

1 **Title page:**

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3 **Physiotherapy students' education on, exposure to, and attitudes and beliefs about**
4 **providing care for LGBTQIA+ patients: a cross-sectional study in the UK**

5
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26

1 **Abstract**

2
3 **Background:** Individuals who identify as lesbian, gay, bisexual, transgender, queer, intersex,
4 asexual or related identities (LGBTQIA+) experience barriers when accessing healthcare,
5 including physiotherapy. Little is known about physiotherapy students' attitudes and beliefs
6 about caring for LGBTQIA+ individuals and what education is provided. **Purpose:** This
7 study aims to identify the attitudes, knowledge and practice of physiotherapy students when
8 caring for LGBTQIA+ patients in a UK context. **Methods:** A cross-sectional online survey of
9 physiotherapy students. Independent sample t-tests and an analysis of variance were carried
10 out to analyse between-group differences in heteronormativity scores (modified
11 Heteronormative Attitudes and Beliefs Scale (HABS)) and respondents' attitudes and beliefs
12 about caring for LGBTQIA+ individuals. **Results:** 107 eligible participants completed the
13 questionnaire with 23% identifying as LGBTQIA+ and 41% indicating close personal
14 exposure to LGBTQIA+ people. Clinical placement experience and experience working with
15 LGBTQIA+ people in other professional roles was reported by 16%, 27% respectively.
16 Educational exposure (with a mean (standard deviation (SD)) of 2.7 (2.9) hours) to the
17 LGBTQIA+ community was reported by 17% of participants. The overall mean (SD)
18 modified-HABS score was 2.65 (1.20). Participants with greater personal and informal
19 educational exposure to the LGBTQIA+ topics demonstrated less heteronormative attitudes
20 and beliefs, greater awareness and more inclusive attitudes towards caring for LGBTQIA+
21 individuals compared to those without. **Conclusion:** Physiotherapy students have generally
22 positive attitudes towards providing care for LGBTQIA+ individuals. Education is
23 inconsistent and physiotherapy students lack awareness of LGBTQIA+ specific healthcare
24 needs. These findings suggest that more focus is needed on LGBTQIA+ healthcare within
25 physiotherapy education.

26
27 **Keywords**

28 *Physiotherapy, healthcare students, higher education, LGBTQIA+, heteronormativity.*
29
30

1 Introduction

2
3 There is increasing awareness of the need for equitable healthcare access and treatment for
4 individuals who identify as lesbian, gay, bisexual, transgender, queer/questioning, intersex,
5 asexual or a related identity (LGBTQIA+).^{1,2} LGBTQIA+ individuals experience both mental
6 and physical health disparities, including a higher prevalence of mental health conditions,
7 suicide, asthma, HIV and certain cancers than the general population.³⁻⁵ Additionally, a high
8 prevalence of negative health behaviours has been recorded in the LGBTQIA+ community,
9 such as delaying and discontinuing care, high rates of smoking, and alcohol and substance
10 misuse.^{3,6}

11
12 Individuals who identify as LGBTQIA+ experience many barriers to accessing healthcare.
13 Discrimination by healthcare professionals (HCPs) is prevalent, with service users' prior
14 negative healthcare experiences and fear of discrimination contributing to non-disclosure of
15 gender identity and sexual orientation.⁶⁻¹¹ HCPs' knowledge on specific LGBTQIA+
16 healthcare needs and inequalities is inadequate, and patients frequently report a need to
17 personally educate their HCPs, which can result in a breakdown of trust.¹²⁻¹⁴ Additionally,
18 heteronormativity and cisnormativity, the assumptions that all people are, by default,
19 heterosexual and cisgender, are pervasive in healthcare.^{13,15} These can lead to feelings of
20 invisibility, patient frustration, and a worsened therapeutic relationship.^{6,11,16,17} Research
21 exploring LGBTQIA+ experiences in physiotherapy has shown similar barriers, with patients
22 reporting misgendering by physiotherapists and discomfort due to the close physical nature of
23 physiotherapy encounters, in addition to the discrimination and lack of knowledge seen in other
24 healthcare settings.¹⁷ Similarly, physiotherapy spaces are not perceived as inclusive by
25 LGBTQIA+ physiotherapists and patients alike. LGBTQIA+ patients are strongly supportive
26 of physiotherapists receiving LGBTQIA+ specific education.^{17,18}

27
28 Understanding the attitudes and beliefs of healthcare students towards LGBTQIA+ patients,
29 and their awareness of LGBTQIA+ healthcare needs, may be useful in determining whether
30 students are adequately prepared to provide sensitive care for LGBTQIA+ patients. Studies of
31 healthcare students from a range of disciplines have mixed results, with some highlighting
32 discriminatory behaviours by medical¹² and nursing students,⁸ while Nowaskie *et al.* found
33 health and social care students in a number of disciplines to have affirming attitudes.⁷ Most
34 studies reveal clinical unpreparedness of students.^{7,19} Education on LGBTQIA+ healthcare
35 needs remains inconsistent,^{7,9,20} despite evidence to suggest that training is effective in
36 improving students' attitudes, knowledge and confidence.^{7,21-23} Two studies on LGBTQIA+
37 teaching for United States of America (USA) physiotherapy students reveal that this is not
38 provided consistently and that students receive less than two hours of curricular teaching per
39 year.^{7,24}

40
41 This research follows on from a new, unpublished, international study into the attitudes,
42 knowledge and practice of qualified physiotherapists in caring for LGBTQIA+ individuals.²⁵
43 To our knowledge, no prior research has been conducted which explores United Kingdom (UK)
44 physiotherapy students' attitudes and beliefs towards providing care for LGBTQIA+
45 individuals. Accordingly, this study will provide new insight into UK physiotherapy students'
46 education on LGBTQIA+ healthcare, their experience working with LGBTQIA+ individuals,
47 the extent to which they have heteronormative beliefs, and their attitudes and beliefs about
48 providing care for LGBTQIA+ patients.

