



Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.jfma-online.com



Original Article

Role of mental health in the attitude toward same-sex marriage among people in Taiwan: Moderating effects of gender, age, and sexual orientation



Yu-Te Huang^{a,1}, Mu-Hong Chen^{b,c,1}, Huei-Fan Hu^{d,***},
Nai-Ying Ko^{e,f,**}, Cheng-Fang Yen^{g,h,*}

^a Department of Social Work and Social Administration, The University of Hong Kong, Hong Kong

^b Department of Psychiatry, Taipei Veterans General Hospital, Taipei, Taiwan

^c Division of Psychiatry, School of Medicine, National Yang-Ming University, Taipei, Taiwan

^d Department of Psychiatry, Tainan Municipal Hospital (Managed by Show Chwan Medical Care Corporation), Tainan, Taiwan

^e Departments of Nursing, College of Medicine, National Cheng Kung University and Hospital, Tainan, Taiwan

^f Center of Infection Control, National Cheng Kung University Hospital, Tainan, Taiwan

^g Department of Psychiatry, School of Medicine, College of Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan

^h Department of Psychiatry, Kaohsiung Medical University Hospital, Kaohsiung, Taiwan

Received 12 January 2018; received in revised form 3 January 2019; accepted 14 March 2019

KEYWORDS

Mental health;
Attitude toward
same-sex marriage;
Age;
Gender;
Sexual orientation

Purpose: The aims of the study were to examine the role of mental health in peoples' attitude toward same-sex marriage in Taiwan, as well as the moderating effects of gender, age, and sexual orientation on the association between mental health and attitude toward same-sex marriage.

Methods: In total, 3235 participants were recruited through a Facebook advertisement. Each participant completed a questionnaire assessing attitude toward same-sex marriage and a 5-item Brief Symptom Rating Scale (BSRS-5). Multiple regression analysis was performed to investigate the association between mental health and attitude toward same-sex marriage.

* Corresponding author. Department of Psychiatry, Kaohsiung Medical University Hospital, 100 Tzyou 1st Road, Kaohsiung, 807, Taiwan. Fax: +886 7 3134761.

** Corresponding author. Department of Nursing, College of Medicine, National Cheng Kung University, No. 1, University Road, Tainan City, 701, Taiwan, ROC.

*** Corresponding author. Department of Psychiatry, Tainan Municipal Hospital, 670 Chongde Road, East District, Tainan, 701, Taiwan. Fax: +886 6 2606351.

E-mail addresses: p03132006@gmail.com (H.-F. Hu), nyko@mail.ncku.edu.tw (N.-Y. Ko), chfaye@cc.kmu.edu.tw (C.-F. Yen).

¹ Y-T Huang and M-H Chen contributed equally to this study.

<https://doi.org/10.1016/j.jfma.2019.03.011>

0929-6646/Copyright © 2019, Formosan Medical Association. Published by Elsevier Taiwan LLC. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Results: Poor mental health was significantly associated with a low level of support for same-sex marriage. Age and sexual orientation moderated the association between mental health state and support for same-sex marriage. A significant association between poor mental health and a low level of support for same-sex marriage was observed only in older participants but not in younger participants. Moreover, a significant association between poor mental health and a low level of support for same-sex marriage was indicated only in heterosexual participants but not in non-heterosexual participants.

Conclusion: Our findings suggest that poor mental health was significantly associated with opposition to same-sex marriage. This relationship is more pronounced among older and heterosexual people.

