

Impact of nurses' uniforms on patient and family perceptions of nurse professionalism

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Abstract

Background: Patients and visitors may perceive nurses as professional based on uniform color and style. Nurse image may affect patient and visitor trust and satisfaction with nursing care. Fitted white dresses have been replaced by loose-fitting or scrub white, colored, or patterned pant sets.

Objectives: This study examines nurse professionalism by assessing the nurse image traits of eight pant uniforms as perceived by pediatric patients, adult patients, and adult visitors. We also examined if uniform preference is congruent with nurse image traits.

Method: A convenience sample of 499 patients and visitors were surveyed at a large Midwestern tertiary health care center. Subjects viewed photographs of the same registered nurse identically posed in eight uniforms and rated each by image traits. Kruskal–Wallis, Steel–Dwass multiple comparison method, and Wilcoxon signed-rank sum tests were used to test for differences in the Nurse Image Scale (NIS) score by uniform style and color and subject demographics.

Results: Subjects were 390 adult patients and visitors (78%) and 109 pediatric patients (21.4%); 66% were female, and 78% were Caucasian. In adults, NIS scores for white uniforms (two styles) were higher than NIS scores for uniforms with small print, bold print, or solid color (all $p < .001$). White uniform NIS score increased with subject age (all $\leq .007$). In pediatric patients (7–17 years) and young adults (18–44 years), the highest uniform NIS scores did not differ significantly from the others. Uniform preference was different from NIS score in pediatric and adult subjects, reflecting noncongruence between the perception of nurse professionalism by uniform and uniform preference.

Discussion: With aging, adults create perceptions of nurse professionalism based on uniform color and style. Traits of nurse professionalism were highest in white uniforms. Future research is needed to determine if transition to white nurse uniforms improves patient and family satisfaction with nursing care.

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1. Introduction

Nursing uniforms have changed significantly during the past 25 years. Loose-fitting white, colored, and patterned scrubs with tennis shoes or clogs have replaced the fitted white dress, white leather shoes, and nursing school cap of yesterday. Dresses and skirts have become less common, and short smock jackets have replaced long laboratory coats.

Nurses' appearance may affect interactions with patients and family members and may shape patient and family perceptions of nurse professionalism and image. Additionally, nonstandardization of uniform color on a single unit or throughout a hospital may increase difficulty in differentiating nurses from other hospital personnel.

Few researchers have examined the impact of the nursing uniform on nurse professionalism and image. Mangum, Garrison, Lind, Thackeray, and Wyatt (1991) studied nurse image to determine an association with uniforms. Researchers designed a survey of 10 professional nurse image traits

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(confident, competent, attentive, efficient, approachable, caring, professional, reliable, cooperative, and empathic) described in the nursing literature, labeled as the Nurse Image Scale (NIS). Subjects were shown pictures of a nurse wearing different uniforms and asked to rate each uniform by nurse image traits. A NIS sum score represented a measure of nurse professionalism. One hundred patients, 30 nurses, and 15 administrators from a single hospital participated. Overall, respondents ranked white dress and cap as the preferred uniform. However, mean ratings of uniforms based on professional image varied by respondent group: Nurses and administrators rated the white top and pants with stethoscope highest, and patients rated the white dress with cap highest. Interestingly, patient scores for the highest rated uniform were not significantly different from those for the white pant set without stethoscope or cap, white pant set with cap, street clothes with laboratory coat, designer scrub pant set in maroon color, or white pants with colored top (Mangum et al., 1991), reflecting that most uniform colors and styles had a similar professional image although preferences were different.

Two other research groups used the nurse image traits of Mangum et al. (1991) to assess professionalism by nurse uniforms. In the first study, Mangum, Garrison, Lind, and Hilton (1997) replicated their previous work in a larger multisite sample of 2,430 patients, nurses, and administrators. The white pant uniform and stethoscope set had the highest mean score for professional image and was the preferred choice of patients, nurses, and administrators. Colored scrubs and street clothes with a laboratory coat were least preferred by patients and administrators, and street clothes with a laboratory coat were least preferred by nurses. Similar to a previous report of Mangum et al. (1991), patients' ($n = 1,173$) mean scores for professional image were not significantly different for any of the nine uniform colors and styles (Mangum et al., 1997). The second study involved 180 hospitalized adults who rated photographs of nurses in pant uniforms with jacket, in white, royal blue, and lavender pants and jacket with print top (Skorupski & Rea, 2006). A white uniform represented the nurse image traits of confidence, reliability, competence, professionalism, and efficiency, and a print uniform represented nurse image traits such as caring, attentive, cooperative, empathetic, and approachable. Patients chose the nurse in a white uniform as being the easiest to identify; however, they selected the nurse in a print uniform as one they would like to take care of them (Skorupski & Rea, 2006).

