



The effect of media reporting of a homicide committed by a patient with schizophrenia on the public stigma and knowledge of psychosis among the general population of Hong Kong

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Abstract

Purpose This study aimed to investigate the effects of media reporting of a homicide committed by a patient with schizophrenia on the knowledge about and stigma regarding psychosis among the general Hong Kong population. The effects of using the term ‘schizophrenia (jing-shen-fen-lei)’ in the news on the perceptions of the new Chinese term ‘psychosis (si-jue-shi-tiao)’ were explored.

Methods Random telephone surveys of the general Hong Kong population were conducted in April 2009 (1 month before the incident) and June 2009 (1 week after the incident). Stigma was measured with the Link’s Perceived Discrimination-Devaluation Scale (LPDDS). Knowledge about the symptoms, treatment and belief of dangerousness of psychosis were assessed. The emotional reaction of the public to the news was explored, and its effects on knowledge and stigma were studied.

Results Overall, 1016 and 506 participants completed the two surveys. More participants in the post-incident survey agreed that people with psychosis are dangerous to the public ($\chi^2 = 4.934, p = 0.026$). However, no significant differences were observed in the LPDDS scores. Participants who reported a high level of distress related to the news were more likely to perceive people with psychosis as dangerous to the public ($\chi^2 = 6.738, p = 0.009$). Women and older people reported greater distress.

Conclusions These findings suggest that media reporting of violent incidents involving people with schizophrenia increases the public belief in the dangerousness of people with psychosis but not the overall stigma. Further studies of the differential effects of violence reporting on public perceptions about people with psychosis and schizophrenia are warranted.

Keywords Media report violent · Dangerous · Public stigma · Psychosis

Introduction

Public stigma is among the most salient barriers to the recovery of people with psychosis and often has negative psychological effects on both patients and their caregivers [1, 2]. Media reports of violence committed by people with mental illnesses have been suggested as a potent contributor to increased public stigma [3]. Experimental studies of

adolescents have suggested a link between the media portrayal of violence committed by patients with mental illness and increased social stigma [4, 5]. However, these studies involved restricted populations and small sample sizes. Population studies of the cross-sectional associations between public stigma and the recall of non-specific news or media exposure have identified an association between media exposure and increased stigma [6, 7]. However, the cross-sectional methodology used in those studies has limited causal interpretations. Additionally, few longitudinal population studies have addressed the effects of media reporting about violent incidents on the stigma and knowledge regarding mental illness among the public.

Angermeyer and Matschinger [8] were among the first to report a population study of the direct effects of media reports of violent incidents on public stigma in Germany. In this study, the reported incident involved a patient with

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schizophrenia who attacked prominent German politicians. A comparison of pre-incident and post-incident survey responses suggested a significant increase in the social distance of the public towards people with schizophrenia, as well as an increase in the public belief that patients with psychiatric conditions were ‘dangerous’ and ‘unpredictable’. In an incident in 2015, a co-pilot with reported depression crash-landed a Germanwings passenger airplane, causing the deaths of 150 people. The results of online public surveys conducted before and after the incident suggested that an increased proportion of the German public perceived patients with mental illnesses as unpredictable after the incident, but the difference over time was small [9]. Although the latter German study involved a news incident regarding a patient with depression, the results suggest that the effects of news reporting on changes in public attitudes could be generalised to patients with other mental illness, such as schizophrenia.

The few existing studies suggest that media reports of violence committed by patients with mental illness affect certain stereotypes about patients with psychiatric conditions, such as ‘dangerousness’, although reports of the effects on overall stigma were inconsistent. Beliefs about dangerousness may be more sensitive than overall stigma to changes in one’s response to a news report of violence committed by a patient with mental illness. Furthermore, the inclusion of a wide scope of mental conditions in previous public surveys may have contributed to the inconsistent results regarding the effect of stigma. Additionally, the methodology applied to previous online surveys may have disproportionately reflected the attitudes of people with higher education levels [9]. Finally, to the best of our knowledge, no similar studies have been conducted in countries or regions other than Germany.