Copyright © 2019, Formosan Medical Association. Published by Elsevier Taiwan LLC. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Introduction

Same-sex marriage has been legalized in over 20 nations worldwide, including the Netherlands, Canada, Argentina, New Zealand, the United States, and Germany. The Taiwan Social Change Survey reported that in 1991, only 11.37% of Taiwanese citizens supported the legalization of same-sex marriage and 57% opposed it. However, in 2015, up to 55% of the survey participants supported its legalization and 37% opposed it.¹ In May 2017, Taiwan's constitutional court ruled that the current civil law preventing members of the same sex from marrying violates their human right to equality and is unconstitutional, and directed that same-sex marriage should be legislated within 2 years.¹

Increasing evidence supports the belief that same-sex marriage is not only a fundamental human right for gay men, lesbians, and bisexual men and women, but also a marker for the improved mental and physical health of people in this community.² For example, a study in the United States found that the implements of states same-sex marriage policies were associated with a 7% relative reduction of suicide attempts in the proportion of both heterosexual and homosexual high school students.³ Another study in the United States found that homosexual and bisexual individuals residing in states without same-sex marriage experienced greater anxiety and lower subjective wellbeing compared to sexual minority participants residing in states with same-sex marriage and heterosexual participants residing in states with or without same-sex marriage.⁴ These studies provided empirical evidence for an association between same-sex marriage policies and mental health outcomes.

To our knowledge, no study has examined the association between mental health and the attitudes toward same-sex marriage, though research found that favorable attitude toward homosexuality and bisexuality is positively associated with health and subjective well-being. For example, the European Social Survey determined that the attitude of accepting people with homosexuality and bisexuality is significantly associated with increased self-rated health and subjective well-being, whereas sexuality-based discrimination had a significantly negative effect on self-related health and subjective well-being.⁵ Moreover, homonegativity was the best predictor of negative

attitudes toward gay male and lesbian marriage.⁶ The association between mental health and the attitudes toward same-sex marriage warrants further study.

Given that same-sex marriage is a legalized equality and contributes to health of sexual minority population, it is reasonable to hypothesize that gays and lesbians, no matter in good or bad mental health, have positive attitude toward same-sex marriage. However, the minority stress theory has posited that societal negative attitudes toward homosexuality not only negatively affect the mental health of lesbian, gay, and bisexual (LGB) people but also contribute to the development of internalized homophobia, a form of self-stigma and self-prejudice.⁷ Internalized homophobia is found to be responsible for an increased risk of depression and anxiety in LGB people.⁸ Thus further study is needed to examine whether mental health is significantly associated with support for same-sex marriage.

Previous studies have suggested that older individuals and men were less likely to support same-sex marriage and exhibited a more negative attitude toward LGB rights.^{9–13} No study examined the moderating effect of age and gender on the association between mental health and support for same-sex marriage. Moreover, research found that transgender identity was associated with higher odds of reported discrimination, depression symptoms, and attempted suicides when compared with non-transgender individuals.¹⁴ However, no study examined whether transgender moderates the association between mental health and support for same-sex marriage.

In our study, using a cross-sectional Internet survey, we investigated the role of mental health in peoples' attitude toward same-sex marriage. Although no study examined the relationship between mental health and attitude toward same-sex marriage, research on general population⁵ and LGB people⁸ has found the significant association between poor mental health and negative attitudes toward homosexuality. Therefore, we hypothesize that poor mental health is significantly associated with low support for same-sex marriage. Because of no study examining the moderators of mental health and attitude toward same-sex marriage, we temporally hypothesize that age, gender, and sexual orientation may moderate the association between mental health and peoples' attitude toward same-sex marriage.

Method

Participants

Participants were recruited through a Facebook advertisement in January, 2017. Facebook users were eligible for this study if they were 20 years or older. The Facebook advertisement included a headline, main text, pop-up banner, and weblink to the research questionnaire website. We designed the advertisement to appear in the “News Feed” of Facebook, which is a streaming list of updates from the user’s connections (e.g. friends) and advertisers. We focused solely on News Feed advertisements, as opposed to other Facebook advertising locations (e.g. the right column), because News Feed advertisements are more effective in terms of recruitment metrics for research studies.¹⁵ We targeted the advertisement to Facebook users by location (Taiwan) and language (Chinese), such that a given advertisement appeared on a user’s news feed as determined by a Facebook algorithm. A de-duplication protocol was applied to identify multiple submissions to preserve data integrity,¹⁶ including cross-validation of the eligibility criteria of key variables and discrepancies in key data and checking for unusually fast completion time (<10 min).¹⁶ Moreover, each Internet Protocol address could register to complete the online questionnaire once only. Our study participants were not given any incentives for participation. This study was approved by the Institutional Review Board (IRB) of Kaohsiung Medical University Hospital. This study used the design of online response to the recruitment and questionnaire anonymously that allowed the respondents deciding to join or not freely and keeping personal information secure. The IRB thus agreed that this study did not obtain informed consent from the respondents.