Two studies assessed nurse uniform preferences in hospitalized children. Meyer (1992) compared children who had been previously hospitalized with those who had never been hospitalized to learn if nurse image was based on uniform style. One hundred children aged 3–5 years were asked to choose the nurse they would like to care for them and the nurse they would fear after viewing five 8×10 -in. photographs of a nurse wearing four uniforms and street clothes. The nurse wearing a colorful smock top was most

preferred; the nurse wearing a white dress uniform was most feared. This study was similar to Mangum et al. (1991, 1997); however, it used photographs of a nurse interacting with children, not a nurse in a neutral pose facing forward. The nurse's facial features and expressions varied by picture. In the picture most feared by children, the nurse's hair fell forward as she leaned down toward the child. The nurse's nose stood out, but her eyes and mouth were obscured (Meyer, 1992). In a second study on a children's hospital ward, nurses' uniforms were associated with the hospital ward atmosphere and the friendliness of the nurse. Families preferred nurses to be approachable rather than authoritative, suggesting that a more casual nursing uniform conveyed friendliness and confidence (Campbell, O'Malley, Watson, Charlwood, & Lowson, 2000).

The limitations of published literature on nurse uniforms and nurse professionalism include the following: (a) subject choice, because nurses and administrators may have had a clear uniform preference that biased their selections; (b) the presence of uniform accessories in pictures, because nurse professionalism might have been influenced by the presence of a stethoscope, laboratory coat, or nursing cap; (c) nurse pose and facial expression, because subtle but visible nuances could affect a person's view on any level; and (d) data collection methodology, because rank ordering forces one uniform option to supercede others when that might not be the case. In addition, literature examining the impact of the nurse's uniform on nurse professionalism and image was not conducted in an ambulatory setting, and visitors of pediatric and adult patients have not been studied. In nurse uniform studies conducted with pediatric patients, nurse image traits identified by Mangum et al. (1991, 1997) were not used. The present study was initiated to minimize the knowledge gap of patient and visitor perceptions of nurse image based solely on nurse uniform color and style. Ambulatory and hospitalized pediatric and adult patients and adult visitors were included.

1.1. Purpose and research questions

This study was designed to determine if nurse uniform style and color affected perceptions of nurse professionalism based on 5 nurse image traits in pediatric subjects and 10 nurse image traits in adult subjects. Other aims were to learn if nurse uniform was an important indicator of nurse professionalism, if nurse image by uniform color and style was affected by subject characteristics, if individual nurse image traits were associated with a specific uniform color or style, and if uniform preference correlated with the uniform having the highest score based on nurse image traits.

2. Methods

2.1. Setting and sample

This prospective comparative design used a convenience sample of adult visitors, adult ambulatory and hospital



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Fig. 1. Photographs of one nurse wearing eight uniform pant set color and style options. (1) Bold-print top and pressed blue pant; (2) blue scrub top and blue scrub pant; (3) white tunic top and pressed white pant; (4) blue tunic top and pressed blue pant; (5) white scrub top and white scrub pant; (6) bold-print top and pressed white pant; (7) small-patterned-print-on-white-background top and pressed blue pant; (8) small-patterned-print-on-white-background top and pressed white pant.

patients, and pediatric ambulatory and hospital patients in a $\geq 1,000$ -bed urban Midwestern tertiary care teaching center. After receiving Institutional Review Board approval, awake and alert patients aged 7–100 years and visitors aged 18–100 years who understood spoken and written English were approached in waiting rooms of outpatient clinics and hospital floors and in patient rooms of various hospital units, including intensive care, medical, surgical, and pediatric areas. Exclusion criteria for patients and visitors included the

following: those waiting to have same-day outpatient/inpatient surgery or a major invasive procedure such as cardiac catheterization; developmental or cognitive impairment; hemodynamic or emotional instability; or inability to verbally communicate due to intubation, sleeping or obtunded state, or drug therapy affecting cognition.

The uniform policy for nurses working in adult patient care floors, intensive care units, and ambulatory areas is to wear white. Nurses working in children’s hospitals (pediatric

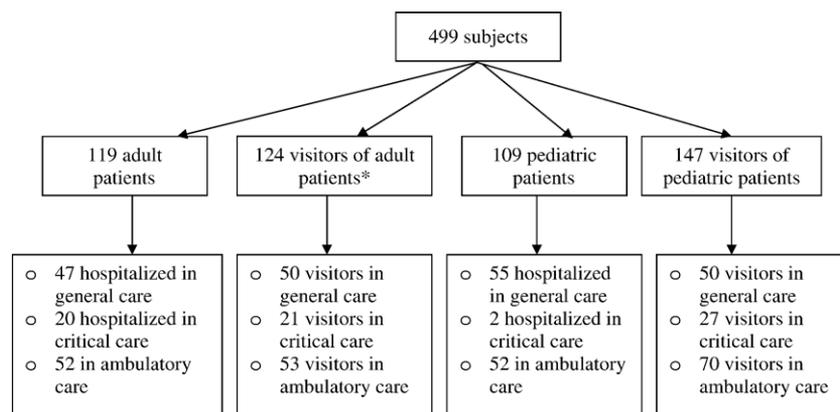


Fig. 2. Schematic of subject selection. *Using a purposeful convenience sampling method, patients and visitors were surveyed from a variety of care settings.