1 **Methods**

2
3 A cross-sectional survey of physiotherapy students in the UK was undertaken to address the
4 research objectives. This study was conducted through one university in South East England.
5 All data collection occurred between January and March 2021.
6

7 The study was approved by St. George's University of London Research Ethics Committee
8 (REC Reference Number: 2020.0346).
9

10 **Sampling**

11 Participants were invited to complete an anonymous online questionnaire. Convenience
12 sampling was used to recruit a sample from the population of interest,²⁶ via student networks
13 and social media. Snowballing was encouraged. To be eligible for inclusion into the study,
14 participants had to be enrolled in a physiotherapy undergraduate or postgraduate programme
15 in the UK at the time of completing the questionnaire. No other inclusion or exclusion criteria
16 were set. Assuming a power of 0.95 and a 5% margin of error, an a priori sample size of n=84
17 was calculated based on existing literature,²⁷ to detect a small to medium (effect size = 0.3)
18 difference between heterosexual and non-heterosexual participants on overall HABS score.
19

20 **Questionnaire**

21 An online questionnaire was developed using Microsoft Forms and included demographic
22 information, exposure to LGBTQIA+ people, heteronormative attitudes and beliefs and
23 participants' awareness, self-rated competence and attitudes and beliefs about providing care
24 to LGBTQIA+ people.
25

26 Questions were used to elicit the participants exposure to LGBTQIA+ people either through
27 personal relationships (i.e., self-identify, family, close friend etc) or clinical or professional
28 experience (i.e., clinical placement during physiotherapy training or previous professional role)
29 or university education on LGBTQIA+ healthcare. Those participants who had had clinical or
30 professional experience were given the option to provide more details about this experience in
31 an open text field. Questions were based on a literature search of LGBTQIA+ content in
32 healthcare education.^{7,22,23,29} An open-ended question to elicit how students want LGBTQIA+
33 teaching to be integrated into their course was included.
34

35 To evaluate individual tendencies to heteronormative attitudes and beliefs the 16-item
36 Heteronormative Attitudes and Beliefs Scale (HABS)³⁰ was used. The HABS³⁰ contains two
37 subscales: the essential sex and gender (ESG) subscale (items: 1-9) and the normative
38 behaviour (NB) subscale (items: 10-17). To elicit participants' awareness of the existence of
39 more than two genders we modified the HABS by adding an item to the ESG subscale (see
40 **Supplemental File 1** for the final scale and full questionnaire). Participants are asked to
41 agree/disagree with statements on a 7-point Likert scale. An overall modified HABS score was
42 calculated by adding scores 1 (strongly disagree) to 7 (strongly agree) with statements
43 reflecting heteronormative beliefs (and reverse coding was applied to negatively worded
44 items). Means were calculated by dividing total scores by the number of items in the scale and
45 subscales. Higher scores indicate greater endorsement of heteronormative beliefs.
46

47 Participants' awareness, self-rated competence, as well as attitudes and beliefs about providing
48 physiotherapy care to LGBTQIA+ patients were measured on a 5-point Likert scale (see
49 **Supplemental File 2**). These questions were adapted with permission from Ross *et al.* for the
50 student population.²⁵

1 Eligible participants were provided with information about the study prior to giving their
2 informed consent via the first question on the Microsoft Forms questionnaire. All data collected
3 was anonymised.
4

5 **Data analysis**

6 Data analysis was primarily quantitative and was conducted using SPSS v27. Descriptive
7 statistics, namely frequency tables and percentages, were used to describe the sample
8 population and compare differences in response distributions across groups, based on personal,
9 clinical, professional exposure and education. Inferential statistics (analysis of variance and
10 independent-samples-t-tests) were completed to analyse between-group differences for the
11 modified HABS scores. Statistical significance was set at $p < 0.05$.
12

13 Grouping was used to facilitate data analysis. Responses were grouped using personal, clinical
14 or professional and educational (formal and informal) exposure to LGBTQIA+ people. For
15 personal relationships, respondents were categorised based on their strongest relationship
16 (listed in descending order): (1) “I identify” as LGBTQIA+; (2) a “close” relationship with
17 either a family member or close friend identifying as LGBTQIA+; (3) a “distant” relationship
18 with a colleague/peer identifying as LGBTQIA+; or (4) “none” with no relationship to anyone
19 who identifies as LGBTQIA+. For clinical or professional experiences caring for, or working
20 with LGBTQIA+ individuals, responses were categorised as (1) “No” or (2) “Not Sure” and
21 (3) “Yes” (for analysis “No” and “Not sure” were combined, as it was reasoned that
22 respondents must be aware of their interactions with LGBTQIA+ individuals for this to affect
23 attitudes and beliefs). For educational exposure, responses were categorised as (1) “No” or (2)
24 “Yes”.
25

