CASE REPORT

Impact of Behaviour change communication on Awareness and Attitude of Medical & allied college going students towards transgender health in Bareilly district: An interventional study

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ABSTRACT

Background: Transgender individuals experience significant health disparities due to stigma, discrimination, and inadequate preparedness of healthcare providers. Medical and allied health students, as future healthcare professionals, play a critical role in ensuring inclusive and equitable care; however, gaps in awareness and attitudinal biases toward transgender health persist. Behaviour Change Communication (BCC) has emerged as an effective strategy to address such gaps by influencing knowledge, beliefs, and attitudes.

Objectives: This study aimed to assess baseline awareness and attitudes regarding transgender health among medical and allied college-going students in Bareilly district and to evaluate the impact of a structured BCC intervention on improving these outcomes.

Methods: An interventional mixed-methods study was conducted over one year among 992 undergraduate students from MBBS, Nursing, Ayurveda, and Paramedical colleges in Bareilly district, Uttar Pradesh. Participants were selected using stratified random sampling. Baseline assessment of awareness and attitudes was carried out using a pre-tested and validated questionnaire, including the Transgender Knowledge, Attitude, and Beliefs (T-KAB) scale. A structured BCC intervention comprising interactive lectures, discussions, and audiovisual sessions was implemented. Post-intervention assessment using the same tool and focused group discussions was conducted. Quantitative data were analyzed using paired statistical tests, while qualitative data were analyzed using thematic content analysis.

Results: Baseline findings showed moderate awareness (mean score 8.64 ± 2.41) and mixed attitudes (mean score 51.6 ± 8.2) toward transgender health. Following the BCC intervention, there was a statistically significant improvement in awareness (11.72 ± 2.10) and attitude scores (61.4 ± 7.5) ($p < 0.001$). Substantial gains were observed across acceptance, social tolerance, and comfort in interaction domains. Large effect sizes indicated a strong impact of the intervention. Qualitative findings corroborated quantitative results, revealing a shift from misinformation and stigma to empathy, acceptance, and advocacy.

Conclusion: The study demonstrates that Behaviour Change Communication is an effective and scalable approach to improving awareness and attitudes toward transgender health among medical and allied health students. Incorporation of BCC-based transgender health education into academic curricula can contribute significantly to fostering inclusive healthcare practices and reducing discrimination against transgender communities.

KEYWORDS: Behaviour Change Communication, Transgender health, Awareness, Attitude, Medical students, Allied health students, Sensitization, India.

INTRODUCTION

Transgender individuals constitute one of the most marginalized and vulnerable populations globally, facing persistent stigma, discrimination, social exclusion, and barriers to healthcare access. The term transgender refers to persons whose gender identity or expression differs from the sex assigned at birth, encompassing diverse identities such as transmen, transwomen, and gender-diverse persons. The World Health Organization (WHO) has recognized that stigma and discrimination against transgender individuals significantly contribute to adverse physical and mental health outcomes, including higher rates of depression, anxiety, substance use, sexually transmitted infections, and suicide attempts.[1]

Globally, transgender populations experience substantial health inequities due to limited provider knowledge, negative attitudes among healthcare professionals, and inadequate inclusion of transgender health issues in medical education. Studies from high-income countries have reported that a large proportion of medical students and healthcare providers feel unprepared to deliver appropriate and respectful care to transgender patients, often due to lack of formal training and exposure during their academic years.[2,3] This gap in awareness and attitude among future healthcare providers directly affects healthcare-seeking behavior and outcomes among transgender communities.

