Section: Community Medicine

Original Research Article

A STATISTICAL STUDY ON ACCEPTABILITY OF EXISTING PATIENT GOWN DESIGN AMONG DOCTORS AND NURSES

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Received *: 08/09/2026*
Received in revised form *: 02/10/2026*
Accepted *: 16/10/2026*

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DOI: 10.70034/ijmedph.2026.4.154

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2026; 16 (4); 1016-1021

ABSTRACT

Background: The patient gown is worn by almost every hospitalised patient, yet the people who handle it daily, doctors and nurses, are rarely asked to rate how well it works. **Objective:** The objective of this study is to measure acceptability of the existing patient gown to doctors and nurses with respect to various aspects like functionality, dignity of patients and aesthetic of gown. This study also tests whether acceptability differs with change in profession, gender etc.

Materials and Methods: In this cross-sectional study, 200 clinicians (100 doctors, 100 nurses) filled the questionnaire that carried a demographic proforma and a 30-item scale, each item scored from 1 (not at all acceptable) to 5 (completely acceptable). Items fell into three domains: functional (19 question), Psychosocial (6 question) and aesthetic (5 question). Data were analysed using SPSS 22 with descriptive statistics, one-sample t-tests against Mann-Whitney test, one-way ANOVA, correlation.

Results: Mean overall acceptability was 2.82 out of 5 (SD 0.21; 95% CI 2.80-2.85), significantly below the midpoint of 3 ($t = -11.99$, $p < 0.001$). Only 28.1% of all ratings were 4 or 5, while 40.5% were 1 or 2. The aesthetic domain scored highest (3.05) and the functional domain lowest (2.77). The weakest items were ease of movement with attached devices (2.25), ease of opening and closing fasteners (2.29) and pockets (2.50); the strongest were an appearance of cleanliness (3.38), non-allergenic fabric (3.29) and odour (3.14). Doctors rated the gown higher than nurses overall (2.86 vs 2.79, $p = 0.007$), driven by the aesthetic domain (3.22 vs 2.89, $p < 0.001$, $d = 0.63$). Scores did not differ by gender.

Conclusion: Clinicians find the current gown unacceptable on all three domains with mainly for functional reasons tied to fasteners, devices and dressing. Redesign should start with quick-release closures, device-management features and adequate coverage under psychosocial needs.

Keywords: patient gown; acceptability; nurses; doctors; Likert scale; patient dignity.

INTRODUCTION

The hospital gown is the most widely worn garment in healthcare, yet it is one of the least care item compared to medicine & IPD ward type. Patients wear it during admission, examination, transfer and recovery, and clinicians must work around it every day. Qualitative work shows that the standard gown falls short on function, comfort, dignity and appearance.[1] Patients describe it as a symbol of illness that reduces their sense of control and leaves them physically and emotionally exposed.[2,5] Doctors and nurses see the patient gown from a different angle. They open it to examine the chest,

change dressings, adjust intravenous lines, manage catheters and drains, and move patients between bed, wheelchair and trolley. Their view of how well it supports these tasks is a practical measure of its value, and it is directly linked to patient safety, dignity and care efficiency.[3,4] The type of fabric material used in a patient's gown is also an important factor for infection control, because hospital fabrics can carry pathogens.[12-14]

An acceptability analysis of patient gown should be based on the functional, expressive/ psychosocial needs and aesthetic (FEA) framework.[17]

Functional needs cover ease of use, fit, mobility and physiological comfort. Expressive needs cover social and psychological comfort, including privacy and dignity. Aesthetic needs cover appearance, colour and cleanliness.