26 A missing value analysis was completed. Missing data formed less than 1% of our total data
27 and the pattern was random. Where a participant did not answer a question, the response was
28 excluded from the statistical analysis. To calculate the modified HABS scores, we required all
29 questions to be answered. Only two respondents failed to answer all of the questions and their
30 response to individual items in the scale were excluded from analysis.
31

32 Responses to open-ended questions (**data available on request**), used to contextualise the
33 quantitative findings, were analysed qualitatively using content analysis.³¹
34

35 **Results**

36 **Demographics**

37 A total of 107 responses were obtained from eligible participants. According to data available³²
38 the total UK student population was estimated as 7500, meaning a 1.4% response rate.
39 Participants were primarily in their twenties, women, heterosexual and studying in England.
40 Full demographic details are listed in **Table 1**. A quarter of respondents identified with a sexual
41 orientation other than heterosexual ($n=27$, 25.1%) and 11.2% ($n=12$) reported their gender
42 identity to be different to their sex assigned at birth.
43
44

45 **Exposure to the LGBTQIA+ community**

46 *Personal*

47 Twenty-five (23.4%) participants identified as LGBTQIA+. Forty-one percent reported a close
48 relationship with someone who identifies as LGBTQIA+, 15.9% reported a distant relationship,
49 and 19.6% had no relationship with LGBTQIA+ individuals (**Table 1**).
50

51 *Clinical or professional*

1 Contact with an LGBTQIA+ patient on clinical placements was reported by 16% (n=17) of
2 participants. Eighty-nine (84%) reported either having had no contact or being unsure whether
3 they had contact with an LGBTQIA+ patient during placement. From the open responses, the
4 number of interactions with LGBTQIA+ patients ranged between 1 and 4, with the majority
5 (47%, n=8) recalling only one.

7 Professional experience working with LGBTQIA+ individuals outside of their physiotherapy
8 training (e.g. as a receptionist or teacher) was reported by 27% (n=29) of participants. The
9 majority (n=77, 72%) reported either having had no professional experience or being unsure.
10 From the open responses, the type and extent of professional experience varied widely,
11 including experience in both healthcare and non-healthcare settings. Some reported a single
12 interaction with an LGBTQIA+ person and others reported several years of regular contact
13 **(data available on request)**.

14 *Educational*

16 The majority of respondents (n=88, 83%) had not received any formal LGBTQIA+ specific
17 education during their physiotherapy programs. Those who did reported a total duration
18 ranging from two minutes to 10 hours, with a mean (SD) of 2.70 (2.861). Education was most
19 frequently provided through small group discussions (67%), lectures (50%), guest speakers
20 who identify as LGBTQIA+ (28%) or practical sessions (28%). A large proportion (n= 89,
21 84%) reported utilising informal education to learn more about the LGBTQIA+ community.

23 There were 70 responses to the open-ended question enquiring how LGBTQIA+ specific
24 content could be delivered at university. Many participants (n=59, 84%) felt that some form of
25 teaching on LGBTQIA+ healthcare needs should be delivered, expressing positive attitudes
26 towards such teaching. However, 11% (n=8) of the respondents did not feel LGBTQIA+
27 teaching should be delivered or expressed more negative attitudes. Four percent (n=3) were
28 unsure about how or whether teaching should be delivered **(data available on request)**.

30 **Heteronormative Attitudes and Beliefs Scale**

31 The mean (SD) overall modified HABS score was 2.65 (1.20) and 3.17 (1.47) and 2.05 (1.06)
32 for the modified ESG and NB subscales, respectively. Mean (SD) modified HABS, modified
33 ESG and NB subscales for each type of exposure to the LGBTQIA+ community are reported
34 in **Table 2**. Participants with greater personal exposure to the LGBTQIA+ community (i.e.,
35 identifying as LGBTQIA+ or a close relationship with someone who does) demonstrated
36 significantly lower modified-HABS scores, ESG and NB subscales) compared to those with a
37 distant relationship or no relationship (**Table 3**). There were no differences between groups
38 those with and without clinical, professional or formal educational exposure to the LGBTQIA+
39 community (**Table 3**). Participants who reported utilising informal education to learn about the
40 LGBTQIA+ community (independent to formal physiotherapy education) demonstrated
41 significantly lower modified HABS scores (for total, ESG and NB subscales) (**Table 3**).

43 **Providing physiotherapy care for LGBTQIA+ patients**

44 The overall responses to this section of the questionnaire are displayed in **Figure 1**. Responses
45 to each question were evaluated using groups, based on personal, clinical or professional and
46 educational exposure to the LGBTQIA+ community (as per the HABS questionnaire). The
47 following sections outline these findings.

49 *Personal exposure*

50 Participants with a closer relationship reported greater awareness and competency, and more
51 inclusive attitudes towards LGBTQIA+ people and their healthcare needs (**Supplemental File**
52 **3**). For example, a greater proportion of participants who identify as LGBTQIA+ (88%)

1 disagreed that LGBTQIA+ people do not have specific healthcare needs, compared to those
2 with more distant relationships (**Supplemental File 3**). Fewer participants with no relationship
3 (73.7%) strongly disagreed with the statement “I would prefer not to provide care...” compared
4 to LGBTQIA+ participants (100%).

