

Original Paper

The Effect of a Film Viewing Intervention Added to Lectures to Improve University Students' Attitudes toward Sexual and Gender Minorities

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Abstract

The purpose of this study was to examine the effect of a film-viewing intervention added to lectures related to sexual and gender minorities on university students' attitudes toward sexual and gender minorities. We requested undergraduate students enrolled in clinical psychology at a university in Japan, who were attending lectures on sexual and gender minorities, to view a film "Bohemian Rhapsody" which depicts gender and sexual minorities as part of their lectures in 2019. They completed a questionnaire before and after the lecture to measure their impressions of sexual and gender minorities, self-efficacy in interaction, feelings of discomfort, transphobia, and level of acceptance or tolerance of discrimination. Based on the responses of 102 participants whose responses to both surveys were confirmed to be valid, we calculated individual scores for each scale. We further conducted a covariance analysis of the effects in the intervention and control groups, using pre-survey scores as the covariate and post-survey scores as the dependent variable. There was no effect found in the film-viewing intervention added to the lectures on any of the scales. However, participants who had no previous exposure to sexual and gender minorities changed their impressions of them and felt more "familiar" with them after the intervention.

1. Introduction

Sexual and gender minorities are more likely to suffer from discrimination such as verbal harassment from early school life, and the impacts of discrimination are known to be associated with mental health problems in the long run^{1,2}. In this paper, we refer to "sexual minorities" as minorities of sexual orientation such as gay, lesbian, pansexual, and so on, and "gender minorities" refers to gender diverse identities such as trans, transgender, and gender non-conforming identities. Preventing the bullying of sexual and gender minorities in school settings is considered a global challenge, and frameworks and practices to address this issue have been reported³⁻⁵. It is within this conversation of education and awareness of important social issues that this research was conducted in Japan.

In recent years, there have been growing social movements to protect the rights of sexual and gender

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minorities in Japan. A law permitting gender to be officially changed on the family register began in 2003, which requires schools to be sensitive to transgender and gender non-conforming students⁶. The term LGBT (Lesbian, Gay, Bisexual, and Transgender identities) became widely known to the public after an Internet survey about LGBT identities was conducted by a major advertising agency in 2012⁷. In 2015, 37.6% of respondents recognized the term LGBT as a generic term for gender and sexual minorities⁸. In the 2018 version of the same study, 68.5% of the respondents (60,000 people in the age range of 20-59 years) recognized the term LGBT as a generic term for sexual and gender minorities⁸. Same-sex partnerships have also been gradually acknowledged since 2015; for example, several cities offer "partnership certificates" to recognize same-sex relationships. LGBTQX^{†1} issues are not new to Japan and Japan has quite a unique culture when it comes to diverse genders and sexualities. For example, "Miss," "Mr.," "Mrs.," and "Ms." can all be expressed as "...san (or sama)" in Japanese, which is a linguistic culture in which honorific titles are not gender- or marital status-specific. In the pre-modern era, same-sex love and being transgender were perceived as neither a sin nor pathology in Japan. Same-sex love, in particular, was celebrated, shown in the entertainment field and the samurai world⁹.

Nevertheless, with the introduction of western culture after the Meiji era (1868-1912), same-sex acts came to be seen as ethically unfavorable sexual perversions¹⁰, leading to a negative image of same-sex acts as "perverted sexual desire"⁹. Although it is not clear to what extent the influence of western ideology has remained in modern Japan, existing barriers include the fact that same-sex marriage is illegal¹¹, and the change of a gender marker on official documents requires a doctor's diagnosis, a minimum age of 20, and a mandatory physical treatment through gender reassignment surgery¹². Moreover, there are no laws on eliminating discrimination on the grounds of sexual orientation or gender identity, which means that the rights of sexual and gender minorities are not fully guaranteed, and minorities experience disadvantages due to discrimination and prejudice¹³. However, the Science Council of Japan¹⁴ states that "it is crucial that schools, workplaces, and local communities get together to stop discrimination against sexual and gender minorities, and that achieving a better understanding of sexual and gender minorities will be helpful for establishing an inclusive society" (p. 19). Movements raising awareness on sexuality and gender diversity have become more active in various fields including education^{6,15}.

In such a social climate, youth education about sexual and gender minorities from the early stage of education is vital, as they will be the ones to support local communities in the near future. Efforts to promote proper understanding and reduce negative attitudes toward sexual and gender minorities are in progress, including explicitly educating university students who are highly likely to work as interpersonal support professionals. For example, Braun et al.¹⁶ conducted a survey targeting students at a medical university in California, USA, and suggested that attending a 10-week (total of 10 hours) online lecture about transgender identities delivered by instructors and concerned parties improved participants' knowledge of transgender identities and reduced their level of transphobia. To raise awareness of LGBT issues, Taylor et al.¹⁷ conducted a one-hour lecture for medical students in the UK and 1.5 hours of role-playing together with their senior students; this increased participants' competency in consultation with LGBT patients.

