Minding the Knowledge Gap: Impact of a "Transgender Health 101" Curriculum on Medical Students' Understanding of Transgender Healthcare, Social Issues, and Cultural Competency

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Introduction:

Background - Despite recent advances in public attitudes towards the transgender community in the US and other Western countries, transgender patients still face a high incidence of discrimination, including in healthcare settings,[1] as well as a major disparity in access to healthcare.[2] Resner et al. concludes that "the global disease and health burden of transgender people remains understudied, particularly in relation to the impact of stigma, discrimination, social, and structural factors that affect the health of this population".[3] According to Safer et al, the limited number of providers with expertise in the field of transgender care is cited by transgender patients as their most significant barrier to receiving medical care, with discrimination also being listed as a common barrier.[2] Safer's review of the available literature indicates that "transgender treatment is not taught in conventional medical curricula and too few physicians have the requisite knowledge and comfort level".[2] Many medical providers have not received education on transgender care,[4] with Dy et al. showing that those who do have exposure to transgender care report little to no exposure in a didactic learning environment.[5] Most existing research on this topic focuses specifically on graduate medical education,[5] and there is very little research focusing on undergraduate medical education. Disparities in provider education undoubtedly have the potential to negatively impact the quality of care that transgender patients receive. Academic healthcare institutions and other major healthcare entities are in a position to help address disparities in both transgender care and provider education on the subject, by offering "curricula designed to cultivate core competencies in LGBT health".[6]

Significance - According to Resner et al, "For transgender people, health inequities are hypothesized to arise from systematic exposure to multiple, intersecting social stressors, including legal and other structural factors that are the result of being part of a socially marginalized group".[3] Some transgender patients forgo medical care whenever possible to avoid discrimination and discomfort,[7] which could potentially impact their health negatively in the long-term. Sanchez et al. indicates that discrimination and other social factors are relevant barriers to care for transgender patients, in addition to lack of provider expertise,[8] as reported in Safer's literature review.[2] Overall, lack of provider education, as well as stigma and discrimination, appear to contribute disproportionately to healthcare inequities faced by the transgender community. Fortunately, there is some evidence that these factors can be addressed, at least to some extent, in the healthcare setting. Cherabie et al. used a didactic lecture on transgender health to educate a sample of medical students, residents, and faculty, using pre- and post-intervention surveys to assess changes in attitudes, beliefs, knowledge, and comfort; they found a "significant positive increase in attitude, comfort levels, and knowledge with respect to transgender health issues" after the intervention (though there was no significant change in subjects' beliefs), and these changes were found to be maintained at 90 days after the intervention.[9] Jaffer et al. found that complaints made by transgender inmates about healthcare provided to them in New York City correctional facilities decreased by 50% after implementation of an LGBT training for all healthcare staff.[10] This data provides an optimistic view of how transgender health disparities can be potentially addressed.

Aim - The objective of this study was to determine the extent to which pre-clinical medical students understood transgender healthcare, social issues, and cultural competency, and the effect that an evidence-based curriculum would have on their knowledge of these topics.

Methods:

Design - A multidisciplinary curriculum for the intervention was written in Google Docs and Google Slides, using a collection of academic resources from the fields of medicine,[11-14] psychology,[15-16] sociology,[17] and philosophy,[18] with most of the content cited from the textbook "The Equal Curriculum: The Student and Educator Guide to LGBTQ Health".[19] The didactic was also heavily informed by the lived experience of transgender patients. Pre-intervention and post-intervention surveys were designed using Google Forms, both of which included the same 19 standard questions (Table 1) intended primarily to assess students' understanding of the talk's learning objectives, as well as 2 specific non-repeated questions per survey intended to gather supplementary data.

Participants - All 112 participants were OHSU medical students in their preclinical years. A discussion-based version of the talk was offered to first-year students as part of their Fall 2022 enrichment week, with 3 students attending voluntarily, while attendance of a more traditional lecture-based form of the talk was required for second year medical students as part of their Developing Human didactics block, with 109 recorded students attending.

Measurements - Students were asked to respond to the pre-intervention survey prior to the talk, and to respond to the post-intervention survey after completion. For each survey question, students were asked to respond to a statement using a modified Lickert scale (answer choices numbered 1 through 5), with a score of 1 corresponding with a response of "not very true for me" and a 5 corresponding with a response of "very true for me". Surveys were entirely anonymized but did require that students report their graduation year in order to determine how many responses came from each class of students.

Analysis - A Wilcoxon signed ranks test, performed in SPSS, was used to compare the median survey scores from the pre- and post-intervention datasets to determine whether a significant change in response scores overall could be observed following the talk; for purposes of Wilcoxon analysis, h_0 = no difference in ranked median scores observed, and h_1 = true difference in ranked median scores observed. Additionally, mean survey scores for each question were calculated using Google Sheets to allow for more in-depth comparisons of students' responses.