5 6 *Clinical or professional exposure*

7 A larger number of participants who had clinical placement experience providing
8 physiotherapy care to an LGBTQIA+ patient (88.3%) reported awareness that LGBTQIA+
9 patients have specific healthcare needs, compared to those without experience (61.4%)
10 (**Supplemental File 3**). Participants with professional experience were more likely to strongly
11 agree (75.9%) that they would feel able to communicate sensitively with an LGBTQIA+
12 patient, compared to 50% of those without. For statements about education as well as skill and
13 attitude development, fewer participants with experience strongly agreed (31-37.9%) with
14 these statements compared to those without (57.3- 62.7%).

15 16 *Educational exposure*

17 Overall, whether or not a participant had received formal LGBTQIA+ specific healthcare
18 training did not generate clear differences in responses to questionnaire items focused on self-
19 rated competence and professional development. 77.8% of participants who received
20 LGBTQIA+ teaching strongly disagreed with the statement that they would “prefer not to
21 provide care”, compared to 93% of those who did not receive such training.

22
23 A smaller percentage of those with teaching (44.4%) agreed that gender and sexuality are
24 relevant to physiotherapy consultations than those without (65.9%). There was minimal
25 between group difference in those disagreeing that LGBTQIA+ individuals do not have
26 specific healthcare needs (61.1% with teaching versus 66.6% without).

27
28 Greater differences were found when comparing the responses of those who used informal
29 education to learn about the LGBTQIA+ community with those who had not. The responses
30 for the those that used informal learning demonstrated better awareness and inclusive attitudes.
31 For example, a larger proportion of participants (71.5%) with this additional learning reported
32 an awareness of the specific healthcare needs of LGBTQIA+ people compared to those without
33 (35.3%). Further, more participants utilising informal learning agreed that physiotherapists
34 should educate themselves about the experiences of LGBTQIA+ people (91.9%), use
35 professional development to improve their care (88.5%) and develop relevant skills (93.1%)
36 and attitudes (94.2%) compared to those who had not (52.9-58.8%).

37
38 From the open-ended comments, we found that the majority of physiotherapy students were
39 interested in formal education on LGBTQIA+ related healthcare topics. However, some
40 students expressed negative attitudes towards further training. Some expressed beliefs that
41 sexual orientation and gender identity are not relevant to physiotherapy, and others suggested
42 that tailored care constitutes “special requirements” and should not be promoted.

43 44 **Discussion**

45
46 To our knowledge, this is the first study to examine the attitudes and beliefs of UK
47 physiotherapy students towards providing care for LGBTQIA+ patients. Our results appear to
48 signal more affirmative attitudes than the only previous study on self-reported
49 physiotherapists’ attitudes in 2008 in the USA by Burch³³, where 85% of qualified
50 physiotherapists working with spinal cord injury patients reported they “tolerated” LGBT
51 patients, and only 1% reported “full respect”. This may be due to a shift in societal attitudes
52 towards and acceptance of LGBTQIA+ people over the past decade as well as geographical

1 differences between this study and ours. Additionally, there was a disproportionately higher
2 response rate from LGBTQIA+ students to our survey when comparing this to Chartered
3 Society of Physiotherapy data and broader population estimates.^{32, 34-35} This self-selection bias
4 may have skewed our findings towards better awareness and more inclusive attitudes and
5 beliefs.

6
7 Overall, we found that students did not exhibit strong heteronormative attitudes and beliefs,
8 although around a third of respondents held cisnormative views relating to questions on sex
9 and gender. Both cis- and hetero-normativity have been reported as prevalent in physiotherapy
10 settings,^{17,18} which may suggest that heteronormative attitudes are not challenged and maybe
11 reinforced through exposure to the culture of the physiotherapy and healthcare workplace. It is
12 also possible that these results were influenced by students' (un)familiarity with questionnaire
13 terms. Some participants may be unaware of the difference between "gender" and "sex", which
14 could indicate a lack of culturally sensitive knowledge.

15
16 Despite these largely positive attitudes, our results suggest that a large proportion of students
17 lack awareness of the relevance of sexual and gender identity in physiotherapy practice and
18 LGBTQIA+ specific healthcare needs. For instance, participants may have thought that
19 LGBTQIA+ status is not relevant to physiotherapy consultation and take the view that treating
20 everyone the same leads to equality in their practice. Therefore, it might indicate that students
21 are inadequately equipped with the knowledge required to provide culturally competent and
22 equitable person-centred care. As other studies have shown, when this lack of knowledge
23 persists in qualified physiotherapists' practice, it results in increased stress for LGBTQIA+
24 patients and physiotherapists alike, who feel they have to educate heterosexual and cisgender
25 practitioners.^{6,14,17,18}

26 27 *Impact of education*

28 LGBTQIA+ specific education is not routinely provided in UK physiotherapy education and
29 this study indicates it varies greatly for those who do receive it. The average of two hours of
30 teaching for those receiving training is similar to that reported in US studies, however fewer
31 students in our study received teaching.^{7,24} Our results are consistent, though, with a study of
32 UK medical students, where 84.9% of students did not receive LGBTQIA+ training,³⁶ and may
33 suggest a lack of prioritisation of this topic in UK healthcare education. It is uncertain why this
34 lack of prioritisation might occur, but may be due to lack of training, expertise or hesitancy by
35 academic staff in teaching about LGBTQIA+ healthcare, or perceptions that such education is
36 extracurricular. These uncertainties warrant further exploration and this work is forthcoming.