Table 1
Nurse image traits in pediatric subjects

Adult trait	Pediatric trait wording
Competent	She knows how to take care of me.
Attentive	If I need her, she is there.
Approachable	I can talk to her.
Professional	She looks neat and clean.
Reliable	I can trust her.

patients) wear either all-white uniforms or pant sets (small-print-on-white-background top and white pants; i.e., Uniform 8 in Fig. 1).

2.2. Data collection procedures

Data were collected between September 2005 and February 2006. After informed consent and completion of a short demographic questionnaire, participants viewed eight identically posed 5 × 7-in. photographs of the same nurse wearing different pant uniforms (Fig. 1). Uniforms consisted of four colors or patterns in two styles: tunic top with pressed pant and scrub top with scrub pant. Each photograph was numbered and mounted on a 14 × 24-in. board, using Velcro. Counterbalancing of data collection was completed by changing the order in which photographs were viewed by subjects, using a computer-generated random number table of 500 combinations of 8 numbers. Two individuals dressed in street clothing and laboratory coats collected data. When adult subjects did not understand the meaning of a nurse image trait (i.e., empathetic), a simple standard definition was provided. Tallies were kept of subject type to ensure an adequate sample size for each of the following groups displayed in Fig. 2.

2.3. Instrumentation

2.3.1. Adult subjects

A Modified Nurse Image Scale (MNIS) designed by the investigators prompted adult subjects to judge each uniform as it related to the 10 nurse image traits identified by Mangum et al. (1991): confident, competent, attentive, efficient, approachable, caring, professional, reliable, cooperative, and empathetic. For each uniform, subjects rated each trait on a 4-point Likert-type scale ranging from 1 = *very poor match* to 4 = *great match*. An MNIS sum score (ranging from 10 to 40) was obtained from each subject for each uniform to represent an overall measure of professionalism based on uniform. Subjects also rated the importance of a nurse's uniform as an indicator of professionalism on a 3-point Likert scale of *not important at all* to *very important* and the uniform they preferred to see a nurse wear.

2.3.2. Pediatric subjects

Because nurse image traits were not simple monosyllabic words, a survey was designed by investigators to prompt pediatric subjects to judge each uniform using five statements with age-appropriate language that reflected five nurse image traits: competent, attentive, approachable,

professional, and reliable, labeled Nurse Image Scale for Children (NISC). Descriptors are provided in Table 1. For each uniform, subjects rated each trait using binary option: 2 = *good* or 1 = *bad*. A NISC sum score (ranging from 5 to 10) was obtained from each subject for each uniform, representing an overall measure of professionalism based on uniform. The five nurse image traits used were selected by expert pediatric nurse clinicians based on the developmental abilities of school-age children. After survey design and before implementation, content validity testing was completed by four pediatric master's-prepared nurses and a master's-prepared child life expert to determine if pediatric trait statements were equivalent to adult nurse image traits and if statements were clearly worded. All five pediatric traits received an acceptable content validity index of $\geq .75$, reflecting a content-valid instrument. Pediatric subjects also provided data on the uniform they preferred to see their nurse

Table 2
Subject characteristics and median NIS scores reflecting nurse professionalism, by uniform color and style ($n = 499$)

Parameter	Level	Frequency [n (%)]	
Gender	Male	169 (34)	
	Female	329 (66)	
	Missing	1	
Age (years)	7–17	109 (22)	
	18–44	163 (33)	
	45–69	167 (34)	
	70–100	54 (11)	
	Missing	6	
Ethnicity	Caucasian	389 (80)	
	African American	73 (15)	
	Hispanic	8 (2)	
	Asian	6 (1)	
	Other	13 (3)	
	Missing	10	
Patient type	Pediatric ambulatory	52 (23)	
	Pediatric inpatient; non-ICU	55 (24)	
	Pediatric inpatient; ICU	2 (< 1)	
	Adult ambulatory	52 (23)	
	Adult inpatient; non-ICU	47 (21)	
	Adult inpatient; ICU	20 (9)	
Visitor type	Pediatric ambulatory	70 (26)	
	Pediatric inpatient; non-ICU	50 (18)	
	Pediatric inpatient; ICU	27 (10)	
	Adult ambulatory	50 (18)	
	Adult inpatient; non-ICU	53 (20)	
	Adult inpatient; ICU	21 (8)	
Median NIS scores (25th percentile, 75th percentile)			
Uniform	Adults	Pediatrics	
	1	30 (22,38)	10 (9,10)
	2	30 (26,38)	10 (9,10)
	3	34 (29,40)	10 (9,10)
	4	32 (28,38)	10 (9,10)
	5	33 (28,40)	10 (8,10)
	6	30 (26,38)	10 (9,10)
	7	26 (20,30)	9 (8,10)
8	29 (20,33)	9 (8,10)	