Table 1	Survey questions used both pre- and post-intervention.
Question	
1	I understand the differences between gender and biological sex.
2	I understand how gender can be viewed as a spectrum.
3	I understand what it means for someone to be "transgender".
4	I understand the kinds of social issues that affect trans people.
5	I understand why it is important to use a transgender person's chosen name and pronouns.
6	I am able to sympathize or empathize with the experiences of transgender people.
7	I understand the barriers that transgender people face when accessing medical care.
8	I understand why transgender people need access to gender-affirming care.
9	I understand the purpose of offering gender-affirming hormones to transgender patients.
10	I understand the purpose of offering gender-affirming surgeries to transgender patients.
11	I understand the purpose of offering puberty blocking medications to transgender children.
12	I am able to give an example of a specific gender-affirming medical intervention offered to transgender patients.
13	I am able to give an example of a specific barrier that limits transgender patients' ability to access care.
14	I would feel comfortable working with a transgender patient in clinic.
15	I would feel comfortable interacting with a transgender person in my life outside of clinic.
16	I understand what I need to do in order to make a transgender person feel comfortable during an interaction.
17	I have respect for transgender people and their needs.
18	I am interested in learning more about transgender social issues and transgender healthcare.
19	I feel that classes I am taking or have taken during medical school have helped prepare me to work with transgender patients.

Results:

Preliminary Data - Pre-intervention responses were obtained from a total of 112 students (3 first-years and 109 second-years); post-intervention responses were obtained from only 106 students (3 first-years and 103 second-years), representing a nonresponse rate of 5.4%. Pre-intervention, students responded with a mean score of **3.02/5** to the statement **"I feel that I already know a decent amount about transgender healthcare"** and with a mean of **3.42/5** to the statement **"I feel that I already know a decent amount about transgender social issues"**, suggesting that students overall felt that they had an average to above-average understanding of the topics to be addressed. Post-intervention, students responded with a mean score of **4.6/5** to the statement **"I feel that this talk has helped prepare me to work with transgender patients"**, and with a **3.9/5** to the statement **"The material in this talk was mostly information that I already knew"**, suggesting that students felt that the intervention was beneficial despite their prior knowledge of the subject matter.

Statistical Analysis - For the 19 standard questions (Table 1), Wilcoxon analysis shows a significant positive difference between post-intervention and pre-intervention question scores. Based on the test statistics computed in SPSS, it can be said that there is a significant positive difference in the medians ($Z = -3$, $p = 0.003$) post-intervention as compared to pre-intervention (99.7% CI [4,5]), with a calculated effect size $r = -0.69$, corresponding with a large positive effect (Table 2). This suggests that the curricular intervention did lead to an overall improvement in students' understanding of and attitudes towards the topics addressed in the talk as assessed by the 19 repeated questions. Specifically, a difference in medians of 1 was seen for questions 4, 6, 7, 11, 12, 13, 14, 16, and 19, with all other questions having a difference of 0. Graphical analysis of the median scores for each standard question, performed in Google Sheets, shows that for each of the 19 questions, median score was higher post-intervention as compared to pre-intervention, with 6 individual questions (numbers 4, 7, 12, 13, 16, and 19) having differences large enough to be considered statistically significant based on the degree of error bar overlap observed (Figure 1). The most impressive increase is seen with question 19, which included the statement **"I feel that classes I am taking or have taken during medical school have helped prepare me to work with transgender patients"**, for which a gross score increase of 1.23 points was observed.

Figure 1: Mean survey response scores before and after curricular intervention, by question number. The degree of error bar overlap for each pair of datapoints is directly associated with the likelihood that the observed difference is due to chance.

