later by a reminder card. Ethical approval for these studies was obtained from the university ethics review board.

Study instruments

The Ontario Nurse Survey 2003 was nine pages in length and included sections inviting respondents to describe where they worked within their hospitals, their evaluation of quality of patient care, their career intentions, their history of injury from a patient-contaminated sharp, their job-related feelings (burnout), the condition of their professional practice environments, their job satisfaction, selected patient discharge processes of care in their units, and demographic information. Three commonly used instruments were included in the Ontario Nurse Survey 2003.

The Maslach Burnout Inventory (MBI), a 22-item instrument with 7-point response options, was used to assess nurse burnout. This instrument is well validated and remarkably stable and was used to measure three components of burnout: emotional exhaustion, depersonalization, and personal accomplishment. Evidence of both reliability and validity of the MBI as well as scoring procedures have been documented (Maslach, Jackson, & Leitner, 1996).

The Revised Nursing Work Index (NWI-R), a 49-item instrument with 4-point response options, was used to measure various components of the condition of the professional nursing practice environment including nurse manager ability and support, nurse participation in hospital affairs, nursing foundations for quality care, adequacy of staffing and resources, and collegial relationships among nurses and physicians (Lake, 2002). Evidence of there liability and validity of the NWI-R and its subscales as well as scoring procedures have been documented (Estabrooks et al., 2002; Lake).

The MMSS was used to measure eight components of nurse job satisfaction, including satisfaction with extrinsic rewards, scheduling, balance of family and work, co-workers, interaction opportunities, professional opportunities, praise and recognition, and control and responsibility (McCloskey & McCain, 1987; Mueller & McCloskey, 1990). Respondents rated their satisfaction for each item on a 5-point Likert scale ranging from very dissatisfied (1) to very satisfied (5).

Sample

Of the 13,093 nurses surveyed, 8,456 nurses (65% of surveyed nurses) completed the survey. An additional 3% of nurses returned incomplete surveys. Respondents worked in 105 different hospital sites. Of these, 14 were teaching hospitals, 40 were large community hospitals, and 51 were medium-sized community hospitals. The sample of nurses included 6,856 registered nurses and 1,325 registered practical nurses. Table 1 contains descriptions of the mean age, mean years experience as

a nurse, percentage of males, percentage working full-time, percentage routinely working 12-hr shifts, and percentage of baccalaureate educated nurses for the whole sample and for each of the registered nurse and registered practical nurse categories.

Analysis

Analyses were completed using the SPSS version 11.5 (Chicago, IL). Analyses focused on testing MMSS instrument dimensionality, validity testing, and factor internal consistency reliability.

Using the theoretical framework adopted in this study, there are three domains of rewards and incentives that reflect nurse job satisfaction and these three domains can be measured with the eight-factor MMSS; thus, dimensionality of the MMSS was first examined by means of a confirmatory factor analysis with principal components analysis (PCA) using orthogonal rotation (varimax) to obtain a distinct and interpretable solution. Because this confirmatory factor analysis was unable to acceptably replicate the eight-factor solution found by Mueller and McCloskey (1990), an exploratory PCA with varimax was implemented to explore instrument dimensionality.

Three criteria are used to validate inclusion of items loading on a factor. First, items must have a factor loading of at least .50 to be included in a factor. In orthogonal rotated factors, a factor loading expresses the correlation between the item and the underlying dimension or factor. It is through examination of factor loadings that one is able to determine which items belong to that factor (Polit & Beck, 2004; Streiner & Norman, 2003). The choice of a minimum factor loading is usually set between .40 and .60. In this study, the minimum factor loading was set as .50. Second, to find a distinct and parsimonious factor structure, if an item cross-loads on two factors with a loading greater than .30 on the second factor, it must be eliminated from both factors. Third, because items in factors must make sense conceptually to enable interpretation of the essence of that factor, any item that is conceptually unacceptable to a factor should also be deleted from the factor (Streiner & Norman, 2003; Tourangeau & McGilton, 2004).