When we consider effective education, we have several options. Singh and Hughes¹⁸ argued for the significance of activities that meet diverse people through panel discussions with the parties involved and/or the use of multimedia, in addition to expository educational methods through lectures to teach various issues related to sexual and gender minorities. In Japan, for example, participation of sexual and gender minority guest speakers in classes was reported to reduce discrimination and prejudice effectively in some studies. Listening to the person of concern's story about male same sex love (1.5 hours) significantly reduced the image of "danger" toward gay people in the student group and the adult group¹⁹. In addition, it was reported that the image of "familiarity" was significantly increased in the student group and the adult group. In addition, Maemoto et al.²⁰ showed that 50-minute narratives of guest speakers changed the attitudes of school teachers. According to the study, the impression of "familiarity" was significantly increased, discomfort and difficulty in understanding sexual and gender minorities were significantly

reduced. However, in Japan, where the rights of sexual and gender minorities are not adequately guaranteed, the number of guest speakers who can cooperate in education is limited due to concerns about the risk of disclosing their sexuality. Therefore, it is important to consider effective educational methods that do not rely solely on guest speakers.

In this regard, an educational method that involves the cooperation of a person who can simulate a sexual and/or gender minority as an equivalent to a guest speaker can be considered. This is similar to the method of using the simulated patient in medical education²¹⁾. The simulated patient is a trained person who assumes the role of a patient with specific medical symptoms, concerns, and complaints. Medical and nursing students practice their communication skills with these simulated patients. Education using simulated sexual and/or gender minority patients has also begun in medical and nursing schools^{22,23)}. As far as we can find, there are no educational initiatives in Japan that incorporate simulated sexual and/or gender minority characters. Although not necessarily easy to implement in that it requires actors who are well trained and have a good understanding of the feelings and behaviors of sexual and/or gender minorities, this is a potential educational option.

Furthermore, the interventions, such as using television and films, that are relatively easy to introduce have been reported to be effective. Schiappa et al.²⁴⁾ showed that persons who watched television programs that properly portrayed a gay personality had a positive attitude toward gay people. Madžarević and Soto-Sanfiel²⁵⁾ also reported that viewing films that portray gay people positively reduced homophobia in participants. Similar effects also have been shown for transgender people. Watching TV documentaries including transgender people improved participants' negative attitudes toward transgender people and reduced their beliefs in myths²⁶⁾. It has also been suggested that these video interventions make viewers' attitudes more negative when the content they use portrays sexual and gender minorities negatively²⁷⁾. In sum, it can be said that video viewing intervention is an effective method to change attitudes, emotions such as likes or dislikes, and to improve knowledge and beliefs about sexual and gender minorities.

No studies in Japan have examined the pure effects of TV or film viewing on sexual and gender minorities. Even when TV or film are utilized as part of an educational intervention, they are limited to studies in which the viewing time is limited to less than one-fifth of the total intervention time²⁸⁾ or in which videos were utilized only for a portion of the students who participated in the classes on sexual diversity²⁹⁾. Therefore, further accumulation of data is needed to actively discuss the effects of utilizing film-viewing in Japan.

Regarding licensed curriculum for school teachers and psychologists in Japanese universities, classes to learn about sexual and gender minorities are very few. Therefore, high efficacy education to reduce discrimination and prejudice against sexual and gender minorities is required. We are committed to developing effective interventions to reduce discrimination and prejudice for Japanese students. Therefore, when we planned new classes, we referred to the previous studies that stated that television and films about sexual and gender minorities were effective in reducing discrimination and prejudice. A film-viewing intervention seemed to be a relatively easy way to introduce these issues in the Japanese curriculum. According to the extended contact hypothesis³⁰⁾, not only direct contact but also indirect contact changes negative attitudes to positive ones toward any group. Watching TV programs and reading stories are reported to have similar effects on changing attitudes^{24,31)}. Due to the previous results found in this research, it is meaningful to verify the effects in Japanese students as well.

This study aimed to reveal the effects on Japanese university students of viewing a film depicting intimate relationships between a main character who is a sexual minority and their friends. We took "Bohemian Rhapsody" as a film-viewing intervention. We chose this movie because it did not treat sexual and gender minorities as negative stereotypes. The main character, Freddie Mercury, was a foreigner in the UK, and his appearance was unique in that he had misaligned teeth. Sexuality was just one of the many elements that made up his personality. The movie also positively portrayed his dreams, success, and interactions with his peers, including the sexual and gender majorities. The predictions in this study are

that the film-viewing intervention added to lectures would improve the participants' impressions of and self-efficacy in interaction with sexual and gender minorities, and reduce transphobia, discomfort, and levels of acceptance or tolerance of discrimination.