2. Literature Review

Most published gown studies are qualitative or involve small samples, and few give clinicians a structured scale that can be analysed statistically. Syed and colleagues interviewed 40 patients, clinicians and system stakeholders, including designers and launderers for their study and found that all the respondents agree that standard gown does not meet patients' needs, but cost and laundering processes make change hard.[1] Lucas and Dellasega interviewed ten patients, ten nurses and ten physicians and recorded negative impressions of the currently used gown and concluded it served neither patients nor providers well.[3] Morton and colleagues combined interviews with a survey of 928 adults and found that the gown symbolises illness, causes patients to give up control and heightens vulnerability.[2] Gabay and Ornoy reported in a cross-sectional study that wearing the gown was linked with feeling less in control, more distress and less engagement in care, and they called for design thinking in gown redesign.[5] Lopez compared four redesigned gowns and found that full back coverage and snap closures instead of ties preserved dignity and clinical function.[4] Frankel and colleagues described a novel patient gowning system as an alternative design.[6] For a specific population, Phillips and colleagues found that hospice staff valued gowns made for big-bodied patients, but wanted longer lengths, lighter fabric and more gender-neutral designs.[7] Dignity is central to how patients judge their clothing. Walsh and Kowanko compared how nurses and patients perceive dignity,[10] and Matiti and Trorey examined what patients expect when their dignity is to be maintained.[11] Baillie studied patient dignity in an acute hospital setting,[8] and Gallagher and colleagues reviewed the theoretical and empirical literature on dignity in the care of older people.[9] These studies support the expressive domain of the scale used here, which asks whether the gown covers the patient adequately and keeps the rest of the body covered during examination. Fijan and Sostar Turk reviewed hospital textiles and concluded that they can act as a vehicle for healthcare-associated infection when laundering and handling are inadequate.[12] Owen and Laird reached a similar conclusion in a review of textiles as fomites.[13] Mitchell and colleagues reviewed the role of healthcare apparel and textiles in pathogen transmission.[14] Wiener-Well and colleagues cultured pathogens from nursing and physician attire, including Staphylococcus aureus,[15] and Burden and colleagues tested whether antimicrobial scrubs reduced bacterial contamination in a randomised trial.[16] So It can be found based on literature review that mostly studies are focus on redesigning gown based on patients comfort.[1-7] A few of studies also reported doctors and nurses feedback on structured scale. Hence this study fills that gap with a 30-item acceptability scale built on the FEA framework and completed by 100 doctors and 100 nurses in different states of India.

Objectives

1. To estimate the acceptability of the existing patient gown on the functional, expressive and aesthetic domains.
2. To identify the factor/points with the lowest and highest acceptability.
3. To compare acceptability by profession, gender
4. To summarize clinicians' suggested modifications for the gown.

MATERIALS AND METHODS

3.1 Design and setting

This study is questionnaire-base cross-sectional survey as per Strobe,[18] and Cherries.[19] Data were collected from doctors & nurses from different states of India. The study period was March 2026 to August 2026.

The sample was 200 clinicians: 100 doctors and 100 nurses. Doctors were working physicians, senior and associate consultants, assistant professors and resident doctors. Nurses were staff nurses (grade I, senior and ICU), head nurses and nursing in-charges. Respondents worked across emergency, intensive care, medical and surgical wards, oncology, cardiology, neurology, orthopedics, geriatrics, pediatrics and post-operative recovery. The sample of 200 gives a 95% confidence interval of about plus or minus 0.03 around the overall mean at the observed standard deviation of 0.21.[20] All respondents answered on every question, so there are no missing data. The questionnaire applies to ordinary patient gowns. Gowns worn in the operation theatre and patients under 18 years were excluded from the evaluation, as stated on the proforma.

3.2 Data collection instrument (proforma)

The proforma, shown to respondents as a two-part form, **Part I:** General information. Hospital name, doctor's or nurse's name, age, gender, department, job title and total years of experience. Names were collected only for form integrity and are not reported in this paper.

Part II: Scale to evaluate acceptability of patient garments. Respondents rated their level of acceptance

of the existing patient gown on 30 items, each on a five-point scale: 1 = not at all acceptable, 2 = slightly acceptable, 3 = moderately acceptable, 4 = largely acceptable, 5 = completely acceptable. The items are grouped into three sections:

Section A: Functional needs (Point 1-19): ease of dressing, undressing, size and fit, mobility and physiological comfort. Examples are ease of access to the patient's body, fasteners, pockets, toilet and wheelchair use, movement with devices attached, allergenic property, thickness, suitability for summer and winter, and visibility of blood stains.

Section B: Psychosocial/ expressive needs (point no 20-25): social and psychological comfort and privacy, including appropriateness for male and female patients, suitability for all ages, adequate body coverage, covering the rest of the body during examination, and perceived hygiene.

Section C: aesthetic needs (Point 26-30): overall appearance, colour, prints, appearance of being clean and stain-free, and odour. An open question is asked at the end to get a recommendation or modification for the patient gown by respondent if any.