Table 1 Sample description

Variable	All Sample	Registered Nurses	Registered Practical Nurses
Age*	43.1 (9.4)	42.6 (9.5)	45.8 (8.7)
Years experience as a nurse*	17.8 (9.9)	17.6 (9.9)	19.6 (9.9)
Percentage male	3.6	3.8	3.0
Percentage full time*	59.0	60.7	50.4
Percentage working 12-hr shift	69.8	76.5	34.7
Percentage with baccalaureate*	18.7	21.8	2.3

Note. * Statistically significant on the variable between registered nurses and registered practical nurses ($p < .05$).

Validity of the newly derived MMSS factors is explored by testing hypothesized correlations between the new subscales with measures of theoretically related constructs and by testing

the ability of new MMSS factors to predict nurses' intentions to remain employed. To examine internal consistency of each new MMSS factor, reliability coefficients of the new factors are measured.

Results and Interpretation

Dimensionality

A confirmatory factor analysis was implemented using PCA with varimax to force an eight-factor model solution for the 31-item MMSS instrument. The eight factors explained 61.1% of variance. Once the three previously described criteria were implemented to validate inclusion of items loading on a factor, 6 factors with 16 items remained. Four of the 31 items did not load on any factor (items 4, 10, 31, and 23), 9 of the 31 items double-loaded on two factors (items 7, 14, 16, 17, 20, 24, 25, 26, and 29), and two items loaded on factor eight that had an eigenvalue less than 1.0 (items 11 and 12). Further, the seventh factor in the model did not have any items that loaded satisfactorily making it a non-interpretable factor. Table 2 contains a comparison of the confirmatory factor analysis findings with the original MMSS factor structure, including eigenvalues and the percentage of explained variance for each factor. Eigenvalues and percentage of explained variance were not reported for each of the original eight factors and could not be compared with those found in this study.

Because using confirmatory factor analysis could not replicate a satisfactory eight-factor structure, an exploratory PCA with varimax was implemented and yielded seven factors with eigenvalues greater than 1.0 (Table 3). These seven factors explained 57.9% of variance. Twenty-six of the original 31 items had loadings greater than .50 on at least one of seven factors. Five of the 31 items did not load on any factor and, therefore, should be eliminated from use (items 4, 10, 16, 21, and 23). Examination of all item loadings showed that three additional items loaded on two factors and also should be eliminated from

(items 7, 20, and 26). The remaining 23 items each had a loading greater than .50 on one factor and fit conceptually with other items in each factor.

Table 4 contains a summary of the seven new factors including eigenvalues and the amount of variance explained by each factor. Two newly derived factors reflected nurses' satisfaction with psychological rewards. The new Factor 1, "satisfaction with work conditions and supervisor support," accounted for 13.34% of variance. All six items constituting this new factor were also on the two original MMSS subscales of "satisfaction with praise and recognition" and "satisfaction with work control and responsibility." In these analyses, those two original factors collapsed into one factor. The new Factor 5, "satisfaction with scholarly opportunities," also reflected satisfaction with psychological rewards and explained 7.40% of variance. This new factor consisted of two items from the original MMSS factor "satisfaction with professional opportunities." The other two items from the original "satisfaction with professional opportunities" subscale did not load satisfactorily on any factor.

Three newly derived factors reflected nurse satisfaction with safety rewards. New Factor 2 "satisfaction with scheduling" explained 10.69% of variance and consisted of four of six items in the original MMSS subscale "satisfaction with scheduling," with the other two items of the original subscale not loading on any factor. Newly derived Factor 6 "satisfaction with salary and benefits" consisted of the identical items as in the original MMSS subscale "satisfaction with extrinsic rewards." The third factor reflecting satisfaction with safety rewards was new Factor 7 "satisfaction with support for family responsibilities" and consisted of two of three items of the original MMSS subscale "satisfaction with balance of family and work." This new factor explained the least amount of unique variance of all seven factors (4.13%). The structure of factor seven is noteworthy as it contained only two items (numbers 11 and 12) that had different factor loading directions (.711 and -.706) suggesting that although these two items belong together in a factor, respondents

Table 2 Comparison of confirmatory factor analysis findings with original McClosky/Mueller Satisfaction Scale factor structure