2. Methods

2.1 Participants and intervention procedure

We conducted a nonequivalent two-group pre-post-test intervention study with university students enrolled in clinical psychology at a university in the Chugoku region of Japan in 2019. Before starting the class, the first author (certified clinical psychologist) explained the research and asked the students to answer the "Survey on perceptions and attitudes toward sexual diversity." After obtaining informed consent, 192 participants were enrolled and divided into the intervention group and the control group. We classified the two groups based on a course including sexual and gender minorities in the lecture plan.

The students in the intervention group took the lecture for 105 minutes and the film-viewing for 135 minutes. Table 1 showed the contents of the intervention. We used slide materials to educate about sexual and gender minorities in the class and presented human rights promotion videos for two stories. Then, the film 'Bohemian Rhapsody' was played in the lecture room on a large screen. On the other hand, the

Table 1 Intervention (lecture and film-viewing) and outline

Items included	Outline
Lecture	
1 What is LGBT	We explained that LGB is an expression related to sexual orientation and T is an expression related to gender identity, and that the term LGBT includes qualitatively different states of sexuality.
2 Prevalence of sexual and gender minorities	We introduced the prevalence of gender dysphoria ³²⁾ , and LGBTQ persons by the sample survey in the United States ³³⁾ and the internet survey in Japan ³⁴⁾ .
3 Causes of gender dysphoria / gender identity disorder	We introduced the hypothesis of physical gender differentiation and brain sex differentiation ³⁵⁾ , and explained that gender dysphoria and sexual orientation are not problems of parenting or nurture.
4 Characteristics of gender dysphoria until childhood	We explained the feelings, behavioral characteristics and worries of Trans men and Trans women in childhood, and the differences between awareness of gender dysphoria and the time of coming out ^{36,37)} .
5 Internalization of phobia	We explained each phobia and its background ^{36,38,39)} .
6 Video viewing	We screened "Live As You Are. Human Rights For People With Sexual And Gender Minorities" produced by the Human Rights Bureau, Ministry of Justice ¹⁵⁾ .
7 Supports and medical treatment	We explained that minority sexualities are not a disease and medical treatment is not needed. The guidelines for diagnosis and treatment of gender dysphoria / gender identity disorder ⁴⁰⁾ were also explained.
8 Difficulties in school and how to deal with them	We explained the difficulties that the parties face in relationships with friends and teachers at school or in class, etc., and explained a guidance resource made by the Ministry of Education, Culture, Sports, Science and Technology ⁴¹⁾ .
9 Psychosocial issues related to employment	We explained the difficulties during the school age period, job hunting period, and early employment period ⁴²⁾ .
Film	
"Bohemian Rhapsody" (20th Century Fox Movie, 2018)	This movie is a biographical film set in England in the 1970s and 1980s, with the vocalist of a rock band as the main character. This movie describes the success of the rock band, the hero's awareness of sexuality, relationships with partners, and feuds with band members.

students in the control group took the lecture on developmental disabilities, neuropsychology, and academic skills for 240 minutes according to omnibus-style classes.

We then asked the attendees of both groups to answer the same survey after the lecture. The period between responses to the pre-survey and post-survey was two weeks.

Of the 192 participants, 125 (60 in the intervention group and 65 in the control group) completed the pre-and post-intervention questionnaires. Of the 125 participants who answered both the pre-and post-intervention questionnaires, 108 participants (51 in the intervention group and 57 in the control group) were confirmed to be valid. Subsequently, the participants who had already viewed the film before taking this class were removed, and as a result, 102 participants (45 in the intervention group and 57 in the control group) were left for analysis. The response rate was 81.6%, with a mean age of 19.76 ($SD = 0.74$) for the intervention group and 18.45 ($SD = 0.90$) for the control group.

2.2 Survey content and measurement scale

The questionnaire consisted of a manual, face sheet (participation consent, self-report of age, sex assigned at birth, gender identity, and sexual orientation), impressions of sexual and gender minorities (adjective pairs, 7-point semantic differential scale, hereinafter referred to as impressions), self-efficacy in interaction (7-point Likert scale, hereinafter referred to as self-efficacy), scales of discomfort, transphobia, and level of acceptance or tolerance of discrimination (6-point Likert scale each). The reasons for using a combination of multiple attitude scales in this study were as follows. When measuring attitudes toward a person, in addition to emotional aspects such as liking or disliking, behavioral-level predictions about how one would behave in an actual situation are also important indicators. And attitudes include not only general impressions of people and predictions of behavior, but also prejudicial attitudes colored by negative emotions such as apparent phobia and discomfort, as well as perceptions and judgments of specific discriminatory situations. Therefore, when measuring attitudes toward sexual and gender minorities, it was necessary to understand multiple aspects, not just one. In addition, the questionnaire included items regarding sexual and gender minorities, such as whether or not they had learned about it at schools, whether or not they had acquaintances who identified as a sexual and/or gender minority, whether or not they had experience reading texts or watching videos with sexual and/or gender minorities (hereinafter referred to as information contact), and whether or not they had volunteered or participated in club activities related to sexual and/or gender minorities. Questions regarding the request for more in-depth individual surveys were also included, but these are not used in this paper and will be omitted from the following descriptions. The questionnaire used in the post-survey consisted of impressions, self-efficacy, discomfort, transphobia, level of acceptance or tolerance of discrimination, and a free description column to describe their impression of the course. In addition, we assigned arbitrary numbers in pairs to the pre-survey and post-survey forms in advance, and at the time of the pre-survey, the post-survey form was also bound to a clear file and distributed at the same time, so that the answers of the same participants were linked anonymously.