Table 3
Paired comparison of median MNIS scores, by uniform groupings, in adults ($n = 390$)

Group 1		Group 2		p^a
Uniform	Median MNIS	Uniform	Median MNIS	
White tunic top/pressed pant	34.5	Bold-print top/blue pressed pant	30.9	<.001
White scrub top/scrub pant		Blue scrub top/blue scrub pant		
		Blue tunic top/blue pressed pant		
Small-print top/blue pant	27.0	Bold-print top/white pressed pant		<.001
Small-print top/white pant		Bold-print top/blue pressed pant	30.8	
		Blue scrub top/blue scrub pant		
		Blue tunic top/blue pressed pant		
Small-print top/blue pant	27.0	Bold-print top/white pressed pant		<.001
Small-print top/white pant		White tunic top/pressed pant	34.5	
		White scrub top/scrub pant		

^a The Wilcoxon signed-rank test was used to test for differences in MNIS scores by uniform groups. Due to multiple comparisons, MNIS scores are considered to differ if $p < .02$.

wear and which trait they felt was the most important for a nurse to possess.

2.4. Data analysis

Continuous and categorical demographic characteristics were summarized by mean and standard deviation or by frequency and percentage, respectively. Uniform preference and responses to individual traits for each uniform were summarized by frequency and percentage. MNIS and NISC scores were summarized by median and interquartile ranges. Kruskal–Wallis test, Steel–Dwass multiple comparison method, and Wilcoxon rank sum test were used to test for differences in MNIS and NISC sum scores between demographic groups. Wilcoxon signed-rank tests were used to test for differences between uniform styles.

3. Results

Fig. 2 provides a delineation of 499 subjects, of which 390 were adults and 109 were school-age children. Table 2 provides subject characteristics (by gender, age, and ethnicity) and subject type (by patient and visitor status). In adult subjects, 70% were female, 81% were Caucasian, the mean age was 50 ± 16 years, 56% were hospitalized, 33% lived in the same county as our health care center, 52% drove < 1 hour to seek care, and 90% stated that this was not their first experience being treated at our health care center. Of all

adults, 49% rated a nurse's uniform as a very important indicator of nurse professionalism, and only 13% felt that it was not important at all.

One hundred nine pediatric patients participated; 52.8% were female, 73.8% were Caucasian, the mean age was 12 ± 3 years, 52% were hospitalized, 50% lived in the same county as our health care center, 71% drove < 1 hour to seek care, and 71% stated that this was not their first experience being treated at our health care center.

3.1. Nurse professionalism by uniform color and style

3.1.1. Adult subjects

Three hundred ninety adults participated: 119 (30.4%) patients, 124 (32%) visitors of adult patients, and 147 (37.6%) visitors of pediatric patients. In adults, median MNIS scores for white uniforms (white fitted top and pressed pant set, and white scrub pant set) were highest (34 and 33, respectively), and median MNIS scores for small-print top with white pant or small-print top with solid-colored pant were lowest (29 and 26, respectively; Table 2). Thus, white uniforms (two styles), small-print uniforms (two styles), and bold-print uniforms (two styles)/solid-colored uniforms were compared. Combined median MNIS scores for white uniforms were higher than the combinations of scores for small-print or bold-print/solid-colored uniforms ($Mdn = 34.5$ vs. 27.0 and 30.9, respectively; $p < .001$; Table 3).

Table 4
Comparisons of median MNIS score, by age, in all adult subjects ($n = 390$)

Uniform	Age (years)	n	Median MNIS	p^a	Group 1 (years)	Group 2 (years)	p^b
White tunic top/pressed pant	18–44	159	31	<.001	18–44	45–69	<.001
	45–69	158	36		18–44	70–100	<.001
	70–100	48	40		45–69	70–100	.12
Bold-print top/blue pressed pant	18–44	159	34	<.001	18–44	45–69	<.001
	45–69	156	30		18–44	70–100	<.001
	70–100	45	30		45–69	70–100	.83

^a Kruskal–Wallis test was used to test for the overall difference in MNIS scores between the groups.