Measures

Attitude toward same-sex marriage

We used one question to survey the participants’ level of support for same-sex marriage on a 5-point Likert scale range as follows: 0 = very low, 1 = low, 2 = moderate, 3 = high, and 4 = very high.

5-item Brief Symptom Rating Scale (BSRS-5)

The BSRS-5 contains the following five items related to psychopathology: (1) feeling tense or keyed up (anxiety), (2) feeling low in mood (depression), (3) feeling easily annoyed or irritated (hostility), (4) feeling inferior to others (interpersonal hypersensitivity: inferiority), and (5) having trouble falling asleep (insomnia). The participants were asked to rate symptoms on a 5-point scale: 0, not at all; 1, a little bit; 2, moderately; 3, quite a bit; and 4, extremely.¹⁷ A higher total BSRS-5 score indicates having poor mental health. The BSRS-5 was reported to have satisfactory psychometric properties as a measure of detecting psychiatric morbidity in a medical setting or in the community.¹⁷

Demographic variables

Participants’ gender (female, male, homosexual, and undifferentiated or questionable), age, and sexual orientation

(heterosexual, bisexual, homosexual) were also collected. Moreover, participants were classified into heterosexual and non-heterosexual groups.

Procedure and statistical analysis

The association between mental health and the level of support for same-sex marriage was examined using multiple linear regression analysis models to control for the effects of gender, age, and sexual orientation. We also employed the standard criteria proposed by Baron and Kenny¹⁸ to examine whether the association between mental health state and support for same-sex marriage was different as a function of the participants’ gender, age, and sexual orientation. According to the criteria, moderation occurred when the interaction terms for the predictor (mental health state) and the hypothesized moderators (gender, age, and sexual orientation) were significantly associated with the dependent variable (support for same-sex marriage), after controlling for the main effects of both the predictors and hypothesized moderator variables. In this study, if good mental health and hypothesized moderators were significantly associated with support for same-sex marriage, the interactions (mental health \times hypothesized moderators) were further included in the regression analysis to examine the moderating effects. A *p* value of 0.05 was considered statistically significant for all tests.

Results

A total of 3372 Facebook users completed the online questionnaire. Among these users, 137 were excluded from the analysis due to an unqualified age (<20 years) or an erroneous value (>100 years). The final data consisting of 3235 participants were analyzed. Descriptive statistics of gender, age, sexual orientation, support for same-sex marriage, and mental health are presented in Table 1. The results of examining the relationships of supporting same-sex marriage with gender, age, sexual orientation, and mental health status by using ANOVA, *t* test and Pearson’s correlation are shown in Table 2. The results indicated

Table 1 Gender, age, sexual orientation, support for same-sex marriage, and mental health status (N = 3235).

	<i>n</i> (%)	Mean (SD)	Range
Gender			
Female	2018 (62.4)		
Male	1170 (36.2)		
Transgender	47 (1.4)		
Sexual orientation			
Non-heterosexual	1761 (55.5)		
Heterosexual	1440 (44.5)		
Age (years)		30.7 (8.0)	20–67
Mental health on the BSRS-5		4.7 (5.0)	0–20
Supporting same-sex marriage		3.7 (0.8)	0–4

Note: BSRS-5: 5-item Brief Symptom Rating Scale.