3.3 Data collection procedure

A meeting with individual doctor and nurse was done and requested for participation in the study. Participation was voluntary, the purpose was explained on the first page, and respondents consented before starting. Responses were exported from the form to a spreadsheet, checked for duplicate identifiers (none found), and coded for analysis.

4. Data Analysis

Mircosoft Excel based datasheet of 200 respondents was statistically analysed using SPSS 22. Domain scores were the mean of the points in each section (A: points 1-19, B: 20-25, C: 26-30), and the overall score was the mean of all 30 points. Each runs from 1 to 5, where 3 is the scale midpoint ("moderately acceptable"). A point rated 4 or 5 was counted as acceptable, and 1 or 2 as unacceptable, following common practice for Likert-type data.[22] Categorical variables are shown as frequencies and percentages and continuous variables as mean ± SD, Median as well as percentage.[21] One-sample t-test of each domain and overall score against 3. The overall score was close to normally distributed (Shapiro-Wilk W = 0.992, p = 0.389; skewness 0.10). Open-ended answers were grouped by keyword into themes and counted; because one response can fall into several themes, theme counts are indicative only. Significance was set at $p < 0.05$, two-sided.

RESULTS

5.1 Respondent profile

In total, 200 clinicians completed the form: 100 doctors and 100 nurses, 148 women (74.0%) and 52 men (26.0%) The mean age was 42.8 years (SD 10.3) and mean experience 18.6 years (SD 9.8). Doctors were older than nurses (45.7 vs 39.8 years) and had more experience (19.8 vs 17.4 years). Age and experience were almost perfectly correlated (r = 0.98), so they are not interpreted separately.

Table 1: Profile of respondents (n = 200)

Characteristic		Number (n)	Percentage (%)
Type of Clinician	Doctors	100	50.0
	Nurses	100	50.0
Gender	Male	52	26.0
	Female	148	74.0
Age	Age under 30 years	23	11.5
	Age 30-39 years	50	25.0
	Age 40-49 years	68	34.0
	Age 50-59 years	51	25.5
	Age 60 years or more	8	4.0
Experience (Years)	Experience 0-10 years	49	24.5
	Experience 11-20 years	68	34.0
	Experience 21-30 years	52	26.0
	Experience over 30 years	31	15.5

5.2 Point-level acceptability

It is observed from Table 2 that No points reached a mean of 4. Only three points rose above the midpoint of 3: appears clean and stain-free (3.38), non-allergenic fabric (3.29) and odour (3.14). The weakest points were ease of movement with devices, catheters or drains attached (2.25), ease of opening and closing fasteners (2.29), appropriateness of pockets (2.50) and the ability to keep the rest of the body covered during examination (2.51). It is also observed that on these four points, between 54.5% and 65.5% of clinicians gave a rating of 1 or 2.

Table 2: Point -wise acceptability scores (n = 200; 1 = not at all, 5 = completely acceptable)

No.	Point	Mean	SD	Median	% rated 4-5	% rated 1-2
A. Functional needs						
1	Ease of access to patient's body	2.86	1.19	3	30.5	37.5
2	Ease of putting on/taking off the patients' garments	2.58	1.19	2	23.0	51.5
3	Ease of opening/closing fasteners (buttons, ties, etc.)	2.29	1.17	2	15.0	61.5
4	Overall fit of the garments	2.84	1.10	3	26.5	37.0