37
38 LGBTQIA+ specific teaching did not correspond with increased awareness of, or self-rated
39 competence to provide care for LGBTQIA+ individuals, nor was it associated with less
40 heteronormative attitudes and beliefs. Although the evidence to support LGBTQIA+ healthcare
41 education's effect on attitudes is equivocal,^{37,38} there is strong evidence to suggest it is effective
42 in improving knowledge, clinical readiness and confidence amongst students from a variety of
43 disciplines, including physiotherapy.^{7,21,37,39} One explanation for our contrasting findings may
44 be the low volume of teaching, with it suggested elsewhere that 35 hours of LGBTQIA+
45 teaching is required for achieving high cultural competence.⁴⁰ Alternatively, this result may be
46 explained by the teaching quality and content, which were not measured in our study. While
47 an expectation of 35 hours may be ambitious in a 3-year Bachelor degree or 2-year pre-
48 registration Masters degree, there is scope for educators to consider how and when students
49 learn about LGBTQIA+ healthcare. For instance, where students learn about building
50 therapeutic relationships more explicit discussion around gender and sexual diversity should
51 take place.

1 Very few students agreed that their current education on LGBTQIA+ healthcare was adequate
2 and most relied on informal learning to increase their awareness. Participating in informal
3 learning was associated with less heteronormative attitudes, better awareness and more
4 inclusive attitudes towards providing physiotherapy care for LGBTQIA+ patients. These
5 findings appear to provide more support for the benefits of further education in this area,
6 however the direction of this relationship is unknown. It may instead reflect that students with
7 better awareness of LGBTQIA+ healthcare are more likely to engage in self-directed learning.
8 Furthermore, it might suggest learning prompted by personal motivation rather than enforced
9 through formal education might be more advantageous, however there are risks that
10 discriminatory attitudes may go unchallenged.

11 *Impact of clinical and professional exposure*

12 Respondents who reported having had clinical or professional contact with LGBTQIA+
13 individuals reported slightly better awareness and some favourable attitudes towards providing
14 care for LGBTQIA+ patients. However, these findings were not consistent across the
15 physiotherapy specific questions. Surprisingly, those with professional exposure reported less
16 favourable attitudes regarding the need for training and development to provide effective care
17 to LGBTQIA+ patients. A possible explanation for these inconsistent findings may be that the
18 volume of exposure was not sufficient to result in consistent improvements in awareness, self-
19 rated competence and attitudes towards providing care for LGBTQIA+ patients. Nowaskie and
20 Patel suggested that medical students should acquire a minimum of 35 LGBT patient contacts
21 alongside their educational hours in order to achieve a high level of cultural competence.⁴⁰
22 None of the respondents in our study acquired this level of clinical exposure but this may be
23 due to the varying year levels and lack of opportunity. Nevertheless, this volume of clinical
24 exposure may not be possible in physiotherapy placements where placement hours are
25 significantly less than in medicine. Further research may be warranted to investigate the
26 relationship between exposure in professional contexts and physiotherapy students' attitudes
27 and competence.

28 *Impact of identity*

29 Respondents who identify as LGBTQIA+ reported less heteronormative attitudes and beliefs
30 than those that did not identify as LGBTQIA+, a result that has similarly been seen in studies
31 utilising the HABS on US college students and UK social workers.^{27,41} LGBTQIA+
32 participants also showed better self-rated competence, awareness and favourable attitudes and
33 beliefs about providing care for LGBTQIA+ patients, including the need for more training and
34 development to provide effective care for LGBTQIA+ patients. Similar findings were reported
35 in previous studies where LGBQ students were significantly more likely to be interested in
36 further training on LGBTQIA+ healthcare and significantly less likely to agree that such
37 training was currently effective.^{7,19} This may be obvious as groups that are marginalised in
38 society are more acutely aware of what interventions may be more or less effective.⁴²
39 Secondly, these results complement previous findings by Ross and Setchell where LGBTQIA+
40 patients were strongly in support of physiotherapists receiving training on LGBTQIA+
41 healthcare.¹⁷

42 *Impact of personal exposure*

43 Participants with personal exposure to the LGBTQIA+ community reported less
44 heteronormative attitudes and beliefs as well as greater awareness and more favourable
45 attitudes towards providing physiotherapy care for LGBTQIA+ patients, compared to those
46 who had no exposure to, or contact with, LGBTQIA+ people. Those with a closer relationship
47 showed more favourable attitudes and less heteronormative beliefs than those with only distant
48 contact. Research has consistently found that between group contact reduces intergroup
49 prejudice and increases healthcare students' preparedness to work with diverse patient
50 groups.^{38, 43-45} Our results complement these existing findings and highlight that intergroup
51
52

1 contact may play an important role in fostering inclusive attitudes and beliefs about
2 LGBTQIA+ individuals and their specific healthcare needs in physiotherapy settings. While
3 recruitment strategies that are more LGBTQIA+ inclusive may be advantageous, there are other
4 implications for higher education institutions. Educators are encouraged to develop teaching
5 and learning strategies that provide safe spaces for respecting diversity, facilitate greater
6 intergroup contact and possibly serve to disrupt the hetero- and cisnormative culture in
7 physiotherapy settings.