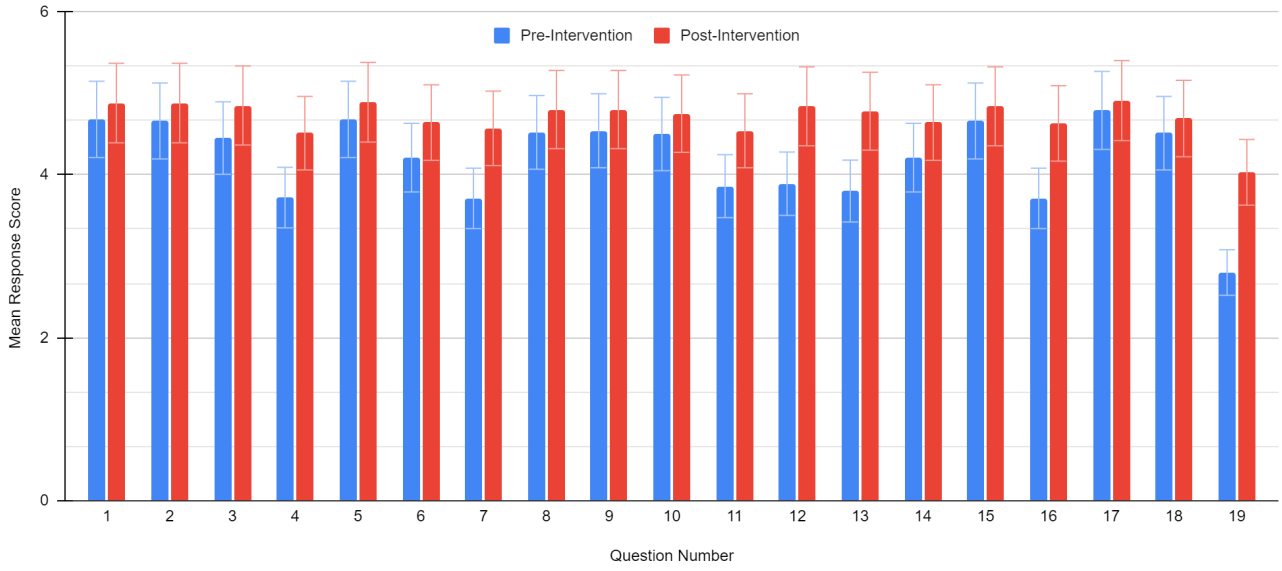

Table 2: Results of a Wilcoxon signed ranks test performed in SPSS, comparing pre- and post-intervention median response scores, with h0 = no difference in median score and h1 = true difference in median score. Based on the test statistics, it can be said that there is a significant positive difference in the medians (Z = -3, one-tailed p = 0.003) post-intervention as compared to pre-intervention (99.7% CI [4,5]). Effect size r = -0.69, which corresponds with a large positive effect.

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum	Percentiles 25th	50th (Median)	75th
PREMEDIAN	19	4.4737	.61178	3.00	5.00	4.0000	5.0000	5.0000
POSTMEDIAN	19	4.9474	.22942	4.00	5.00	5.0000	5.0000	5.0000

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
POSTMEDIAN - PREMEDIAN	Negative Ranks	0[a]	.00	.00
	Positive Ranks	9[b]	5.00	45.00
	Ties	10[c]		
	Total	19		

a. POSTMEDIAN < PREMEDIAN

b. POSTMEDIAN > PREMEDIAN

c. POSTMEDIAN = PREMEDIAN

Test Statistics[a]

	POSTMEDIAN - PREMEDIAN
Z	-3.000[b]
Asymp. Sig. (2-tailed)	.003

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

Discussion:

Why Wilcoxon Analysis? The Wilcoxon signed rank test is a nonparametric test, which means it does not assume that the data will be normally distributed. This kind of test is used for comparing sets of ordinal, or ranked, data, such as that collected using the 1 through 5 scoring system in this study. The Wilcoxon signed rank test is used specifically for qualitative data that is also matched, as in this case where students were asked the same questions twice, before and after the presentation. It uses the median, instead of the mean, as a measure of central tendency, since the median is less affected by outliers.

Limitations - Surveys used in this study had a high response rate, with only 6 participants (5.4% of students who filled out the initial survey) failing to respond to the post-intervention survey. The scope of the curricular intervention was limited by time constraints placed on both presentations (45 minutes for the formal didactic version, 90 minutes for the discussion-based small-group version); despite greater time being allotted for the small-group session, many of the discussion prompts and videos included for students' benefit had to be skipped in order to adequately cover the core content of the presentation. The final data may be affected by use of self-reporting to gather data as opposed to an objective written assessment of student knowledge (i.e. an examination); however, because the didactic version of the presentation was given as an introduction to a longer lecture series on transgender health, allowing students to self-report their understanding of this specific talk's learning objectives likely prevented confounding that may have been present had students been administered an examination following the lecture series. Results are only representative of students in the pre-clinical phase of training, as for the purposes of this study it was not possible to assess students in the clinical phase.

Conclusions:

- Survey responses indicate that, subjectively, pre-clinical medical students found the Transgender Health 101 talk to be beneficial to their understanding of transgender healthcare and transgender social issues, despite self-reporting a moderate degree of understanding of these topics beforehand.
- Statistical analysis indicates that, objectively, students' self-reported understanding of the talk's learning objectives overall was significantly higher after participating in the talk, with the greatest improvements being seen on the topics of transgender social issues, barriers to care for transgender patients, gender-affirming medical interventions, and how to make a trans person feel comfortable during an interaction.
- Prior to the talk, students did not feel that their medical training was adequately preparing them to work with transgender patients; however, after participating in the talk, students felt much more prepared to work with this population.
- Though not a statistically-significant increase, students also reported feeling more interested in learning more about transgender healthcare and social issues after the presentation than they did beforehand.
- Overall, the didactic had a significant effect on students' self-reported understanding of transgender health, social issues, and cultural competency, and based on this it is suggested that all preclinical medical students be provided with such a multidisciplinary curriculum informed by transgender lived experience, in order to prepare them to work with transgender patients during their clinical years.

You can access the “Transgender Health 101” curriculum by following the QR code link below:

Works Cited:

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