Table 2 Relationships of support for same-sex marriage with gender, age, sexual orientation, and mental health status: ANOVA, *t* test and Pearson’s correlation.

	Supporting same-sex marriage		
	Mean (SD)	<i>F</i> or <i>t</i>	Pearson’s <i>r</i> <i>p</i>
Gender ^a			
Female	2.9 (0,4)	1.037	0.355
Male	2.9 (0.4)		
Transgender	2.9 (0.4)		
Sexual orientation ^b			
Heterosexual	2.8 (0.6)	-14.559	<0.001
Non-heterosexual	3.0 (0.2)		
Age ^c			
		-0.211	<0.001
Mental health on the BSRS-5 ^c			
		0.009	0.598

BSRS-5: 5-item Brief Symptom Rating Scale.

^a *t*-test.

^b Analysis of variance (ANOVA).

^c Pearson’s correlation.

that non-heterosexual participants had a more supportive attitude toward same-sex marriage than heterosexual ones. Age was negatively associated with the level of support for same-sex marriage. Gender and mental health on the BSRS-5 were not significantly associated with the level of support for same-sex marriage. Fig. 1 shows the scatter plot between mental health on the BSRS-5 and age by sexual orientation.

Table 3 presents the result of the linear regression analysis that examines the association between mental health and the level of support for same-sex marriage. The results indicate that after controlling for the effects of gender, age, and sexual orientation, poor mental health was significantly associated with lower support same-sex marriage ($\beta = 0.088, p < 0.001$). Because gender, age, and sexual orientation were significantly associated with

Table 3 Association of support for same-sex marriage with mental health: moderating effects of gender, age, and sexual orientation.

	Model I		Model II	
	β	SE	β	SE
Gender (reference = female)				
Male	-0.051**	0.03	-0.050**	0.03
Transgender	0.002	0.115	0.002	0.115
Age	-0.163***	0.002	-0.177***	0.002
Sexual orientation (reference = heterosexual)				
BSRS-5	0.289***	0.030	0.302***	0.030
Mental health on BSRS-5	-0.088***	0.003	0.239**	0.012
Moderation term				
BSRS-5 x Gender			0.001	0.005
BSRS-5 x Age			-0.478***	0.000
BSRS-5 x Sexual orientation			0.161***	0.006
<i>F</i> value	83.20***		66.47***	
<i>R</i> ²	0.114		0.142	

****p* < 0.001; ***p* < 0.01; BSRS-5 = 5-item Brief Symptom Rating Scale.

support for same-sex marriage, their interactions with mental health were constructed and entered in further analyses (see Model 2 in Table 3). These results indicate that the interactions between mental health and age ($\beta = -0.478, p < 0.001$) and between mental health and sexual orientation ($\beta = 0.161, p < 0.001$) are significantly associated with support for same-sex marriage, meaning that age and sexual orientation moderate the association between mental health and support for same-sex marriage.

Further analysis found that a significant association between poor mental health and a low level of support for same-sex marriage only exists in heterosexual people