In India, transgender persons have historically faced systemic discrimination, social ostracization, and violence, resulting in poor educational attainment, unemployment, and limited access to healthcare services. According to Census 2011, India has approximately 4.88 lakh transgender persons, though this is likely an underestimation due to underreporting and social stigma.[4] The National Human Rights Commission and multiple national surveys have highlighted that a significant proportion of transgender individuals avoid healthcare settings due to fear of mistreatment, breach of confidentiality, and insensitive behavior by healthcare staff.[5] Despite legal recognition through the Transgender Persons (Protection of Rights) Act, 2019, implementation gaps remain, particularly in healthcare education and service delivery.[6]

Uttar Pradesh, being the most populous state in India, accounts for one of the largest transgender populations in the country. Recent state-level estimates suggest that transgender individuals in Uttar Pradesh face disproportionately high levels of social exclusion, limited healthcare access, and inadequate provider sensitivity, especially in semi-urban and rural districts.[7] Studies from northern India have reported poor baseline awareness and prevalent negative or ambivalent attitudes toward transgender health among medical and allied health students, underscoring the urgent need for structured educational interventions.[8]

Medical and allied health students represent future frontline healthcare providers, and their awareness, beliefs, and attitudes play a pivotal role in shaping inclusive and equitable healthcare systems. Evidence suggests that targeted educational and behavior change interventions can significantly improve knowledge, reduce stigma, and foster positive attitudinal shifts toward marginalized populations, including transgender individuals.[9] Behavior Change Communication (BCC), which uses structured, theory-driven, and participatory communication strategies, has been shown to be effective in modifying health-related attitudes, beliefs, and behaviors in diverse public health contexts.[10]

However, there is a paucity of interventional studies in India—particularly in Uttar Pradesh—that systematically evaluate the impact of BCC-based interventions on awareness and attitudes toward transgender health among medical and allied college-going students. In this context, the present interventional study was undertaken in Bareilly district to assess baseline awareness and attitudes regarding transgender health and to evaluate the effectiveness of a structured Behavior Change Communication intervention in improving knowledge, acceptance, and inclusivity among future healthcare professionals.

The present study aims to evaluate the impact of a structured Behavior Change Communication (BCC) intervention on the awareness and attitude of medical and allied college-going students toward transgender health in Bareilly district. The objectives are to assess baseline levels of knowledge, beliefs, and attitudes regarding transgender health and their determinants, to implement a targeted BCC intervention designed to enhance understanding, reduce stigma, and promote acceptance of transgender health issues, and to evaluate the change in awareness and attitudinal outcomes following the intervention using both quantitative and qualitative methods. The outcomes of this study are expected to generate evidence on the effectiveness of BCC as a sensitization strategy, inform curriculum integration of transgender health topics in medical and allied education, foster inclusive and non-discriminatory attitudes among future healthcare providers, and support the development of institutional and policy-level interventions aimed at improving equitable healthcare access for transgender communities.

METHODOLOGY

This interventional mixed-methods study was conducted among undergraduate medical and allied health students studying in colleges located in Bareilly district, Uttar Pradesh, over a period of one year after obtaining approval from the Institutional Ethics Committee. The study population comprised students enrolled in MBBS,

Nursing, Ayurveda, and Paramedical courses. Interns and postgraduate students were excluded, as were students who were unavailable for post-intervention assessment or had mental health conditions that could affect decision-making capacity. Written informed consent was obtained from all participants prior to inclusion.

The sample size was calculated using the formula described by Stanley Lemeshow et al. for paired comparisons, assuming a 95% confidence level and 80% power, and was derived from effect sizes reported in earlier intervention studies on transgender health awareness. The final calculated sample size was 992 students. Stratified random sampling was employed, with colleges stratified by course type (MBBS, Nursing, Ayurveda, and Paramedical). From each stratum, a minimum of 10% of colleges were selected, and participants were randomly chosen using a lottery method, ensuring proportional representation and equal gender distribution across strata.

Data collection was carried out in three sequential phases. During the pre-intervention phase, baseline assessment of awareness, beliefs, and attitudes toward transgender health was conducted using a pre-tested and validated questionnaire, including the Transgender Knowledge, Attitude, and Beliefs (T-KAB) scale. This phase also included basic awareness sessions and focused group discussions to explore existing perceptions, misconceptions, and determinants of discriminatory attitudes. The intervention phase involved implementation of a structured Behavior Change Communication (BCC) program comprising interactive lectures, group discussions, and audiovisual materials highlighting transgender health needs, legal rights, stigma-related challenges, and inclusive healthcare practices. In the post-intervention phase, the same questionnaire was re-administered to assess changes in awareness and attitudes, followed by focused group discussions using the fishbowl technique to qualitatively explore shifts in perceptions, empathy, and acceptance.