No.	Point	Mean	SD	Median	% rated 4-5	% rated 1-2
5	Availability of different sizes	2.62	1.10	3	18.5	45.0
6	Appropriateness of pockets	2.50	1.16	2	23.0	56.0
7	Ease of walking	2.76	1.24	3	26.0	43.5
8	Ease of using toilets for the patients	2.83	1.12	3	28.0	38.0
9	Ease of using wheelchair for the patients	2.79	1.12	3	24.5	41.0
10	Ease of getting on and off the bed for the patients	2.88	1.22	3	31.0	38.5
11	Ease of movement when small medical devices, catheters or drain are attached	2.25	1.17	2	15.5	65.5
12	Comfort of fasteners for the patients	2.85	1.13	3	29.0	38.5
13	Non-allergenic property of the fabric	3.29	1.16	3	43.5	26.5
14	Wrinkling of the garments	2.67	1.23	2	26.5	51.5
15	Thickness of the fabric	2.96	1.17	3	31.5	34.5
16	Warmth or coolness of the garment	2.90	1.16	3	31.0	35.5
17	Appropriateness for summers	2.88	1.13	3	30.5	38.5
18	Appropriateness for winters	2.88	1.14	3	28.0	37.5
19	Easy visibility of blood stains on the fabric for early detection of bleeding	2.90	1.10	3	26.0	35.0
B. Psychosocial /Expressive needs						
20	Appropriateness for male patients	2.90	1.17	3	29.5	34.5
21	Appropriateness for female patients	2.96	1.14	3	29.5	36.5
22	Suitability for all age groups	2.91	1.17	3	31.0	34.5
23	Ability to cover patient's body appropriately	2.67	1.12	3	20.5	46.5
24	Ability to keep rest of the body covered while one body part is examined	2.51	1.18	2	20.0	54.5
25	Perceived hygiene by patients	2.96	1.24	3	33.5	34.5
C. Aesthetic needs						
26	Overall appearance of the garments	2.98	1.09	3	29.5	31.0
27	Colour of the garments	2.81	1.21	3	25.0	42.5
28	Prints or look of the fabric	2.95	1.14	3	31.0	36.0
29	Appears clean and stain free	3.38	1.12	3	49.0	21.0
30	Odour of the garments	3.14	1.21	3	37.5	30.0

5.3 Domain scores and reliability

It is observed from Table 3 that all three domains sit close to the midpoint, but the two that matter most for clinical use fall below it. The functional domain (2.77) and Psychosocial/ expressive needs domain (2.82) were significantly lower than 3, while the aesthetic domain (3.05) was not different from 3 ideal scale (p = 0.174). Overall, only 28.1% of the 6,000 ratings were 4 or 5, against 40.5% rated 1 or 2 (Table 3, Figure 1).

The 30 points correlate with each other almost not at all (mean inter-point r = -0.002). it means the domain means describe the average level of acceptability well, but the scale should not be treated as one dimension, and it needs validation before it is used as a total score for individuals.[23-25]

Table 3: Domain scores, response distribution and reliability (n = 200)

Domain	Mean	SD	95% CI	Range	% of ratings 4-5	% of ratings 1-2	t test vs 3 scale point	p
A. Functional (point 1-19)	2.77	0.26	2.73-2.80	2.16-3.58	26.7	42.8	-12.73	<0.001
B. Expressive/ Psychosocial (point 20-25)	2.82	0.44	2.76-2.88	1.83-4.00	27.3	40.2	-5.73	<0.001
C. Aesthetic (point 26-30)	3.05	0.55	2.98-3.13	1.40-4.60	34.4	32.1	1.36	0.174
Overall (point 1-30)	2.82	0.21	2.80-2.85	2.23-3.47	28.1	40.5	-11.99	<0.001

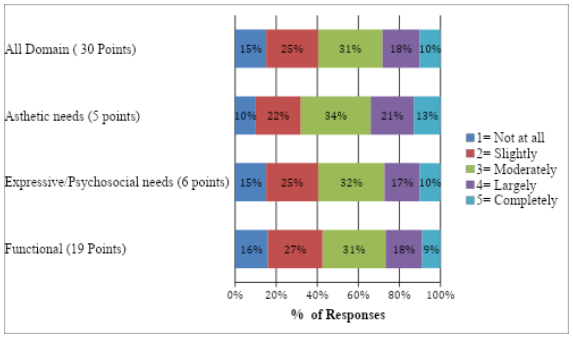


Figure 1: Percentages of Responses with respect to different domain of acceptability

5.4 Doctors compared with nurses

It is observed from Table 4 that doctors rated the gown slightly higher than nurses overall (2.86 vs 2.79; p = 0.007 for t test and Mann-Whitney p = 0.028.The difference in rating came almost entirely from the aesthetic domain (3.22 vs 2.89, p < 0.001.Functional and expressive scores did not differ by profession.