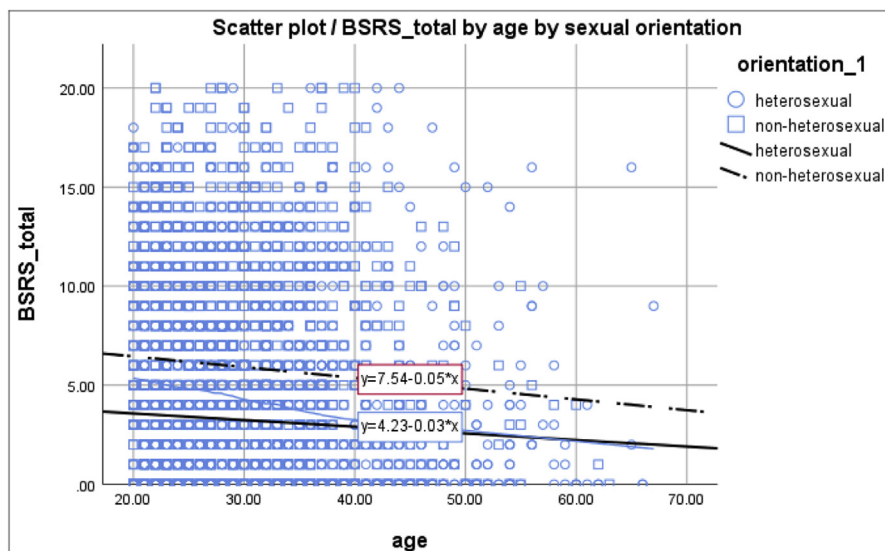


Figure 1 Scatter plot between 5-item Brief Symptom Rating Scale (BSRS-5) and age by sexual orientation.

($\beta = -0.176, p < 0.001$) but not in non-heterosexual people ($\beta = 0.027, p = 0.26$). We also conducted a simple slope analysis suggested by Aiken and West¹⁹ to investigate changes in the slope of BSRS-5 as the function of age. The result shows that the regression coefficient of BSRS changed from not significant ($\beta = 0.041, p = 0.077$) to significant ($\beta = -0.242, p < 0.001$) as the age increases. It thus indicates that the association between poor mental health and a lower level of support for same-sex marriage is more pronounced among older people.

Discussion

The major finding in the current study is that the significant association between poor mental health and a negative attitude toward same-sex marriage only exists in heterosexual people but not in non-heterosexual people. Support for same-sex marriage is a positive attitude toward LGB population.²⁰ Research found that a positive and accepting attitude toward LGB people was associated with better self-reported health and subjective well-being.⁵ However, legalization of same-sex marriage is a new concept different from the traditional concept of opposite-sex marriage. People who are religious and politically conservative not only tend to oppose the legalization of same-sex marriage but also hold discrimination and prejudice against homosexuality in the North America^{20–22} and China.²³ In contrast, self-identified nonreligious and politically liberal people are more likely to support same-sex marriage and accept LGB groups.^{21,24} A meta-analysis including 22,818 participants from 12 countries found that one's political conservatism to be positively associated with anxiety symptoms, feeling threatened and fear of loss, and need for order, structure, and closure; moreover, the analysis reveals that political conservatism is negatively associated with participants' openness to new experiences, toleration of uncertainty, and self-esteem.²⁵ A big data study investigating liberal–conservative differences in happiness-related behavior indicated that relative to conservatives who self-reported greater happiness, liberals more frequently used positive emotional language in their speech and smiled more intensely and genuinely in photographs.²⁶ Moreover, research found the differences in neurocognitive functioning between conservatives and liberals.²⁷ Neurocognitive function may serve as the basis of decision making and mental health problems.²⁸ These findings of previous studies may partially account for the significant association between poor mental health and a negative attitude toward same-sex marriage existing in heterosexual people.

Hatzenbuehler and colleagues found that LGB people with a greater implicit negative attitude toward homosexuality engaged in more rumination and thought suppression and reported more psychological distress.²⁹ Although a review study found that not all studies have confirmed the positive relationship between internalized homonegativity and poor health outcomes,³⁰ homonegative internalization merits consideration as a predisposing factor in several aspects of ill health, including depression and anxiety in LGB people.⁸ Based on the results of these previous studies, one might expect a significant association between poor mental health and a negative attitude toward same-sex

marriage existing in non-heterosexual people. However, the results of the present study did not support the hypothesis. Non-heterosexual participants had a high level of support for same-sex marriage in this study. It is possible that non-heterosexual people with strong internalized homonegativity may not join this study. However, further study warrants to replicate the result of the present study.