^b Steel–Dwass test was used to test for pairwise comparisons of age.

Table 5

Overall comparisons of median MNIS score, by age and adult subject type (patient or visitor; $n = 390$)

Uniform	Age (years)	n	Median MNIS	p^a	Group 1 (years)	Group 2 (years)	p^b
Adult patients							
White tunic top/pressed pant	18–44	28	33.5	.28			
	45–69	51	36				
	70–100	31	40				
Bold-print top/blue pressed pant	18–44	28	30.5	.13			
	45–69	51	29				
	70–100	28	26				
Adult visitors							
White tunic top/pressed pant	18–44	131	30	<.001	18–44	45–69	<.001
	45–69	107	37		18–44	70–100	.001
	70–100	17	40		45–69	70–100	.14
Bold-print top/blue pressed pant	18–44	131	34	<.001	18–44	45–69	<.001
	45–69	105	30		18–44	70–100	.21
	70–100	17	30		45–69	70–100	.83

^a Kruskal–Wallis test was used to test for the overall difference in MNIS scores between the groups.^b Steel–Dwass test was used to test for pairwise comparisons of age.

When median MNIS scores for the eight uniforms were analyzed by subject characteristics, white-uniform options (white tunic top and pressed pant, and scrub pant set) continued to have the highest median MNIS score, reflecting the most professional uniform options by nurse image traits. Of the two white-uniform options, the white fitted top and white pressed pant had the highest median MNIS score by gender, experience with our health care center, and length of time to drive to our health care center. However, the MNIS scores for the white-uniform options varied by ethnicity and by where subjects lived. Non-Caucasians and those living in the same county or outside the state rated the white scrub pant set as more professional than the white fitted top and pressed pant, compared to Caucasians and those living in the state but outside the health care center county.

Adult subjects were divided into three strata by age to determine if age influenced median MNIS scores for uniforms. Nurse professionalism by nurse image score varied by subject age for two uniform options (Table 4). Median MNIS scores for white tunic top and pressed pant were higher in the two oldest adult groups than in the younger adult group (45–69 and 70–100 vs. 18–44 years; $p < .001$). The median MNIS score for the boldly patterned top and blue pressed pant was higher in the youngest adult group than in the two oldest adult groups (18–44 vs. 45–69 and 70–100 years; $p < .001$).

Because age was a factor in uniform MNIS score, adults were further stratified by patient or visitor, and the two uniforms of interest (white tunic top and pressed pant, and boldly patterned top and blue pressed pant) were analyzed further. Nurse professionalism by the median MNIS score of two uniforms of interest varied by subject type (Table 5). In adult patients, age was not significantly related to choosing either uniform of interest as the most professional. In adult visitors, the oldest and middle-aged groups (≥ 70 and 45–69 years) differed significantly from the youngest group (18–44 years) on median MNIS score for the white tunic top and pressed pant ($p \leq .001$), and the youngest group differed

significantly from the age group 45–69 years on median MNIS score for the boldly patterned top and blue pressed pant ($p < .001$).

Table 6

Uniform median MNIS scores compared to all other uniform scores

(A) White tunic top/pressed pant (Uniform 3) compared with others in middle-aged and older adults

White tunic top/pressed pant (Uniform 3) compared with others	Adults aged 45–69 years (p)	Adults aged = 70 years (p)
vs. 1	<.001	<.001
vs. 2	<.001	<.001
vs. 4	<.001	<.001
vs. 5	<.045	<.007
vs. 6	<.001	<.001
vs. 7	<.001	<.001
vs. 8	<.001	<.001

Wilcoxon signed-rank tests were used to test for differences in median MNIS scores between groups. To account for multiple comparisons, Bonferroni correction was used. $p \leq .007$ is significant.

(B) Bold-print top and pressed blue pant (Uniform 1) compared with others in young adults

Bold-print top and pressed blue pant (Uniform 1) compared with others	Adults aged 18–44 years (p)
vs. 2	.32
vs. 3	.14
vs. 4	.45
vs. 5	.20
vs. 6	.06
vs. 7	<.001
vs. 8	<.001

Wilcoxon signed-rank tests were used to test for differences in MNIS scores between groups. To account for multiple comparisons, Bonferroni correction was used. $p \leq .007$ is significant.

Notes. (2) Blue scrub top and blue scrub pant; (4) blue tunic top and pressed blue pant; (5) white scrub top and white scrub pant; (6) bold-print top and pressed white pant; (7) small-patterned-print-on-white-background top and pressed blue pant; (8) small-patterned-print-on-white-background top and pressed white pant.