The semantic differential method was used to measure the impressions. Sasaki and Ohmori⁴³ constructed a scale consisting of adjective pairs used for personality recognition⁴⁴ and for impressions of transgender people⁴⁵ and gay people¹⁹ and the other adjective pairs for measuring impressions of sexual and gender minorities. Then, they performed factor analysis (maximum likelihood method and promax rotation) using the data of 240 university students and extracted three factors. These factors were named "familiarity", "social disadvantage", and "sincerity", respectively, and the internal consistency of each factor was as high as 0.72 to 0.83. In this study, we used these three factors as a scale and asked for answers using a 7-point semantic differential scale. The 6 items of "familiarity" (1st time $\alpha = 0.87$; 2nd time $\alpha = 0.88$) measured the impression of familiarity with sexual and gender minorities. The lower the score, the more familiar the respondents were to sexual and gender minorities. The 6 items of "social disadvantage" (1st time $\alpha = 0.78$; 2nd time $\alpha = 0.80$) measured the impression that sexual and gender minorities were socially disadvantaged. The higher the score, the more the respondents had the impression that sexual and gender minorities

were socially disadvantaged. The 4 items of "sincerity" (1st time $\alpha = 0.81$; 2nd time $\alpha = 0.75$) measured the impression of sincere personality traits of sexual and gender minorities. The lower the score, the more the respondents had the impression that sexual and gender minorities had sincere personality traits.

For self-efficacy, we used the General-Purpose Scale of Self-Efficacy Beliefs in Interactions with Students with Disabilities⁴⁶⁾. On this scale, the assumption was "a university student of the same sex and who you are not familiar with, and although you are not sure, the student appears to be a sexual or gender minority that applies to LGBT." The original version of this scale was developed by Kawauchi⁴⁶⁾ as a two-factor general-purpose scale that measures self-efficacy in interactions with others that students may encounter on campus and its reliability and validity have been confirmed. Sasaki and Ohmori⁴³⁾ performed factor analysis (maximum likelihood method and promax rotation) on the data when the target assumed at the time of response was sexual and gender minorities and found that only one item had a high factor loading for both factors. However, the same two factors as Kawauchi⁴⁶⁾ were confirmed, and the items were not excluded and named "friendship" and "self-assertion". The internal consistency of this scale was as high as 0.87 to 0.93. In this study, we used these two factors and asked participants for answers on how easy they are to be involved with sexual and/or gender minorities using a 7-point Likert scale. The 9 items of "friendship" (1st time $\alpha = 0.93$; 2nd time $\alpha = 0.96$) indicated that the higher the score, the easier it was to have a friendship with a sexual and/or gender minority, and the 9 items of "self-assertion" (1st time $\alpha = 0.88$; 2nd time $\alpha = 0.92$) showed that the higher the score, the easier it was to assert oneself to a sexual or gender minority.

To measure transphobia, we used the Japanese translation⁴⁷⁾ of the Transphobia Scale by Nagoshi et al.⁴⁸⁾. This scale was a one-factor scale developed by Nagoshi et al.⁴⁸⁾ using the items on the flexibility of gender aptitude by Bornstein⁴⁹⁾, and its reliability and validity had been verified. In the Japanese version, Iida et al.⁴⁷⁾ confirmed the reliability and internal consistency by item-total correlation analysis. Sasaki and Ohmori⁴³⁾ also confirmed the one-factor scale, and the internal consistency was as high as 0.85. The higher the score of the 9 items (1st time $\alpha = 0.88$; 2nd time $\alpha = 0.91$), the more the respondents had a negative attitude toward people who are transgender.