9 **Limitations**

10 The study is limited by its small sample size and response rate which may reduce the
11 generalisability of the findings to a wider UK or international physiotherapy student
12 population. Compared to the wider UK physiotherapy student population, our sample had a
13 noticeably higher proportion of BSc students, women and students over the age of 25.³²
14 Furthermore, non-response bias may have impacted analysis of the open-ended question as
15 not all participants responded to those questions. There is also a possibility that participants
16 with strong views (either LGBTQIA+ inclusive or heteronormative) were more likely to
17 respond, potentially impacting the range of findings. Social desirability may also have
18 influenced students' responses since this may be considered a sensitive topic. However, this
19 was likely reduced through anonymisation of the survey.⁴⁶ There is also some difficulty in
20 translating the findings beyond the UK context due to cultural, legal and regulation
21 differences so readers are encouraged to consider the findings in relation to their own context.

22
23
24 The small sample size also meant that sexual and gender minorities were grouped to enable
25 meaningful statistical analysis. Significant intra-group differences exist in LGBTQIA+
26 individuals' lived experiences and healthcare needs. Furthermore, attitudes towards different
27 groups within the LGBTQIA+ community may also vary, as is indicated by the stark
28 differences in discrimination faced by cisgender LGBQ compared to transgender individuals.⁴⁷

29
30 The cross-sectional design means causal links cannot be drawn and links with other variables,
31 such as demographics, were not controlled for. However, our results fit into the wider context
32 of LGBTQIA+ healthcare education and healthcare students' attitudes and beliefs as is
33 described in the discussion.

34 **Future research**

35
36 Our study relied on students' personal recall of LGBTQIA+ healthcare teaching during their
37 physiotherapy training to date, which may have resulted in an imprecise portrayal of the amount
38 of teaching provided. Future research aimed at UK physiotherapy programme directors, as
39 recently carried out in the USA,²⁴ may be beneficial in corroborating our findings, enhance
40 understanding of barriers to including LGBTQIA+ specific teaching, and further examine the
41 content of teaching. In other healthcare disciplines teaching often focuses heavily on topics
42 such as HIV and sexually transmitted diseases, and coverage of issues impacting trans patients
43 is especially poor.^{9,20,29} Understanding the content of physiotherapy LGBTQIA+ teaching may
44 help identify why it is currently ineffective in improving attitudes, awareness and self-rated
45 competence.

46
47 This study only measured students' explicit attitudes and beliefs about providing care to
48 LGBTQIA+ patients. Research has shown that implicit bias may lead to HCPs exhibiting
49 discriminatory and prejudiced behaviours towards members of minority groups, even in the
50 absence of explicit bias, and it thereby partially accounts for the disparities in care quality and
51 outcomes experienced by minority populations.^{48,49} Investigating physiotherapy students'
52 implicit bias towards LGBTQIA+ individuals may be an important area for further study.

1 While challenging, this could be explored by comparing student responses to LGBTQIA+
2 inclusive versus heteronormative case scenarios, or reflecting on their competence to manage
3 real clinical situations involving LGBTQIA+ patients.
4

5 **Conclusion**

6 This is the first known study to investigate UK physiotherapy students' education on, their
7 experience working with and their attitudes and beliefs about LGBTQIA+ patients. Students
8 mostly had positive attitudes towards providing care for LGBTQIA+ patients, however many
9 showed poor awareness of their specific healthcare needs. Based on the findings of this study,
10 current training on LGBTQIA+ healthcare is minimal, and does not appear to improve UK
11 physiotherapy students' awareness, attitudes or self-rated competence towards providing care
12 for LGBTQIA+ patients. Both LGBTQIA+ students and respondents with personal contact
13 with LGBTQIA+ people reported lower heteronormative attitudes and beliefs, more awareness,
14 and favourable attitudes towards providing care for LGBTQIA+ patients.
15

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19 reviewed the analysis and subsequent drafts.
20