Original Factor Title	Original Factor Items	Newly Derived Factor Items	Eigenvalue (New)	Percentage of Explained Variance (New)
Control and responsibility	22,23,29,30,31	13,22,30,31	8.84	28.53
		(24 and 29 double loaded)		
Scheduling	4,5,6,8,9,10	5,6,8,9	2.35	7.59
Interaction opportunities	16,17,18,19	18,19	1.77	5.72
		(17 and 20 double loaded)		
Professional opportunities	20,21,27,28	27,28	1.39	4.49
Extrinsic	1,2,3	1,2,3	1.38	4.45
Coworkers	14,15	15	1.18	3.81
		(14 and 16 double loaded)		
Praise and recognition	13,24,25,26	No items	1.03	3.30
		(25 and 26 double loaded)		
Balance of family and work	7,11,12	11,12	0.99	3.21

Note. Total explained variance is 61.1%. Reported eigenvalues and percentages of explained variance for each factor reflect values when all items are retained in the factor. For those factors where items are not included, these values would be less than the stated values. Refer to Table 3 for brief description of content for each item

Table 3 Factor structure for seven new factors

Item Number and Descriptor	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
1.Salary	.054	.057	.019	.126	.015	**.725**	.099
2.Vacation	.148	.258	.068	.080	.089	**.697**	.021
3. Benefits	.129	.098	.080	.031	.082	**.729**	-.047
4. Work hours	.168	.488	.107	.142	.069	.335	.175
5. Schedule flexibility	.253	**.702**	.113	.087	.090	.113	.080
6. Work days	.182	**.692**	.056	.035	.114	-.016	-.119
7. Part-time	-.014	.504*	.096	.113	.164	.003	.362
8. Weekends off	.106	**.725**	.062	.066	.010	.222	-.031
9. Flexibility weekends	.176	**.816**	.089	.043	.040	.079	-.045
10. Weekend pay	.140	.472	.103	.011	.014	.421	-.083
11.Maternity leave	.040	.124	.125	.033	.055	.173	**.711**
12.Child care	.039	.152	.088	.062	.201	.116	**-.706**
13.Supervisor	**.613**	.142	.088	.132	.000	.022	-.046
14.Peers	.112	.048	.179	**.776**	.006	.034	.050
15.Physicians	.207	.064	.201	**.520**	.032	.123	-.086
16.Care delivery	.355	.104	.348	.454	-.069	.029	.079
17.Work social contact	.199	.156	**.723**	.293	-.003	.044	.079
18.Social contact outside	.104	.111	**.762**	.241	.071	.039	.052
19.Interact disciplines	.250	.109	**.696**	.152	.178	.098	-.024
20.Interact faculty	.204	.080	.515*	-.040	.475	.104	-.107
21.Committee	.359	.096	.420	.008	.373	.127	.071
22.Control setting	.751	.161	.222	.107	.154	.102	-.008
23.Career advance	.479	.205	.145	.067	.456	.184	.055
24.Superior recognition	.680	.201	.063	.255	.241	.110	-.063
25.Peer recognition	.188	.090	.084	.727	.213	.102	.009
26.Feedback	.541*	.173	.062	.486	.232	.092	-.047
27.Research	.257	.100	.088	.152	.786	.049	-.012
28.Publish	.131	.088	.087	.082	.824	.036	-.049
29.Responsibility	.532	.120	.192	.275	.053	.120	.120
30.Control conditions	.777	.168	.153	.094	.084	.116	.029
31.Decision making	.714	.105	.148	.076	.276	.114	.021

Note. *Items that loaded > .5 on one factor but also had a loading > .3 on another factor. These items are deleted from any factor.

who reported being satisfied with maternity benefits also reported being unsatisfied with hospital child care services. In Canada, residents have access to up to 1 year of paid parental leave but much less access to child care services associated with their places of employment.

The two other newly derived factors reflected satisfaction with social rewards. New Factor 3 "satisfaction with social and interaction opportunities" consisted of three of four items in the original MMSS subscale "satisfaction with interaction opportunities." New Factor 4, "satisfaction with collegial relationships and recognition," consisted of the same two items as in the original "satisfaction with co-workers" subscale plus one additional item about satisfaction with recognition from peers. In these analyses, recognition from peers did not group with recognition from supervisors.

Correlations among the original eight subscales as used in this study ranged from .21 to .66. Correlations among the new factors ranged from -.01 to .50 (Table 5). As expected, Factors 1 through 6 are moderately and positively correlated with each other ranging between .20 and .50. Correlations of factors one through six with factor seven are much smaller and range from -.11 to .04. These findings likely reflect the different directions of the factor loadings of the two items, resulting in weak and sometimes small negative correlations with other factors.