Table 4: Comparison of domain scores by profession (mean (SD)

Comparison / domain	Group 1 Doctors (n = 100)	Group 2 nurses (n = 100)	p (t-test)	p (Mann-Whitney)
Functional	2.79 (0.26)	2.74 (0.26)	0.131	0.183
Expressive	2.79 (0.45)	2.85 (0.43)	0.326	0.407
Aesthetic	3.22 (0.52)	2.89 (0.53)	<0.001	<0.001
Overall	2.86 (0.21)	2.79 (0.20)	0.007	0.028

5.5 Domain compared with respect to gender

It is observed from Table 5 that there is no difference in domain rating with respect to gender of clinical respondent (doctor & nurses).

Table 5: Comparison of domain scores by gender type (mean (SD)

Comparison / domain	Group 1 Male (n = 52)	Group 2 female (n = 148)	p (t-test)	p (Mann-Whitney)
Functional	2.78 (0.29)	2.76 (0.25)	0.673	0.912
Expressive	2.80 (0.48)	2.83 (0.43)	0.728	0.979
Aesthetic	3.11 (0.52)	3.03 (0.56)	0.358	0.377
Overall	2.84 (0.23)	2.82 (0.20)	0.579	0.969

In the open-ended question, all 200 respondents suggested a change. The most suggested modification were catheter and drain-bag holding loops (21 respondents, 10.5%), more rear overlap for coverage (17, 8.5%), colour-coded size hems or tabs (15, 7.5%), a shorter length or side slits to prevent tripping (14, 7.0%), and tear-away sleeves for central lines (13, 6.5%). [Figure 2]

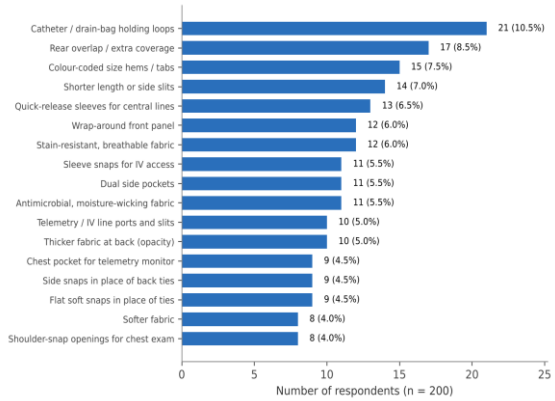


Figure 2: Percentage of modification type suggested by respondent

DISCUSSION

It is observed that doctors and nurses rated the current patient gown at 2.82 out of 5, below the "moderately acceptable" midpoint, and about two in five ratings were 1 or 2. This agrees with qualitative reports published in research papers in which patients, nurses, physicians and other stakeholders all judge the standard gown as falling short of their needs.[1-3] This survey adds a measure of how large the shortfall is and where it needs design modification.

The result & discussion about the Psychosocial / expressive needs point, it can be concluded that the patient's gown scored low due to inadequate coverage of the body (2.67) and keeping the rest of the body covered during examination (2.51). Dignity depends on privacy, control and respectful handling of the body,[8-11] and patients describe the gown as a source of vulnerability and loss of control.[2,5] That clinicians independently rate the gown poorly on coverage and supports redesign a patient gown such as side snaps, shoulder openings and wider overlap, and it shows that the concern is not limited to patients.

This study also able to give design modification in patients gown as follow: (1) quick-release closures and sleeve snaps for dressing and line access; (2) loops, ports or slits for catheters, drains and telemetry; (3) wider overlap and side or shoulder openings to preserve dignity during examination; (4) a full range of sizes and a functional pocket. These design modifications can be tested in a pilot and compared with the baseline scores reported in this study.

CONCLUSION

All respondent clinical staff (100 doctors and 100 nurses), statistically reported that the existing patient gown was rated below the midpoint of acceptability (2.82 out of 5), and its functional performance was weakest (2.77). The lowest-rated features were ease of movement with attached devices, fasteners, dressing and undressing, pockets and body coverage during examination. Cleanliness, fabric allergenicity and odour were the best-rated features, but still not widely rated as acceptable. Doctors were somewhat more positive than nurses, mainly on aesthetic items, and acceptability did not differ by age, gender. Redesign should give priority to quick-release closures, device-management features, better coverage and complete sizing, and the scale used here should be validated before wider use.

Limitation of Study: The study cannot show which gown design is best. Future work should validate the scale, add patient ratings, and trial redesigned gowns.

Acknowledgment

The authors thank all doctors and nurses for giving their time to complete the survey, for facilitating data collection.

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