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23

24 **Declaration of Interests Statement**

25 No conflicts of interest to declare.
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References

1. World Health Organisation. Addressing the causes of disparities in health service access and utilization for lesbian, gay, bisexual and transgender (LGBT) persons. [Internet]. Geneva, Switzerland 2013 [cited 2021 May 25]. Available from: https://www.who.int/hiv/pub/populations/lgbt_paper/en/.
2. Equality Act 2010 [Internet]. 2010 [cited 2020 Nov 26]. Available from: <https://www.legislation.gov.uk/ukpga/2010/15/contents>.
3. Institute of Medicine (IOM). The health of lesbian, gay, bisexual, and transgender people: Building a foundation for better understanding. Washington, DC: National Academies Press (US); 2011. 10.
4. Dearing RL, Hequembourg AL. Culturally (in) competent? Dismantling health care barriers for sexual minority women. *Soc Work Health Care*; 2014. 53(8):739-761.
5. Centers for Disease Control and Prevention (2020) HIV and Gay and Bisexual Men [Internet]. 2020 [cited 2020 Nov 26]. Available from: <https://www.cdc.gov/hiv/group/msm/index.html>.
6. Lee A, Kanji Z. Queering the health care system: Experiences of the lesbian, gay, bisexual, transgender community. *Can J Dent Hyg*; 2017. 51(2):80-89.
7. Nowaskie DZ, Patel AU, Fang RC. A multicentre, multidisciplinary evaluation of 1701 healthcare professional students' LGBT cultural competency: Comparisons between dental, medical, occupational therapy, pharmacy, physical therapy, physician assistant, and social work students. *PloS One*; 2020. 15(8): e0237670.
8. Eliason MJ, DeJoseph J, Dibble S, Deevey S, Chinn P. Lesbian, gay, bisexual, transgender, and queer/questioning nurses' experiences in the workplace. *J Prof Nurs*; 2011. 27(4):237-244.
9. Eliason MJ, Dibble SL, Robertson PA, Lesbian, gay, bisexual, and transgender (LGBT) physicians' experiences in the workplace. *J Homosex*; 2011. 58(10):1355-1371.
10. Somerville C. Unhealthy Attitudes: The Treatment of LGBT People Within Health and Social Care Services [Internet]. London, UK: Stonewall; 2015 [cited 2020 November 26]. Available from: https://www.stonewall.org.uk/system/files/unhealthy_attitudes.pdf.
11. Meads C, Hunt R, Martin A, Varney J. A systematic review of sexual minority women's experiences of health care in the UK. *International journal of environmental research and public health*. 2019. 16(17):3032.
12. Dudar KJ, Ghaderi G, Gallant J, Dickinson J, Abourbih J, Briggs M. Queering the medical curriculum: how to design, develop, deliver and assess learning outcomes relevant to LGBT health for health care professionals. *MedEdPublish*; 2018;7.
13. Bauer GR, Hammond R, Travers R., Kaay M, Hohenadel KM, Boyce M. I don't think this is theoretical; this is our lives: how erasure impacts health care for transgender people. *J Assoc Nurses AIDS Care*; 2009. 20(5):348-361.
14. Floyd MJ, Martin O, Eckloff K.J. A qualitative study of transgender individuals' experiences of healthcare including radiology. *Radiography*; 2020 26(2):38-44.
15. McCann E, Brown M. The inclusion of LGBT+ health issues within undergraduate healthcare education and professional training programmes: A systematic review. *Nurse Educ Today*; 2018. 64:204-214.
16. Enson, S. Causes and consequences of heteronormativity in healthcare and education. *British J Sch Nurs*; 2015 10(2):73-78.
17. Ross MH, Setchell J. People who identify as LGBTIQ+ can experience assumptions, discomfort, some discrimination, and a lack of knowledge while attending physiotherapy: a survey. *J Physiother*; 2019. 65(2):99-105.
18. Ross MH, Hammond JA, Bezner J, Brown D, Wright A, Chipchase L, Miciak M, Whittaker J, Setchell J. An Exploration of the Experiences of Physical Therapists Who Identify as LGBTQIA+: Navigating Sexual Orientation and Gender Identity in Clinical,

- 1 Academic, and Professional Roles, Physical Therapy; 2021. Available from:
2 [doi:10.1093/ptj/pzab280](https://doi.org/10.1093/ptj/pzab280)
- 3 19. Greene MZ, France K, Kreider EF, Wolfe-Roubatis E, Chen K.D, Wu A, Yehia BR.
4 Comparing medical, dental, and nursing students' preparedness to address lesbian, gay,
5 bisexual, transgender, and queer health. *PloS One*; 2018. 13(9):e020410. Available from:
6 [doi:10.1371/journal.pone.0204104](https://doi.org/10.1371/journal.pone.0204104)
- 7 20. Hillenburg KL, Murdoch-Kinch CA, Kinney JS, Temple H, Inglehart MR. LGBT
8 coverage in US dental schools and dental hygiene programs: results of a national survey. *J*
9 *Dent Educ*; 2016. 80(12):1440-1449.
- 10 21. McEwing E. Delivering culturally competent care to the lesbian, gay, bisexual, and
11 transgender (LGBT) population: Education for nursing students. *Nurse Educ Today*; 2020.
12 94:104573.
- 13 22. Gibson, AW. A Novel Curriculum for Medical Student Training in LGBTQ Healthcare:
14 A Regional Pathway Experience. *J Med Educ Curric Dev*; 2020. 7:1-7.
- 15 23. Salkind J, Gishen F, Drage G, Kavanagh J, Potts HW. LGBT+ health teaching within the
16 undergraduate medical curriculum. *Int J Environ Res Public Health*; 2019. 16(13):2305.
- 17 24. Glick, JC, Leamy, C, Molsberry, AH, Kerfeld, CI. Moving Toward Equitable Health
18 Care for Lesbian, Gay, Bisexual, Transgender, and Queer Patients: Education and Training in
19 Physical Therapy Education. *J Phys Ther Educ*; 2020. 34(3):192-197.
- 20 25. Ross MH & Setchell J. Enhancing physiotherapy care for individuals who identify as
21 lesbian, gay, bisexual, transgender, intersex, queer and related identities (LGBTIQ+);
22 2021(Unpublished report).
- 23 26. Etikan I, Musa SA, Alkassim RS. Comparison of convenience sampling and purposive
24 sampling. *Am J Theor Appl Stat*; 2016. 5(1):1-4.
- 25 27. Schaub J, Willis P, Dunk-West P. Accounting for self, sex and sexuality in UK social
26 workers' knowledge base: Findings from an exploratory study. *Br J Soc Work*; 2017.
27 47(2):427-446.
- 28 28. The Chartered Society of Physiotherapy. Annual Quality Review - UK pre-registration
29 physiotherapy education. [Internet]. 2020 [cited 2020 November 16]. Available from:
30 [https://www.csp.org.uk/publications/annual-quality-review-uk-pre-registration-](https://www.csp.org.uk/publications/annual-quality-review-uk-pre-registration-physiotherapy-education)
31 [physiotherapy-education](https://www.csp.org.uk/publications/annual-quality-review-uk-pre-registration-physiotherapy-education)
- 32 29. Obedin-Maliver J, Goldsmith ES, Stewart L, et al. Lesbian, gay, bisexual, and
33 transgender-related content in undergraduate medical education. *JAMA*; 2011. 306(9):971-
34 977.
- 35 30. Habarth JM. Development of the heteronormative attitudes and beliefs scale. *Psychol*
36 *Sex*; 2015. 6(2): 166-188.
- 37 31. Vaismoradi M, Turunen H, and Bondas T. Content Analysis and Thematic Analysis:
38 Implications for Conducting a Qualitative Descriptive Study. *Nurs Health Sci*; 2013. 15:398-
39 405. Available at: [doi:10.1111/nhs.12048](https://doi.org/10.1111/nhs.12048)
- 40 32. The Chartered Society of Physiotherapy. Annual Quality Review 2018/19- UK pre-
41 registration physiotherapy education. [Internet]. 2020 [cited 2020 November 16]. Available
42 from: [https://www.csp.org.uk/publications/annual-quality-review-uk-pre-registration-](https://www.csp.org.uk/publications/annual-quality-review-uk-pre-registration-physiotherapy-education)
43 [physiotherapy-education](https://www.csp.org.uk/publications/annual-quality-review-uk-pre-registration-physiotherapy-education)
- 44 33. Burch A. Health care providers' knowledge, attitudes, and self-efficacy for working with
45 patients with spinal cord injury who have diverse sexual orientations. *Phys. Ther*; 2008.
46 88(2):191-198.
- 47 34. Government Equalities Office (GEO). Trans People in the UK. [Internet]. 2018 [cited
48 2021 May 17]. Available from:
49 [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/721642/GEO-LGBT-factsheet.pdf)
50 [/file/721642/GEO-LGBT-factsheet.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/721642/GEO-LGBT-factsheet.pdf)
- 51 35. Office for National Statistics. Sexual Orientation. [Internet]. 2017 [cited 2021 May 25].
52 Available