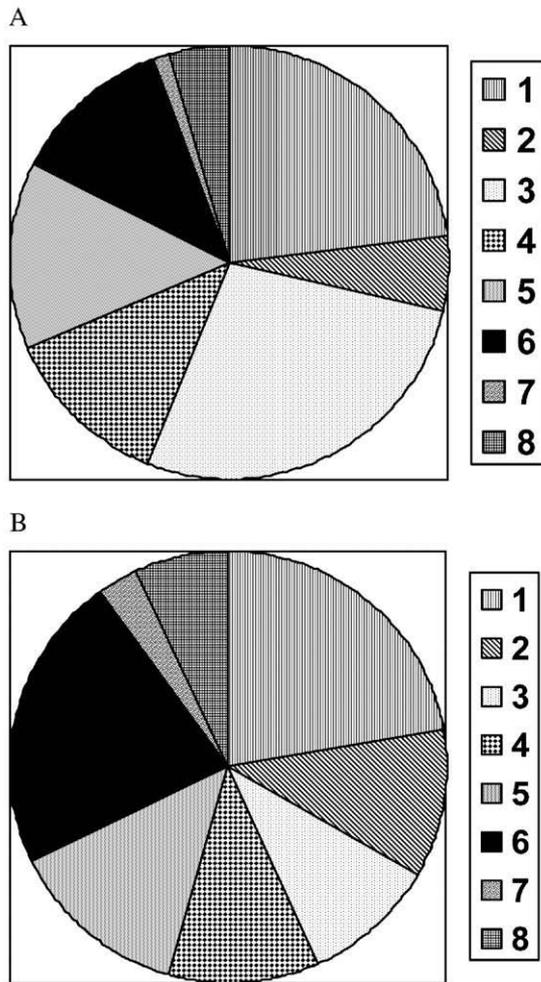


Fig. 3. Uniform preference, defined as the uniform you would most like to see a nurse wear: (A) adult preferences; (B) pediatric preferences. (1) Bold-print top and pressed blue pant; (2) blue scrub top and blue scrub pant; (3) white tunic top and pressed white pant; (4) blue tunic top and pressed blue pant; (5) white scrub top and white scrub pant; (6) bold-print top and pressed white pant; (7) small-patterned-print-on-white-background top and pressed blue pant; (8) small-patterned-print-on-white-background top and pressed white pant.

Furthermore, the highest rated uniform median MNIS scores were directly compared with the MNIS scores of the other seven uniforms by subject age category. Nurse image by uniform color and style remained significantly higher for the white tunic top and pressed pant than for the other seven MNIS scores in adults aged ≥ 70 years, even after using Bonferroni correction to control for Type 1 error (Table 6A). Both white pant uniforms (tunic top with pressed pant, and scrub set) had significantly higher median MNIS scores than the other six uniforms in adults aged 45–69 years ($p < .007$; Table 6A). However, the boldly patterned top and blue pressed pant did not have a significantly higher median MNIS score in the youngest adult cohort (aged 18–44 years) compared to white and solid-colored uniform MNIS scores. Only the poorly scoring small-print tops on white back-

ground with white or solid-colored pant had significantly lower MNIS scores compared to the boldly patterned top and blue pressed pant (Table 6B), reflecting that young adults generally do not base the nurse image of professionalism on uniform color and style.

3.1.2. Pediatric subjects

Of the five nurse image trait descriptions, 48.6% of subjects stated that the most important trait was “knows how to take care of me” (reflecting competence). When the median NISC scores for eight uniforms were compared, no differences were found (Table 2). Unlike adults, especially those aged > 44 years, nurse uniform color and style are not related to nurse professionalism based on nurse image traits.

There were no differences in median NISC scores in pediatric patients by any characteristic studied: gender, ethnicity, patient type (ambulatory or hospital), where subjects lived, length of time to drive to our health care center, or previous experience with our health care center.

3.2. Uniform preference

3.2.1. Adult subjects

Patients and visitors were asked to choose the uniform they would most prefer the nurse to wear. Overall, 25% of adults preferred the white tunic top with white pants (Fig. 3A and Table 7). Adult preferences varied when data were studied by patient versus visitor. Overall, 34% of adult patients preferred the white tunic top with white pressed pants, but 35% of adult visitors of pediatric patients preferred the bold-print top and solid-colored pant uniform as first choice. Age also affected uniform preference (Table 7). Thirty-four percent of adults aged 18–44 years preferred the bold-print top and solid-colored pant, whereas 55% of adults aged ≥ 70 years preferred the white tunic top with white pressed pant.

3.2.2. Pediatric subjects

Pediatric patients were asked to choose the uniform they would most prefer the nurse to wear. Of all subjects, 22% equally preferred the bold-print top and pressed blue pant, and bold-print top and white pressed pant (Fig. 3B and Table 7). The least preferred uniform options were the small-print-on-white-background top and pressed blue or white pant.