The present study found that the association between poor mental health and a lower level of support for same-sex marriage is more pronounced among older people. Previous studies have suggested that older individuals were less likely to support same-sex marriage and exhibited a more negative attitude toward LGB rights.^{9–12} Data from three waves of the World Values Survey collected in 1995, 2006, and 2012 in Taiwan show that overall social tolerance of homosexuality has increased, which is mainly due to cohort succession.³¹ Improvement in education and liberal values related to sex, gender act, and marriage have been found to mediate the cohort differences in tolerance.³¹ Support for same-sex marriage may become the common value in younger generation. Therefore, not like that in older generation, the association between support for same-sex marriage and mental health is not significant in younger generation.

Research has consistently reported that heterosexual men are more homophobic and have a more negative attitude toward homosexuality than heterosexual women.^{13,32} Heterosexual women were substantially more understanding and compassionate toward the LGB community than heterosexual men.³² A national survey conducted by the Taiwan Ministry of Justice also reported that men were more likely to oppose same-sex marriage and other LGB rights such as adoption.⁹ The present study found that male respondents had lower support for same-sex marriage than females, whereas gender did not moderate the association between mental health and support for same-sex marriage.

Compared with the rate of supporting legalizing same-sex marriage (55%) found in the 2015 Taiwan Social Change Survey,¹ the present study found a higher rate of respondents highly or very highly supporting same-sex marriage (92.3%). Although it might indicate that more and more people in Taiwan support same-sex marriage, it is also possible that people who oppose to same-sex marriage did not access to or respond to the recruitment on Facebook.

Research classified those whose total score in the BSRS-5 was 6 or higher as having poor mental health.¹⁷ In the present study 36.4% of respondents had a total BSRS-5 score ≥ 6 . A previous online survey among internet users in Taiwan found that 32.5% of respondents without internet addiction had a total BSRS-5 score ≥ 6 .³³ A previous survey on registered nurses in Taiwan found that 34.9% of participants had a total BSRS-5 score ≥ 6 .³⁴ The rate of participants with poor mental health in this study was compatible to the results of the previous studies applying the same measure.^{33,34}

The present study has some limitations. First, although recruiting participants via Facebook can deliver large numbers of participants quickly, cheaply and with minimal effort compared to mail and phone recruitment, access to Facebook is not yet universal, and people are not all equally motivated to engage with Facebook.³⁵ A systematic review on the study recruiting participants via Facebook

reported that there appeared to be a bias towards people with higher education.³⁶ Another review on the study recruiting participants via Facebook reported a bias towards women, young adults, and people with higher education and incomes.³⁷ Despite Facebook being the most prevalent social media platform in Taiwan, the population composition in Facebook may still be different from that in the real-world community in Taiwan. For example, only 2.5% of the respondents in this study were older than 50, which indicated that the people older than 50 may be less likely to use Facebook or respond to the advertisement of Facebook. Whether our findings could be generalized to the people in the real-world community still requires further investigation.

Second, in the current study, only 44.8% of participants were heterosexual. The 2006–2008 National Survey of Family Growth estimating sexual behavior, sexual attraction, and sexual identity among males and females aged 15–44 years in the United States found that 12% of women and 5.8% of men reported any same-sex contact in their lifetimes.³⁸ The overrepresentation of sexual minorities in our sample can confine generalizability of the study findings. Third, female respondents were more than male ones in this study (62.4% vs. 36.2%). Men were less likely to support same-sex marriage and exhibited a more negative attitude toward LGB rights.^{9–12} It is possible that men have less motivation to respond to the Facebook online survey on the issue of sexual minority to prevent expressing negative attitude. However, it warrants further study to examine the etiology of the low response rate in men. Fourth, information relating to political and religious beliefs was not available in the current study. We could not evaluate the effects of such beliefs on the association between mental health and attitude toward same-sex marriage.