Validity Testing

Hypothesis testing was completed to examine validity of the seven new MMSS factors. Relationships were tested between newly derived MMSS factors and subscales of the MBI and NWI-R. First, it was hypothesized that nurses who experienced higher burnout were more likely to report lower job satisfaction. It was expected that all newly found factors of the MMSS would be mildly to moderately inversely correlated with the emotional exhaustion and depersonalization subscales of the MBI and positively related with the personal accomplishment subscale of the MBI. Each of these three MBI subscales is known to measure aspects of burnout. Job-related burnout is conceptualized as high levels of emotional exhaustion and feelings of depersonalization and low levels of feelings of personal accomplishment (Maslach, Jackson, & Leitner, 1996). These relationships were hypothesized because of previously found evidence of associations between job satisfaction and both nurse burnout and condition of the nursing practice environment (Table 6; Aiken, Clarke, & Sloane, 2002; Fletcher, 2001; Greenglass, Burke, & Fiksenbaum, 2001). Evidence to support the hypothesis was found with one consistent exception. Moderate inverse relationships were found ranging from -.11 to -.46 between the first six new MMSS factors with the three MBI scales (p < .0001). There was no correlation between any of the

Table 4 Summary of new factors

Factor Number and Description	Items in Factor	Factor Eigenvalue	Explained Variance	Reliability Coefficient
1. Satisfaction with work conditions and supervisor support	6 items (numbers 13, 22, 24, 29, 30, and 31)	8.84	13.34%	.85
2. Satisfaction with scheduling	4 items (numbers 5, 6, 8, and 9)	2.35	10.69%	.80
3. Satisfaction with social and interaction opportunities	3 items (numbers 17, 18, and 19)	1.77	8.1%	.78
4. Satisfaction with collegial relationships and support	3 items (numbers 14, 15, and 25)	1.39	7.44%	.64
5. Satisfaction with scholarly opportunities	2 items (numbers 27 and 28)	1.38	7.40%	.80
6. Satisfaction with salary and benefits	3 items (numbers 1, 2, and 3)	1.18	6.84%	.67
7. Satisfaction with support for family responsibilities	2 items (numbers 11 and 12)	1.03	4.13%	.31

Note. Total variance explained by these seven factors was 57.93%. Refer to Table 3 for brief description of content for each item.

three MBI subscales and the seventh new MMSS factor "satisfaction with support for family responsibilities." This finding is likely a reflection of the different directions of factor loadings for the two items constituting factor seven (items 11 and 12).

Second, it was hypothesized that nurses who worked in stronger professional nursing practice environments characterized by supportive and able managers, adequate staffing and resources, and collegial work relationships would experience higher job satisfaction. Therefore, it was expected that the following three subscales of the NWI-R measuring the professional nursing practice environment would be mildly to moderately correlated with all new MMSS factors: nurse manager ability and support, adequacy of staffing and resources, and collegial relationships among nurses and physicians (Table 6). Evidence to support the hypothesis was found with the same consistent exception found previously. Moderate positive relationships ranging from .19 to .73 were found between the first six new MMSS factors with the three NWI-R subscales measuring the condition of the practice environment ($p < .0001$). There was no correlation between any of the three NWI-R subscales and the seventh new MMSS factor "satisfaction with support for family responsibilities."

Validity of the new MMSS factors was further evaluated by exploring whether the new MMSS factors predicted nurse intention to remain employed. Others have found that job satisfaction is the most important predictor of nurse intention to remain employed (Lu, Lin, Wu, Hsieh, & Chang, 2002; Shader, Broome, Broome, West, & Nash, 2001; Sourdif, 2004). Nurse respondents were asked to rate how likely they were to continue working at their current hospital until retirement on a 4-point scale ranging from 1 (very unlikely) to 4 (very likely). Multiple regression analysis was used to regress nurse intention to remain employed scores on the seven new MMSS subscales as well as nurse age. This model explained 25% of variance in intention to remain employed, $F = 238.88$, $p < .0001$. However, only five of seven job satisfaction factors were found to be statistically significant predictors of intent to remain employed with p values

less than .05: Factors 1, 4, 5, 6, and 7. Each of these job satisfaction factors was positively related with intention to remain employed. This finding supports predictive ability of the new MMSS factors.