3.3. Individual nurse traits and uniform color and style

Individual nurse image traits were reviewed by uniform color and style to determine if notable differences existed. Table 8 provides a summary of each trait and the frequency that adults chose “great match” when completing the MNIS. Of adult subjects, the white tunic top with white pressed pant uniform (Uniform 3) received the highest frequency for 9 of 10 nurse image traits, and the white scrub pant set (Uniform 5) received the second highest frequency for 8 of 10 nurse image traits. The image trait “caring” was highest in the bold-print top and pressed white pant uniform (Uniform 6); however, there was only a one-tenth percentage difference

Table 7
Uniform preference, by subject age

Uniform	Uniform preference [<i>n</i> (%)]				
	All pediatrics	Adults, by age category			All adults
	7–17 years (<i>n</i> = 108)	18–44 years (<i>n</i> = 163)	45–69 years (<i>n</i> = 161)	≥ 70 years (<i>n</i> = 53)	≥ 18 years (<i>n</i> = 399)
1	24 (22.2)	56 (34.4)	19 (11.8)	3 (5.7)	79 (20.6)
2	12 (11.1)	11 (6.8)	6 (3.7)	1 (1.9)	18 (4.7)
3	11 (10.2)	21 (12.9)	45 (28.0)	29 (54.7)	96 (25.1)
4	12 (11.1)	18 (11.0)	23 (14.3)	2 (3.8)	44 (11.5)
5	14 (13.0)	20 (12.3)	23 (14.3)	4 (7.6)	48 (12.5)
6	24 (22.2)	17 (10.4)	15 (9.3)	8 (15.1)	42 (11.0)
7	3 (2.8)	2 (1.2)	2 (1.2)	1 (1.9)	5 (1.3)
8	8 (7.4)	6 (3.7)	7 (4.4)	1 (1.9)	14 (3.7)
No preference	–	12 (7.4)	21 (13.0)	4 (7.6)	37 (9.7)

between Uniforms 3 and 6. Of more interest, Uniforms 7 and 8 that had a small print with white-background top had the lowest nurse image trait frequencies overall. For pediatric patients, there was virtually no difference between individual median NISC scores for the eight uniforms.

4. Discussion

Different pant sets were studied to determine if uniform color and style affect perceptions of nurse professionalism, based on 10 nurse image traits. White uniforms in two styles dominated when comparing median MNIS scores in adult patients and visitors at ≥ 45 years. However, in patients aged < 18 years and in young adult patients and visitors between 18 and 44 years, no one uniform color or style emerged as having the highest nurse professionalism based on nurse image traits. Our results differ from those of other studies of nurse uniforms that used a similar assessment methodology. In both Mangum et al. (1991, 1997), patient mean scores for perceptions of nurse professionalism were not significantly different by uniform color and style. Although both Mangum et al. and Meyer (1992) focused on nursing uniforms, pictures included other aspects of image that could influence

perceptions of nurse professionalism, such as a nursing cap, stethoscope, type of shoes, and laboratory coat. It is impossible to determine if results would have been different if the only distinguishing feature of each picture was uniform color and style, rather than accessories and outerwear. In one study, nurse poses and facial expressions varied (Meyer, 1992). These nuances could have influenced the perceptions of those completing the survey.

We chose not to survey administrators and nurses who might have preconceived impressions of uniform color and style that matched preferences rather than nurse image traits. In Mangum et al. (1991, 1997), nurses and administrators might have been tempted to make uniform choice decisions by what they preferred to wear or what they preferred to see in their hospital, rather than by nurse image traits, especially because the results of the first study did not mimic the results of the second study, which was conducted at a time when nursing caps and dresses were less popular. Nurses might be inherently biased because study results could affect future wardrobe options. They may have chosen uniforms based on personal comfort, expense, and ease of caring.

Data collection methodology could have influenced results in previously conducted studies. Because subjects were asked to rank order choices in Mangum et al. (1991,

Table 8
Nurse image traits, by uniform color and style, in adult subjects (*n* = 390)