- 1 from:<https://www.ons.gov.uk/peoplepopulationandcommunity/culturalidentity/sexuality/bulletins/sexualidentityuk/2017>
- 2
- 3 36. Parameshwaran V, Cockbain BC, Hillyard M, Price JR. Is the lack of specific lesbian,
4 gay, bisexual, transgender and queer/questioning (LGBTQ) health care education in medical
5 school a cause for concern? Evidence from a survey of knowledge and practice among UK
6 medical students. *J Homosex*; 2017. 64(3):367-381.
- 7 37. Morris M, Cooper RL, Ramesh A, et al. Training to reduce LGBTQ-related bias among
8 medical, nursing, and dental students and providers: a systematic review. *BMC Med Educ*;
9 2019. 19(1):1-13.
- 10 38. Hunt, R, Bates, C, Walker, S, et al. A systematic review of UK educational and training
11 materials aimed at health and social care staff about providing appropriate services for
12 LGBT+ people. *International Journal of Environmental Research and Public Health*; 2019.
13 16(24):4976.
- 14 39. Pratt-Chapman M, Phillips S. Health professional student preparedness to care for sexual
15 and gender minorities: efficacy of an elective interprofessional educational intervention. *J*
16 *Interprof Care*; 2020. 34(3):418-421.
- 17 40. Nowaskie DZ, Patel AU. How much is needed? Patient exposure and curricular education
18 on medical students' LGBT cultural competency. *BMC Med Educ*; 2020. 20(1):1-8.
- 19 41. Duncan SG, Aguilar G, Jensen CG, Magnusson BM. Survey of heteronormative attitudes
20 and tolerance toward gender non-conformity in Mountain West undergraduate students. *Front*
21 *Psychol*; 2019. 10:793.
- 22 42. Nixon, SA. The coin model of privilege and critical allyship: implications for health.
23 *BMC Public Health*; 2019. 19:1637 Available at [doi:10.1186/s12889-019-7884-9](https://doi.org/10.1186/s12889-019-7884-9)
- 24 43. Pettigrew TF, Tropp LR. A meta-analytic test of intergroup contact theory. *J Pers Soc*
25 *Psychol*; 2006. 90(5):751.
- 26 44. Burke, SE. Do contact and empathy mitigate bias against gay and lesbian people among
27 heterosexual first-year medical students? A report from the medical student CHANGE study.
28 *Acad Med*; 2015. 90(5):645.
- 29 45. Niu NN, Syed ZA, Krupat E, et al. The impact of cross-cultural interactions on medical
30 students' preparedness to care for diverse patients. *Acad Med*; 2012. 87(11):1530-1534.
- 31 46. Krumpal I. Determinants of social desirability bias in sensitive surveys: a literature
32 review. *Qual Quant*; 2013. 47(4):2025-2047.
- 33 47. Bachmann CL, Gooch B. LGBT in Britain: Hate Crime and Discrimination. [Internet].
34 London, UK: Stonewall; 2017 [cited 2021 May 17]. Available from:
35 <https://www.stonewall.org.uk/lgbt-britain-hate-crime-and-discrimination>
- 36 48. FitzGerald C, Hurst S. Implicit bias in healthcare professionals: a systematic review.
37 *BMC Med Ethics*; 2017.18(1):1-18.
- 38 49. Sabin JA, Nosek BA, Greenwald AG, Rivara FP. Physicians' implicit and explicit
39 attitudes about race by MD race, ethnicity, and gender. *J Health Care Poor Underserved*;
40 2009. 20(3): 896