Conclusions

Our findings suggest that people with poor mental health were less likely to support same-sex marriage. This association between poor mental health and a negative attitude toward same-sex marriage was particularly observed in older and heterosexual men. The cross-sectional study design limited the possibility to determine the causal relationship between mental health and attitude toward same-sex marriage. Further studies are necessary to clarify whether an improvement in perceived mental health for a specific subgroup of the population may change their attitude toward homosexuality and same-sex marriage. Moreover, Taiwan's constitutional court has directed that same-sex marriage should be legislated before May 2019. Further studies are necessary to clarify the imaginary and real impacts of same-sex marriage on mental health, especially in heterosexual and older population to provide the basis for developing strategies to prevent mental health problems in these groups.

Conflicts of interest

The authors have no conflicts of interest relevant to this article.

Source of funding

This study was partially supported by the grant MOST 104-2314-B-037-024-MY3 awarded by the Ministry of Science and Technology, Taiwan, R.O.C., and the grant KMUH104-4R60, KMUH105-5R59 and KMUH106-6R67 awarded by Kaohsiung Medical University Hospital.

References

- Gonzales G. Same-sex marriage—a prescription for better health. *N Engl J Med* 2014;**370**:1373–6.
- Hsu CY, Yen CF. Taiwan: pioneer of the health and well-being of sexual minorities in Asia. *Arch Sex Behav* 2017;**46**:1577–9.
- Raifman J, Moscoe E, Austin SB, McConnell M. Difference-in-differences analysis of the association between state same-sex marriage policies and adolescent suicide attempts. *JAMA Pediatr* 2017;**171**:350–6.
- Tatum AK. The interaction of same-sex marriage access with sexual minority identity on mental health and subjective wellbeing. *J Homosex* 2017;**64**:638–53.
- van der Star A, Bränström R. Acceptance of sexual minorities, discrimination, social capital and health and well-being: a cross-European study among members of same-sex and opposite-sex couples. *BMC Publ Health* 2015;**15**:812.
- Moskowitz DA, Rieger G, Roloff ME. Heterosexual attitudes towards same-sex marriage. *J Homosex* 2010;**57**:325–36.
- Meyer IH. Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: conceptual issues and research evidence. *Psychol Bull* 2003;**129**:674–97.
- Newcomb ME, Mustanski B. Internalized homophobia and internalizing mental health problems: a meta-analytic review. *Clin Psychol Rev* 2010;**30**:1019–29.
- Deng XR. A study on legalization of same-sex marriage in taiwan. 2014. Retrieved from, <http://www.moj.gov.tw/ct.asp?xItem=329314&ctNode=36912&mp=095>.
- Jakobsson N, Kotsadam A, Jakobsson SS. Attitudes toward same-sex marriage: the case of Scandinavia. *J Homosex* 2013;**60**:1349–60.
- Schwartz J. Investigating differences in public support for gay rights issues. *J Homosex* 2010;**57**:748–59.
- Smith JF. Same-sex marriage attitudes during the transition to early adulthood: a panel study of young australians, 2008 to 2013. *J Fam Issues* 2016;**37**:2163–88.
- Bolte A. Do wedding dresses come in lavender? The prospects and implications of same-sex marriage. *Soc Theor Pract* 1998;**24**:111–31.
- Su D, Irwin JA, Fisher C, Ramos A, Kelley M, Mendoza DAR, et al. Mental health disparities within the LGBT population: a comparison between transgender and nontransgender individuals. *Transgend Health* 2016;**1**:12–20.
- Ramo DE, Rodriguez TM, Chavez K, Sommer Prochaska JJ. Facebook recruitment of young adult smokers for a cessation trial: methods, metrics, and lessons learned. *Internet Interv* 2014;**1**:58–64.
- Bowen AM, Daniel CM, Williams ML, Baird GL. Identifying multiple submissions in Internet research: preserving data integrity. *AIDS Behav* 2008;**12**:964–73.
- Lee MB, Liao SC, Lee YJ, Wu CH, Tseng MC, Gau SF, et al. Development and verification of validity and reliability of a short screening instrument to identify psychiatric morbidity. *J Formos Med Assoc* 2003;**102**:687–94.
- Baron RM, Kenny DA. The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *J Pers Soc Psychol* 1986;**51**:1173–82.