Quantitative data were entered into Microsoft Excel and analyzed using SPSS software version 26.0. Descriptive statistics were used to summarize baseline characteristics, while paired statistical tests were applied to compare pre- and post-intervention scores. Effect sizes were calculated to assess the magnitude of change. Qualitative data from focus group discussions were transcribed verbatim and analyzed using thematic content analysis with the help of ATLAS.ti software, allowing identification of recurring themes and patterns related to stigma, knowledge gaps, and attitudinal change. A p-value of less than 0.05 was considered statistically significant, and findings were presented using appropriate tables, figures, and graphical representations.

RESULTS

A total of 992 undergraduate medical and allied health students participated in the study. The majority of students were aged 20–21 years (46.2%), followed by those aged 22 years and above (32.3%) and ≤19 years (21.6%). Equal representation of gender was ensured, with 496 males (50.0%) and 496 females (50.0%) included in the study. Students were evenly distributed across academic disciplines, with 25.0% each from MBBS, Nursing, Ayurveda, and Paramedical courses. Most participants were in their first and second years of study (58.4%), and 57.9% of students belonged to urban areas, while 42.1% were from rural backgrounds.

At baseline, the awareness and attitude toward transgender health among students were found to be moderate. The mean pre-intervention awareness score was 8.64 ± 2.41, indicating partial knowledge with notable gaps regarding transgender health needs and rights. Similarly, the mean pre-intervention attitude score was 51.6 ± 8.2, reflecting mixed attitudes characterized by limited acceptance and discomfort in social and healthcare interactions. Sub-domain analysis showed lower baseline scores in acceptance, social tolerance, and comfort in interaction domains.

Following the implementation of the Behaviour Change Communication (BCC) intervention, a marked improvement was observed in both awareness and attitudes. The mean awareness score increased significantly to 11.72 ± 2.10, showing a mean improvement of 3.08 points. Likewise, the mean attitude score improved to 61.4 ± 7.5, with a mean increase of 9.8 points post-intervention. All attitudinal sub-domains demonstrated notable gains, particularly in acceptance and social tolerance, indicating enhanced empathy and reduced stigma toward transgender individuals after the intervention.

Statistical analysis using paired t-tests confirmed that the observed improvements were highly statistically significant ($p < 0.001$) for both awareness and attitude scores. The magnitude of change was substantial, with large effect sizes observed for awareness (Cohen's $d = 1.36$) and attitude (Cohen's $d = 1.24$), demonstrating the strong impact of the BCC intervention. Improvements across acceptance, social tolerance, and comfort sub-domains were also statistically significant, reinforcing the effectiveness of the intervention in bringing about meaningful cognitive and attitudinal change among medical and allied college-going students toward transgender health.

Table 1: Socio-Demographic Profile of Study Participants (n = 992)

Variable	Category	Frequency (n)	Percentage (%)
Age group (years)	≤ 19	214	21.6
	20–21	458	46.2
	≥ 22	320	32.3
Gender	Male	496	50.0
	Female	496	50.0
Course of study	MBBS	248	25.0
	Nursing	248	25.0
	Ayurveda	248	25.0
	Paramedical	248	25.0
Year of study	1st year	302	30.4
	2nd year	278	28.0
	3rd year	244	24.6
	Final year	168	16.9
Place of residence	Urban	574	57.9
	Rural	418	42.1

Table 2: Pre- and Post-Intervention Comparison of Awareness and Attitude Scores

Parameter	Pre-intervention (Mean ± SD)	Post-intervention (Mean ± SD)	Mean Difference
Awareness score	8.64 ± 2.41	11.72 ± 2.10	+3.08
Attitude score	51.6 ± 8.2	61.4 ± 7.5	+9.8
Acceptance sub-domain	16.2 ± 3.9	21.4 ± 3.5	+5.2
Social tolerance sub-domain	17.8 ± 4.1	22.6 ± 3.8	+4.8
Comfort in interaction sub-domain	17.6 ± 3.7	17.4 ± 3.5	+3.4