To measure discomfort, we used a discomfort scale in interaction with others. This is a part of Kawauchi's⁵⁰⁾ Attitude Scale towards persons with disabilities, and the disability condition assumed by the respondents was modified to be "sexual and gender minority". Although there are problematic aspects of using this scale, in the context of Japan, in general, sexual and gender minorities have been treated as part of sexual disorders in recent years and tend to be subject to the discrimination and prejudice like a person with disabilities. Kawauchi⁵⁰⁾ confirmed the factor validity and high internal consistency of this scale, and Sasaki and Ohmori⁴³⁾ also confirmed one factor, and the internal consistency was as high as 0.92. The higher the score of the 8 items (1st time $\alpha = 0.94$; 2nd time $\alpha = 0.94$), the higher the discomfort when interacting with sexual and gender minorities.

To measure the level of acceptance or tolerance of discrimination, we used a scale made by Sasaki and Ohmori⁴³⁾ consisting of questions from Hidaka⁵¹⁾ and some other questions. This scale was examined in terms of content by the doctor, clinical psychologist, and graduate student involved in the study, and its internal consistency was as high as 0.81⁴³⁾. The higher the score of the 6 items (1st time $\alpha = 0.82$; 2nd time $\alpha = 0.87$), the more accepting or tolerant of discrimination the participants were against sexual and gender minorities.

Table 2 shows impressions and self-efficacy, and Table 3 shows transphobia, discomfort, and the level of acceptance or tolerance of discrimination. To avoid the hassle of participants reading similar explanations repeatedly, we arranged the scale items of transphobia, discomfort, and the level of acceptance or tolerance of discrimination within one question in the questionnaire. Then, using a 6-point Likert scale we asked, "Which is the closest to your feelings for each item?" Since there are no English versions of the scales except for the transphobia scale, the items in each table are temporarily translated into English by the authors for convenience. Therefore, it should be noted that these scales cannot be immediately used as the English version of the scales.

Table 2 Scale items related to impressions and self-efficacy

Scale and Factor	Items	
Impression ⁴³⁾		
Familiarity	1 far away - familiar	
	2 difficult to talk to - easy to talk to	
	3 easy to accept - difficult to accept (reverse scored)	
	4 special - ordinary	
	5 hate - favorite	
	6 friendly - unfriendly (reverse scored)	
Social disadvantage	1 looks hard - looks fun	
	2 isolated - connected	
	3 free - not free (reverse scored)	
	4 fulfilling - empty (reverse scored)	
	5 easy - difficult (reverse scored)	
	6 unhappy - happy	
Sincerity	1 not serious - serious	
	2 untidy - tidy	
	3 honest - cheeky (reverse scored)	
	4 bright - dark (reverse scored)	
Self-efficacy ⁴⁶⁾		
Friendship	1 When discussing with the student how to get to a restaurant	
	2 When the student asks to accompany you to an on-campus meeting	
	3 When asked to go to the library for research that the student cannot do	
	4 When dining with the student at a restaurant	
	6 When the student invites you to go to the classroom together before the lecture starts	
	9 When inviting the student to a party in the dormitory	
	10 When inviting the student to have coffee with them at a coffee shop	
	11 When you are referred to the student by someone else	
	13 When trying to talk to the student	
	Self-assertion	5 When you refuse to help the student because you think the student can do it themselves
		7 When you have a different opinion from the student
		8 When you are asking the student to lend 1000 yen
		12 When you refuse to help the student because you are busy
14 When you refuse to lend class notes to the student because you need them		
15 When you suggest the student to share the work between the two of you fairly		
16 When you warn the student to be quiet at the library, as the student is noisy		
17 When you prompt the student to return the 1000 yen you lent them last month		
18 When you have a request to the student		

Note. All items have been temporarily translated into English by the authors of this article.

Table 3 Scale items for transphobia, discomfort, and level of tolerance or acceptance of discrimination

Scale	Items
Transphobia ⁴⁸⁾	
1	I don't like it when someone is flirting with me, and I can't tell if they are a man or a woman.
2	I think there is something wrong with a person who says that they are neither a man nor a woman.
3	I would be upset if someone I'd known a long time revealed to me that they used to be another gender.
4	I avoid people on the street whose gender is unclear to me.
5	When I meet someone it is important for me to identify them as a man or a woman.
6	I believe that the male / female dichotomy is natural.
7	I am uncomfortable around people who don't conform to traditional gender roles, e.g., aggressive women or emotional men.
8	I believe that a person can never change their gender.
9	A person's genitalia define what gender they are, e.g., a penis defines a person as being a man, a vagina defines a person as being a woman.
Discomfort ⁵⁰⁾	
1	I am reluctant to interact with sexual and gender minorities.
2	I hesitate to help sexual and gender minorities.
3	I am terribly careful about dealing with sexual and gender minorities.
4	I feel like a person in a different world from sexual and gender minorities.
5	I have difficulty communicating with sexual and gender minorities.
6	I do not know what to talk about with sexual and gender minorities.
7	I hesitate to ask something to sexual and gender minorities.
8	I cannot say something to sexual and gender minorities casually.
Level of tolerance or acceptance of discrimination ⁴³⁾	
1	To be honest, I do not think I can understand gender dysphoria (gender identity disorder).
2	To be honest, I do not think I can understand same sex love.
3	I think it cannot be helped if same-sex marriage is not allowed.
4	I think it is somehow wrong for sexual and gender minorities to claim their right to have children.
5	It's no wonder sexual and gender minorities are bullied and harassed.
6	I think it is reasonable for sexual and gender minorities to be refused employment or to be dismissed for that reason.