Image traits	Frequency that adults chose “great match” for each nurse image trait (%)							
	Uniform 1	Uniform 2	Uniform 3	Uniform 4	Uniform 5	Uniform 6	Uniform 7	Uniform 8
Confident	32.1	40.6	53.7	43.2	52.3	34.1	12.9	19.5
Competent	30.8	38.8	53.7	41.9	50.1	32.9	14.3	22.3
Attentive	31.6	35.7	48.3	41.3	46.1	35.9	14.1	21.8
Efficient	30.2	40.7	51.2	40.8	50.4	32.4	14.6	22.1
Approachable	42.8	33.8	44.4	39.1	42.9	43.8	21.1	26.1
Caring	42.5	30.4	45.7	36.9	44.3	45.8	20.7	26.8
Professional	30.0	43.5	57.7	44.7	51.1	34.0	15.5	21.9
Reliable	31.5	38.9	51.8	39.6	48.7	36.6	14.4	21.4
Cooperative	35.4	32.9	47.3	34.4	44.1	36.6	17.1	23.0
Empathetic	40.4	31.4	43.8	34.9	41.7	40.0	17.9	25.3

1997), it was impossible to determine if one uniform really was more professional than others, based on nurse image traits. In Skorupski and Rea (2006), patients matched nurse image traits to different uniform styles, but it was impossible to determine if one uniform style ultimately reflected greater nurse professionalism than the others.

Skorupski and Rea (2006) found that a white uniform identified the caregiver as a nurse but that patients preferred to see a nurse wear a print uniform. In our study, the white tunic top with pressed white pant followed by the bold-print top and pressed blue pant uniforms were ranked first and second by adult subjects as preferences for daily wear. Age influenced uniform preference choice and uniform as a symbol of nurse professionalism. Not only was the white tunic top and pressed pant the preference in subjects aged ≥ 70 years, but this uniform had the highest median MNIS score, reflecting the highest level of nurse professionalism. Even in younger adults aged > 44 years, white uniforms had higher MNIS scores than bold pattern or small print on white-background options or solid-colored uniforms.

No other research assessed results in adults by subject age. This might be an important topic to study further because census figures in the United States show that our population is aging. Compared to the year 2000, by 2050, there will be a 35% increase in those aged ≥ 85 years (U.S. Census Bureau Population Division, 2004). As age is also associated with hospitalization and ambulatory visits to health care centers, uniform color and style might play a role in patient-centered care, especially if individual nurse traits are highly associated with specific elements of care. For example, if a patient or visitor believes that a nurse is competent or approachable based on uniform color and style, they might be more likely to actively listen and ask questions while being educated or to engage in optimal behaviors based on instructions delivered.

Patient and visitor perception of satisfaction with care delivery and with the environment is an important quality measure. It is unknown if uniform color and style affect satisfaction with the overall health care experience or with the environment. Recognition of a nurse by a white uniform might influence patient or visitor views about how well staffed a unit is (or nurse availability) should an untold event occur. Research assessing these and other aspects of quality care as perceived by patients and visitors is needed.

Our study was limited by some factors. Because nurses in our setting wear predominantly white uniforms, it would be beneficial to replicate this study in centers that allow nurses freedom in wearing any color uniform. We chose one bold pattern and one small pattern with white-background print, only one solid color (royal blue), and only one fitted style for the white, bold-print, and solid-colored top. It is unknown if our print or solid color or style could have influenced results, especially in the two uniforms with tops that had a small print on a white background. Both tops had very low median MNIS and NISC scores compared to other uniforms. Our

selection or the fact that the small-print tops were not tucked into pants could have affected scores. All uniforms were pant sets and white tennis shoes; thus, we do not know if MNIS scores would be higher if nurses wore dresses or skirts with white leather (nontennis) shoes.

In our study, pediatric patients preferred a boldly patterned uniform top with white or solid-colored pants, consistent with the findings of Meyer (1992). Uniform preference, however, was not congruent with the image of a nurse as a professional, as determined by median NISC score. Further research is needed to determine if other uniform variables, such as stethoscope, shoe style, or laboratory coat, increase pediatric patient image of nurse professionalism by uniform; if a Likert scale would provide better discrimination in selected options over our binary response methodology; or if uniform and nurse professionalism are truly disassociated variables.

Uniforms were clean and fit our model appropriately. Bust cleavage, underclothes visible through fabric, stains, wrinkles, or pant lengths too long or too short could influence patients' and visitors' perceptions of nurse professionalism in the real world. Our adult sample was more likely Caucasian than other ethnicities. Although subanalysis based on ethnicity did not show significant differences in outcomes, a sample with more African American and Hispanic subjects would have added to the generalizability of the results.

5. Conclusion

As adults age, they create a perception of nurse image based on uniform color and style. Of uniform colors and styles reviewed, white uniform pant sets—a fitted top with pressed pant, or a scrub top and pant—are most often associated with nurse professionalism traits. White uniforms rated very high in all 10 traits of confidence, competence, attentiveness, efficiency, approachability, caring, professionalism, reliability, cooperativeness, and empathy. Children and young adults do not create perceptions of nurse professionalism based on uniform color or style. Future research is needed to determine if transition to white nurse uniforms improves patients' and visitors' perceptions of satisfaction with nursing care.

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