19. Aiken L, West S. *Multiple regression: testing and interpreting interaction*. Newbury Park: Sage Publication; 1991.
20. van der Toorn J, Jost JT, Packer DJ, Noorbaloochi S, Van Bavel JJ. In defense of tradition: religiosity, conservatism, and opposition to same-sex marriage in North America. *Pers Soc Psychol Bull* 2017;**43**:1455–68.
21. Merino SM. Contact with gays and lesbians and same-sex marriage support: the moderating role of social context. *Soc Sci Res* 2013;**42**:1156–66.
22. Schulte LJ, Battle J. The relative importance of ethnicity and religion in predicting attitudes towards gays and lesbians. *J Homosex* 2004;**47**:127–42.
23. Xie Y, Peng M. Attitudes towards homosexuality in China: exploring the effects of religion, modernizing factors, and traditional culture. *J Homosex* 2018;**65**:1758–87.
24. Lottes IL, Kuriloff PJ. The effects of gender, race, religion, and political orientation on the sex role attitudes of college freshmen. *Adolescence* 1992;**27**:675–88.
25. Jost JT, Glaser J, Kruglanski AW, Sulloway FJ. Political conservatism as motivated social cognition. *Psychol Bull* 2003;**129**:339–75.
26. Wojcik SP, Hovasapian A, Graham J, Motyl M, Ditto PH. Conservatives report, but liberals display, greater happiness. *Science* 2015;**347**:1243–6.
27. Amodio DM, Jost JT, Master SL, Yee CM. Neurocognitive correlates of liberalism and conservatism. *Nat Neurosci* 2007;**10**:1246–7.
28. Ernst M, Paulus MP. Neurobiology of decision making: a selective review from a neurocognitive and clinical perspective. *Biol Psychiatry* 2005;**58**:597–604.
29. Hatzenbuehler ML, Dovidio JF, Nolen-Hoeksema S, Phillips CE. An implicit measure of anti-gay attitudes: prospective associations with emotion regulation strategies and psychological distress. *J Exp Soc Psychol* 2009;**45**:1316–20.
30. Amadio DM. Internalized heterosexism, alcohol use, and alcohol-related problems among lesbians and gay men. *Addict Behav* 2006;**31**:1153–62.
31. Cheng YA, Wu FCF, Adamczyk A. Changing attitudes toward homosexuality in Taiwan, 1995–2012. *Chin Sociol Rev* 2016;**48**:317–45.
32. Herek GM. Gender gaps in public opinion about lesbians and gay men. *Publ Opin Q* 2002;**66**:40–66.
33. Wu CY, Lee MB, Liao SC, Chang LR. Risk factors of internet addiction among internet users: an online questionnaire survey. *PLoS One* 2015;**10**:e0137506.
34. Chen MJ, Weng SS. Psychological symptoms among hospital nurses in Taiwan: a cross sectional study. *BMC Women's Health* 2017;**17**:101.
35. Bobkowski P, Smith J. Social media divide: characteristics of emerging adults who do not use social network websites. *Media Cult Soc* 2013;**35**:771–81.
36. Thornton L, Batterham PJ, Fassnacht DB, Kay-Lambkin F, Calear AL, Hunt S. Recruiting for health, medical or psychosocial research using Facebook: systematic review. *Internet Interv* 2016;**4**:72–81.
37. Whitaker C, Stevelink S, Fear N. (2017) the use of Facebook in recruiting participants for health research purposes: a systematic review. *J Med Internet Res* 2017;**19**:e290.
38. Chandra A, Mosher WD, Copen C, Sionean C. Sexual behavior, sexual attraction, and sexual identity in the United States: data from the 2006–2008 National survey of family growth. *Natl Health Stat Report* 2011;**36**:1–36.