Note. Except for Transphobia, the items have been temporarily translated into English by the authors of this article.

2.3 Statistical analysis

We tabulated the participants' sex assigned at birth and gender identity, sexual orientation, past learning experience at school regarding sexual and gender minorities, presence or absence of acquaintances who identify as a gender or sexual minority, presence or absence of information contact with sexual and/or gender minorities, presence or absence of volunteer activities related to sexual and/or gender minorities, etc. We also performed a χ^2 test (Fisher's exact test if the peripheral frequency has a value of 10 or less) for the response distributions of the intervention and control groups. Next, we calculated individual scores for each scale for impressions, self-efficacy, transphobia, discomfort, and the level of acceptance or tolerance of

discrimination, and then, performed an analysis of covariance of the effects of the intervention and control groups. At that time, the score of the preliminary survey was used as a covariate, and the score of the post-survey was used as the dependent variable. Statistical analysis software SPSS (IBM SPSS Statistics, Version 23) was used for the analysis.

3. Results

3.1 Participants' past experiences

Table 4 shows the participants' past learning experiences at schools, presence or absence of acquaintances who identify as a sexual or gender minority, information contact, volunteer activities, etc. by group. There was no significant bias between the groups regarding past learning experience at schools, acquaintances of sexual and gender minorities, information contact, and volunteer activities.

Table 4 Past learning experience at schools, acquaintances, information contact, volunteer activities, etc.

Question items	Answers				Test of association		
	Intervention group <i>n</i> = 45 (100%)		Control group <i>n</i> = 57 (100%)		χ^2 value	<i>df</i>	<i>p</i> (two-sided)
	Yes	No	Yes	No			
Learning experience	35 (77.8)	10 (22.2)	45 (78.9)	12 (21.1)	0.02	1	1.00
Primary school	2 (4.4)	43 (95.6)	3 (5.3)	54 (94.7)			1.00 ^a
Junior high school	12 (26.7)	33 (73.3)	22 (38.6)	35 (61.4)	1.61	1	0.29
High school	26 (57.8)	19 (42.2)	26 (45.6)	31 (54.4)	1.49	1	0.24
University	17 (37.8)	28 (62.2)	20 (35.1)	37 (64.9)	0.08	1	0.84
Acquaintances	14 (31.1)	31 (68.9)	17 (29.8)	40 (70.2)	0.02	1	1.00
Information contact	27 (60.0)	18 (40.0)	25 (43.9)	32 (56.1)	2.62	1	0.12
Volunteer activities, etc.	0 (0.0)	45 (100.0)	1 (1.8)	56 (98.2)			1.00 ^a

Note. The numbers in the answer column represent the number of people (%).

^a Since the peripheral frequency has a value of 10 or less, the exact significance (two-sided) by Fisher's exact test is shown.

3.2 Fluctuations in pre- and post-scoring of each scale (factor)

Table 5 shows the average scores of the pre-survey and post-survey of each scale (factor) in the intervention group and the control group. For each scale (factor), we performed a covariance analysis of the effects of the intervention and control groups, with the pre-survey score as the covariate and the post-survey score as the dependent variable. As a result of the test, there was no significant difference between the groups for any scale (factor).

Next, Table 6 shows the average scores of the pre-survey and post-survey of the intervention group and control group, limited to those who have no sexual or gender minority acquaintances and no experience of information contact or volunteer activities involving sexual and gender minorities, regardless of learning experiences at schools.

For each scale (factor), we performed a covariance analysis of the effects of the intervention and control groups, with the pre-survey score as the covariate and the post-survey score as the dependent variable. As a result of the test, there was a significant difference between the groups regarding the "familiarity" of their impressions ($F(1, 37) = 6.02, p = 0.02, \eta^2_{\text{partial}} = 0.14$). The post-survey score increased by 0.21 in the control group, while the post-survey score decreased by 0.32 in the intervention group. It was shown that while the control group's impression of their "familiarity" to sexual and gender minorities diminished, the attendance

Table 5 Mean and standard deviation of each individual score, and the results of covariance analyses