Reliability Testing

In this study, internal reliability coefficients for the original eight MMSS subscales ranged from .29 to .84. Three of the original MMSS subscales had unacceptably low alpha reliability coefficients: satisfaction with extrinsic rewards (.67), satisfaction with balance of family and work (.29), and satisfaction with coworkers (.56). These low reliability coefficients are consistent with low coefficients originally found by Mueller and McCloskey (1990). Internal reliability coefficients for the seven new factors ranged from .31 to .85 (Table 4). Three of the new factors have reliability coefficients less than the acceptable minimum criterion of .70: satisfaction with collegial relationships and support, satisfaction with salary and benefits, and satisfaction with support for family responsibilities. These three factors have similar structures as the original three MMSS factors that demonstrated weak internal consistency coefficients.

Discussion

A seven-factor job satisfaction factor structure consisting of 23 items was found instead of the original eight-factor model that included the 31 items developed and validated by Mueller and McCloskey (1990). The seven-factor model found in this study continues to be consistent conceptually with the theoretical foundation of the original MMSS. The three conceptual dimensions of rewards including safety, social, and psychological dimensions that reflect nurse job satisfaction remain distinguishable in the new factor structure. Safety rewards include nurse satisfaction with scheduling, satisfaction with salary and benefits, and satisfaction with support for family responsibilities. Together, these three factors explain 21.66% of variation in nurse job satisfaction. Social rewards include nurse

Table 5 Correlations among seven new factors

New Factors	Factor 1: Work Conditions	Factor 2: Scheduling	Factor 3: Social Opportunities	Factor 4: Collegial Relationships	Factor 5: Scholarly Opportunities	Factor 6: Salary and Benefits
Factor 2: Scheduling	0.45 $p < .001$					
Factor 3: Social opportunities	0.42 $p < .001$	0.27 $p < .001$				
Factor 4: Collegial relationships	0.50 $p < .001$	0.26 $p < .001$	0.43 $p < .001$			
Factor 5: Scholarly opportunities	0.43 $p < .001$	0.25 $p < .001$	0.24 $p < .001$	0.27 $p < .001$		
Factor 6: Salary and benefits	0.33 $p < .001$	0.34 $p < .001$	0.21 $p < .001$	0.24 $p < .001$	0.20 $p < .001$	
Factor 7: Support for family	-0.03 $p = .001$	-0.02 NS	0.04 $p = .0002$	-0.01 NS	-0.11 $p < .001$	0.02 NS

Note. NS refers to correlation not statistically significant at the .05 probability level.

satisfaction with social and interaction opportunities and satisfaction with collegial relationships and support. Together these two factors explain 15.44% of variation in nurse job satisfaction. Psychological rewards include nurse satisfaction with work conditions and supervisor support as well as satisfaction with scholarly opportunities. Together these two factors explain 20.74% of variation in job satisfaction. Mueller and McCloskey (1990) had reported that psychological rewards were considered by hospital nurses to be more important than were safety or social rewards for nurse job satisfaction that led to nurse retention. In this study, safety rewards and incentives explained the most variation in job satisfaction, followed by psychological rewards or incentives. Social rewards explained the least amount of variance in job satisfaction.

Validity of the seven new factors of the MMSS was supported through hypothesis testing and tests of predictive validity. With the exception of factor seven, hypothesized relationships were found between MMSS factors and subscales of the MBI and the NWI-R. Using multiple regression analysis, the seven new MMSS factors and nurse age predicted 25% of variation in nurses' intentions to remain employed in their current hospitals. Although these seven new factors demonstrated some adequate psychometric properties related to validity and reliability, the instrument continued to exhibit weaknesses, particularly with respect to low internal consistency coefficients for three factors.

Internal consistency refers to the extent that an instrument,

or a subscale of an instrument, is measuring the same trait and is a common approach to assessing measurement error that arises from sampling of items (Polit & Beck, 2004). Similar low reliabilities were reported in this study as were reported with the original MMSS instrument development and testing (Mueller & McCloskey, 1990). Low reliability coefficients pose a particular challenge when an instrument is used for research purposes because the minimum criterion for subscale reliability is usually set at .70. Generally, further analyses are not completed on subscales with reliability coefficients that fall below that criterion. For this reason, it is essential that the MMSS be redeveloped to promote improved internal reliability within subscales.