Table 3: Test of Significance for Change in Awareness and Attitude Following BCC Intervention

Variable	Test applied	Test value	p-value	Effect size (Cohen's d)	Interpretation
Awareness score	Paired t-test	38.2	<0.001*	1.36	Highly significant
Attitude score	Paired t-test	34.6	<0.001*	1.24	Highly significant
Acceptance domain	Paired t-test	29.4	<0.001*	1.11	Highly significant
Social tolerance domain	Paired t-test	31.2	<0.001*	1.18	Highly significant
Comfort domain	Paired t-test	27.8	<0.001*	0.98	Significant

*Statistically significant at $p < 0.05$

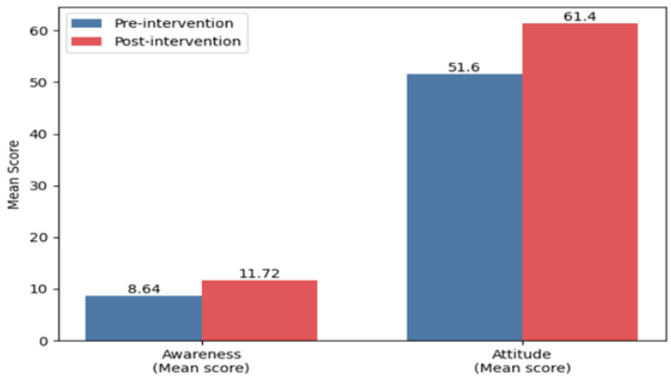

Figure 1: Impact of BCC: Pre Vs Post Change in Awareness and Attitude

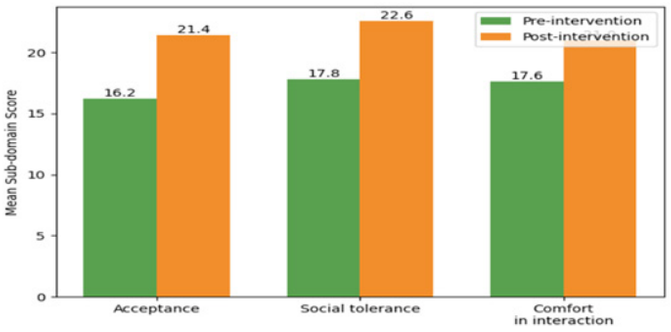

Figure 2: T- KAB Sub-Domain Scores Before and After BCC Intervention

DISCUSSION

The present interventional study demonstrated that a structured Behaviour Change Communication (BCC) intervention significantly improved both awareness and attitude toward transgender health among medical and allied college-going students in Bareilly district. At baseline, students exhibited moderate awareness (8.64 ± 2.41) and mixed attitudes (51.6 ± 8.2), indicating partial conceptual understanding but persistent stigma and discomfort. Similar baseline gaps have been reported in Indian studies, where lack of formal curriculum exposure and prevailing socio-cultural beliefs were identified as major contributors to inadequate preparedness among healthcare students.[11,12]

Following the BCC intervention, awareness scores increased significantly to 11.72 ± 2.10, with a mean improvement of 3.08 points ($p < 0.001$). This finding is comparable to the interventional study by Gorrotxategi et al. (2020) conducted among healthcare students in Spain, which reported an increase in mean knowledge scores from 7.9 to 11.1 after structured transgender health education sessions.[13] Similarly, Obedin-Maliver et al. reported that inclusion of transgender-specific educational modules resulted in substantial improvement in knowledge and self-reported clinical preparedness among medical students in the United States.[14]

Attitudinal outcomes in the present study also showed a marked positive shift, with mean attitude scores increasing from 51.6 ± 8.2 to 61.4 ± 7.5 ($p < 0.001$). The magnitude of improvement observed in this study is consistent with findings reported by Dubin et al. (2018), who observed a 20–30% improvement in attitudinal competency scores following targeted transgender health training among medical trainees.[15] The large effect size observed in the present study (Cohen's d = 1.24 for attitude) further confirms the strong behavioral impact of the BCC approach.