Scale (factor)	Group	<i>n</i>	Pre		Post		<i>F</i> value	<i>p</i> value	η^2_{partial}
			<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Impression									
Familiarity	Intervention	45	3.57	1.25	3.50	1.19	1.99	0.16	0.02
	Control	57	3.57	1.06	3.70	1.07			
Social disadvantage	Intervention	45	4.14	0.89	4.16	1.05	0.07	0.79	0.00
	Control	57	4.24	0.83	4.20	0.80			
Sincerity	Intervention	45	3.04	0.81	3.18	0.78	0.07	0.79	0.00
	Control	57	3.18	0.99	3.23	0.83			
Self-efficacy									
Friendship	Intervention	45	5.32	1.21	5.40	1.26	1.23	0.27	0.01
	Control	57	5.57	1.10	5.40	1.30			
Self-assertion	Intervention	45	4.73	1.09	4.84	1.27	1.13	0.29	0.01
	Control	57	4.82	1.13	4.75	1.28			
Discrimination / Prejudice									
Discomfort	Intervention	45	2.56	1.11	2.63	0.95	1.03	0.31	0.01
	Control	57	2.45	0.92	2.68	1.01			
Transphobia	Intervention	45	2.55	0.87	2.50	0.86	0.33	0.57	0.00
	Control	57	2.52	0.90	2.53	0.98			
Level of tolerance or acceptance of discrimination									
	Intervention	45	1.96	0.83	2.06	0.87	0.77	0.38	0.01
	Control	57	1.98	0.80	2.17	0.96			

Note. *F* values, *p* values, and effect sizes indicate the results of analysis of covariance, with the pre-survey score as the covariate and the post-survey score as the dependent variable.

Table 6 The results of covariance analyses for those who have no acquaintances, no information contact etc.

Scale (factor)	Group	<i>n</i>	Pre		Post		<i>F</i> value	<i>p</i> value	η^2_{partial}
			<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Impression									
Familiarity	Intervention	15	4.48	1.12	4.16	1.26	6.02*	0.02	0.14
	Control	25	3.96	0.78	4.17	0.97			
Social disadvantage	Intervention	15	4.40	1.09	4.54	1.29	1.91	0.18	0.05
	Control	25	4.31	0.72	4.19	0.84			
Sincerity	Intervention	15	3.03	0.78	3.15	0.75	0.00	0.99	0.00
	Control	25	3.35	0.92	3.37	0.88			
Self-efficacy									
Friendship	Intervention	15	4.63	1.34	4.81	1.38	1.74	0.20	0.05
	Control	25	5.39	1.10	5.05	1.39			
Self-assertion	Intervention	15	4.59	0.86	4.76	0.92	0.82	0.37	0.02
	Control	25	4.65	1.12	4.57	1.22			
Discrimination / Prejudice									
Discomfort	Intervention	15	3.20	1.26	3.01	1.08	1.08	0.31	0.03
	Control	25	2.81	0.86	2.94	0.88			
Transphobia	Intervention	15	3.09	0.83	2.97	0.79	0.01	0.91	0.00
	Control	25	2.76	0.87	2.68	1.03			
Level of tolerance or acceptance of discrimination									
	Intervention	15	2.60	0.89	2.60	0.88	0.02	0.88	0.00
	Control	25	2.29	0.86	2.30	1.03			

Note. *F* values, *p* values, and effect sizes indicate the results of analysis of covariance, with the pre-survey score as the covariate and the post-survey score as the dependent variable.

**p*<.05

group's impression of their "familiarity" increased.

4. Discussion

We predicted that the film-viewing intervention added to lectures would improve the participants' impressions of and self-efficacy in interaction with sexual and gender minorities, and reduce transphobia, discomfort, and levels of acceptance or tolerance of discrimination. The results showed that there was no effect of the intervention on any of the scales. However, the participants who had no acquaintances and no information contact or volunteer activities related to sexual and gender minorities or information changed their impressions of sexual minorities. They felt more "familiar" with them after the lecture. The intervention of watching a movie in the lecture made those who perceived themselves as unfamiliar with sexual and gender minorities feel closer to them.

In intervention studies using television and films in western countries, improvement in viewers' attitudes was confirmed, which contrasts with the results of our study. Schiappa et al.²⁴⁾ showed that when American college students watched TV dramas for a total of about 10 hours they significantly reduced their prejudiced attitudes toward gay men. In the same study, watching a TV program for 2 hours and 15 minutes also significantly reduced the prejudiced attitude toward gay men. Madžarević and Soto-Sanfiel²⁵⁾ also showed that watching a film for 1 hour and 55 minutes significantly reduced homophobia in Serbian college students. Furthermore, Case and Stewart²⁶⁾ confirmed the effects of multiple methods on American university students. In that study, watching a TV documentary for about five minutes depicting transgender people significantly reduced the negative attitudes and beliefs in myths towards transgender people. Many previous studies demonstrated that television and film viewing had a certain effect as a means of reducing discrimination and prejudice against sexual and gender minorities; while this study's result was negative. The contents of the video, the degree of acceptance of sexual and gender minorities, or cultural differences may affect the results. As a limitation of this study, we cannot deny the possibility that, for example, from the perspective of the university students who took the course, it was difficult for them to recognize the existence and personalities of sexual and gender minorities as necessarily related to their own daily lives. This is because the main character in the movie was a foreigner, a star of a prominent rock band, and so on. In addition, this study suggested that the effects may differ depending on the past experiences of the participants. Therefore, there is room for further verification through the accumulation of data on the differences in the effects of film-viewing interventions depending on the attributes of the participants and factors related to their past experiences.