According to Streiner and Norman (2003), a variety of strategies can be implemented to promote higher internal consistency among items in instrument subscales. These strategies include revalidating and exploring additional constructs and related items with key nurse informants, rewording items to ensure terms used are current (e.g., remove term "maternity leave" and substitute with "parental leave"), using minimal but sufficient number of words in each item (e.g., instead of item "your immediate supervisor," modify term to "relationship with your immediate supervisor"), and omitting value-laden or biased terms (e.g., replace current item "opportunity to work straight days" with revised item "opportunity to work preferred shifts").

There are a variety of explanations for differences found in factor analysis findings between this study and the original

Table 6 Summary of correlations among new MMSS factors with MBI and NWI-R subscales

New MMSS Factors	MBI-EE	MBI-DP	MBI-PA	NWI-R Manager	NWI-R Staffing	NWI-R Collegial
Factor 1: Work conditions	-.46	-.32	.26	.73	.56	.44
Factor 2: scheduling	-.29	-.21	-.17	.32	.31	.23
Factor 3: Social opportunities	-.29	-.17	.16	.29	.34	.29
Factor 4: Collegial relationships	-.30	-.24	.24	.33	.31	.45
Factor 5: Scholarly opportunities	-.20	-.15	.11	.29	.25	.24
Factor 6: Salary and benefits	-.22	-.14	.12	.21	.23	.19
Factor 7: Support for family	-.02 (*NS*)	.02 (*NS*)	.00 (*NS*)	-.01 (*NS*)	-.02 (*NS*)	-.01 (*NS*)

Note. All correlations have probabilities G .0001 except where noted with NS (not significant correlation). MMSS = McCloskey/Mueller Satisfaction Scale; MBI-EE = the emotional exhaustion subscale of Maslach Burnout Inventory; MBI-DP = the depersonalization subscale of Maslach Burnout Inventory; MBI-PA = the personal accomplishment subscale of Maslach Burnout Inventory; NWI-R manager = the nurse manager ability and support subscale of the Revised Nursing Work Index (NWI-R); NWI-R staffing = the adequacy of staffing and resources subscale of the NWI-R; NWI-R collegial = the collegial relationships among nurses and physicians subscale of the NWI-R.

development of the MMSS. The original instrument was developed more than 20 years ago and tested on a relatively small group of nurses (Mueller & McCloskey, 1990). The current study data were collected in 2003. With passage of time, work conditions and employment agreements have changed. For example, nurses' pay and benefits have increased and improved supports for balancing family and work have been put in place by many employers. In Canada, parental leave and financial support is available for all employees for extended periods of time to support family life. This may explain why new factor seven "satisfaction with support for family responsibilities" has such poor reliabilities when used with Canadian nurses. One of the two items refers to satisfaction with maternity leave and the other refers to satisfaction with child care. Because Canadian legislation supports extended paid parental leave for up to 1 year, Canadian respondents likely would rate their satisfaction with this item as relatively high. However, there are not yet consistent supports for child care across Canada and, therefore, Canadian nurses are more likely to rate their satisfaction with this item as much lower than their satisfaction with maternity leave.

As well as having strong validity and reliability properties, research instruments should be as succinct as possible to minimize respondent burden and research costs related to data collection, data coding and cleaning, and data analyses (Tourangeau & McGilton, 2004). In research, including fewer measures of concepts usually leads to higher statistical power. If nurse job satisfaction can be effectively measured using 23 items collapsing into seven subscales as found in this study rather than eight subscales, analytical models using these subscales will have more power. In the Canadian context and in other jurisdictions with similar support for parental leave and lack of support for childcare, it is advisable to consider use of only six scales as new Factor 7 "satisfaction with support for family responsibilities" has very poor internal consistency.

Further redevelopment and testing of the MMSS is required to minimize potential sources of error related to adequacy of sampling of items. Improving internal consistency of the instrument will lead to increased utility and credibility of the MMSS as a valid and reliable measure of nurse job satisfaction

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