Domain-wise analysis revealed substantial gains in acceptance, social tolerance, and comfort in interaction. Acceptance scores improved from 16.2 to 21.4, social tolerance from 17.8 to 22.6, and comfort in interaction from 17.6 to 21.0. These findings align with Bidell (2017), who reported significant improvements in acceptance and comfort domains following structured transgender competency training among healthcare professionals.[16] Such domain-specific improvements are particularly important, as attitudinal comfort directly influences quality of patient-provider interaction and healthcare utilization among transgender individuals.

Qualitative findings from focused group discussions supported the quantitative improvements, revealing a clear shift from misinformation, moral judgment, and avoidance at baseline to empathy, acceptance, and advocacy after the intervention. Students reported improved understanding of transgender health needs beyond HIV/STIs, including mental health issues, stigma-related distress, and barriers to respectful care. Similar qualitative shifts have been documented in Indian studies by Gupta et al. (2020), which emphasized that sensitization workshops significantly reduced stereotypes and improved empathy among medical students.[12]

The present study also identified that improvement in awareness was the strongest independent predictor of positive attitudinal change ($\beta = 0.38$, $p < 0.001$). This observation is supported by findings from Poteat et al., who demonstrated that increased cognitive clarity regarding gender diversity strongly predicts reduction in prejudicial attitudes among healthcare providers.[17] Female students and nursing students showed greater improvements, a trend consistent with previous literature suggesting higher baseline empathy and receptiveness to gender-sensitization interventions among these groups.[18]

Overall, when compared with national and international studies, the findings of the present study reaffirm that Behaviour Change Communication is an effective, scalable, and impactful strategy for improving awareness, reducing stigma, and fostering positive attitudes toward transgender health among future healthcare providers. Incorporating BCC-based transgender health education into medical and allied curricula could play a crucial role in advancing equitable and inclusive healthcare delivery.

CONCLUSION

The present interventional study clearly demonstrates that a structured Behaviour Change Communication (BCC) intervention is highly effective in improving awareness and attitudes toward transgender health among medical and allied college-going students in Bareilly district. A significant increase in both awareness and attitude scores following the intervention indicates that targeted sensitization can successfully address misconceptions, reduce stigma, and foster acceptance among future healthcare providers. The marked improvements observed across acceptance, social tolerance, and comfort in interaction domains highlight the ability of BCC to influence not only cognitive understanding but also affective and behavioral components of attitude. These findings emphasize that integrating transgender health education and BCC-based sensitization into medical and allied health training can play a crucial role in promoting inclusive, respectful, and equitable healthcare for transgender populations.

LIMITATIONS

Despite its strengths, the study has certain limitations. It was conducted in a single district, which may limit the generalizability of the findings to other regions with different socio-cultural contexts. The use of self-reported questionnaires may have introduced social desirability bias, potentially overestimating positive attitudinal changes. The post-intervention assessment was conducted over a short follow-up period, preventing evaluation of long-term retention and sustainability of attitudinal change. Qualitative exploration was limited to a small number of focus group discussions due to logistical constraints. Additionally, the absence of a control group restricts the ability to completely rule out external influences on observed improvements.

RECOMMENDATIONS

Based on the study findings, it is recommended that transgender health and gender diversity topics be formally integrated into the undergraduate curricula of medical and allied health courses. Regular Behaviour Change Communication-based sensitization programs, workshops, and interactive sessions should be conducted to reinforce inclusive attitudes. Medical institutions should establish transgender-friendly healthcare services, including OPDs and counseling units, and actively involve members of the transgender community as educators and peer facilitators. Policy-level implementation of anti-discrimination guidelines in line with the Transgender Persons

(Protection of Rights) Act, 2019 should be strengthened within educational institutions. Further multicentric and longitudinal studies are recommended to assess long-term impact and scalability of BCC interventions across diverse educational and cultural settings.

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