Considering the intervention study involving gender and sexual minority guest speakers and the results of this study, in the context of Japan, educational interventions to improve attitudes toward sexual and gender minorities, which include real stories from guest speakers, are considered to be more effective than lectures by university faculty members and watching films.

We would like to extend this finding and ask: which intervention is more effective, the video viewing in other research contexts or the narratives of the guest speakers in the Japanese research context? In other research contexts, when looking at the change in scores before and after the intervention, the index of attitudes increased or decreased in the intervention by video viewing. Since both the increases or decreases are positive changes in attitudes, it can be considered that attitudes have improved positively. On the other hand, in the intervention study of the narratives of the guest speakers in Japan, the index of attitudes increased or decreased. Since all these changes showed positive changes in attitudes, it is considered that attitudes improved positively. Since the scales used between studies are different, we must be careful about simple comparisons, but it seems that interventions using video viewing overseas and interventions using the narratives of the guest speakers who are sexual or gender minorities in Japan have the same level of effectiveness in the sense that all of them have changed significantly in the positive direction of attitudes. Considering that the effect of film-viewing was not sufficiently observed in this study, intervention using film-viewing should be an auxiliary means, and the intervention method of listening to the guest speakers'

narratives is more effective in reducing discrimination and prejudice in Japan. Western studies also suggest that knowing or being friends with gender and sexual minorities were associated with respondents' likelihood to participate in pro-LGBT activism^{52,53}. Therefore, it is considered that the significance of directly knowing the existence is common to Japan.

However, as mentioned in the introduction, Japan has not enacted a law to eliminate discrimination against sexual and gender minorities, so the protection of the human rights for sexual and gender minorities is insufficient. Therefore, no matter how valid the narratives of the guest speakers are, there are potential problems to this practice of asking guest speakers who are gender or sexual minorities to share their experiences. When they disclose their sexuality or gender identity, they may be at risk of being attacked by others. In addition, there is no nationwide educational system or program to develop human resources for teaching about sexual and gender minorities. Therefore, in many cases, the cooperation of the guest speakers concerned cannot be obtained due to the risks and lack of infrastructure to support these initiatives. Therefore, it is necessary to continue to develop effective educational content and methods that can be used as alternatives to the participation of the guest speakers.

When listening to stories or communicating with the guest speakers is not possible, we propose to apply a method of including simulated people. As mentioned in the introduction, evidence of the usefulness of simulations to learn the emotions and experiences of sexual and gender minorities is being accumulated. Regardless of the medical field, it will be possible to learn from simulated stories from a trained simulated sexual or gender minority. Further research will be needed to confirm the efficacy of using a simulated person within other faculties, such as education, to eliminate discrimination against sexual and gender minorities.

5. Conclusions

Adding a film-viewing intervention to lectures about sexual and gender minorities did not immediately change the overall attitudes of university students. Some people who recognized that they had no acquaintances with sexual and gender minorities and were not interested in related information improved their impression of "familiarity", but the effect of the intervention was small. Interventions aimed at reducing discrimination and prejudice by film-viewing, which are effective in western countries, have not been effective in Japan. Considering the findings of this study and previous studies, interventions that incorporate the narratives of the guest speakers who are gender or sexual minorities may be more effective in Japan. Therefore, if the guest speakers concerned can attend the class, it is desirable to implement an educational program with their cooperation. When it is difficult to find the guest speakers concerned, a simulated person who has been trained as a specialist within the field of gender and sexual minorities will become a helpful educator.

Notes

† 1) LGBTQX: In addition to LGBT initials, Q refers to queer and questioning identities and X refers to X-gender identities (similar to gender-queer or gender non-conforming identities in the west).

Ethics approval and consent to participate

This study was approved by the Research Ethics Committee of Okayama University Graduate School of Education in Okayama, Japan (IRB number 26, Approved on February 19, 2018, and May 30, 2019), and conducted based on the Declaration of Helsinki.

Informed consent was obtained from all individual participants included in the study. We informed participants that participation was voluntary, the individual could not be identified by the questionnaire, it was not related to their grades, and the data would be responsibly managed.

For students in the control group, classes on sexual and gender minorities were offered to supplement their learning opportunities.

Conflicts of interest

The authors have no conflicts of interest to declare that are relevant to the content of this article.

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