Analyses of news coverage in different countries have consistently reported a disproportional association of people with schizophrenia with dangerousness [10–12]. Specifically, studies have suggested that schizophrenia and other psychotic disorders are more stigmatised, compared to other mental disorders [13, 14]. In many South Asian regions and countries, efforts to tackle the stigma against schizophrenia have included a change to a new, less-stereotyped name for the condition, coupled with well-coordinated efforts to educate the public about the illness [15–17]. This approach has also been suggested as a potential strategy for other countries [18]. Studies of newspaper coverage in Hong Kong and Japan found that use of a new name for schizophrenia or psychosis was less associated with dangerousness and other negative aspects [19, 20]. Accordingly, most South Asian regions have adopted a new name to replace the old translation of schizophrenia. In Hong Kong, although a new Chinese translation for psychosis (si-jue-shi-tiao) was developed in 2001, the Chinese name for schizophrenia

(jing-shen-fen-lie) was not changed [17]. The new Chinese name for psychosis was introduced to the public as a milder and earlier stage of severe mental illnesses such as schizophrenia. Although both names have been used in the media in parallel, schizophrenia has been used more frequently and with a more negative stereotype, compared with the Chinese name for psychosis [20]. Accordingly, the effects of the term schizophrenia (jing-shen-fen-lie), when used in media reports of violence, on the public perception of psychosis (si-jue-shi-tiao) remain unknown.

Most studies in the field explored only stigma or attitudes. However, previous research has suggested a link between knowledge and stigma about schizophrenia [21, 22]. Furthermore, the effect of a violent incident on the public is likely to occur in the context of other relevant activities, such as public mental health education programmes. Therefore, the public might seek additional information regarding the illness after an incident. Accordingly, it would also be important to explore changes in knowledge about the relevant mental illness after an incident.

On 29 May 2009, a patient with diagnosed schizophrenia killed a 4-year-old boy and severely injured the boy’s father in an unprovoked incident in Hong Kong. The news was reported on the front pages of major local newspapers under the headline ‘madman knifed a 4-year-old child to death’, along with photos of the suspect being arrested by police and the child in an ambulance with the weapon. Animations were also printed to reconstruct the sequence of the incident. Additionally, the articles used the terms ‘madness’ and ‘schizophrenia (jing-shen-fen-lie)’ instead of ‘psychosis (si-jue-shi-tiao)’. A general population survey regarding knowledge and stigma about psychosis had been conducted approximately one month before the incident (25 March–17 April 2009) [21]. In light of this incident, a second general population survey was conducted one week after the incident (4 June–7 June 2009) using the same methodology, with the aim of evaluating the effects of media reporting of violent incidents committed by people with schizophrenia on knowledge and stigma about psychosis in Hong Kong.

Methods

Study design and sample

Two general population telephone surveys were conducted in Hong Kong during April and June 2009. Both surveys used the same methodology to allow for comparison. The first (i.e., pre-incident) survey was conducted between 25 March and 17 April 2009, and the details of the sampling methods were reported previously [21]. The second (i.e., post-incident) survey was conducted one week after the incident between 4 and 7 June 2009. Both surveys used the

Web-based Computer-Assisted Telephone Interview (Web-CATI) system and were conducted by 50 trained interviewers. All interviewers participated in a 2-h training session to ensure an understanding of the questionnaire, align their approaches to interviewing and standardise completion of the questionnaire. Ongoing on-site supervision was provided, and audio recording and screen capture were used to ensure data quality.

For the survey, a list of telephone numbers was generated randomly, and each number was called up to five times before being marked as unreachable. The inclusion criteria were Hong Kong residency, ability to speak Cantonese and aged 18 years or older. One qualified member per successfully reached household was invited to participate in the interview. If more than one qualified member resided in the household, the resident with the birthday closest to the interview date was selected. A follow-up appointment was made if the selected member was not available at the time of the call. All interviews were recorded by the system, and audio clips of 76 (7.4%) and 36 cases (7.1%) from the pre-incident and post-incident surveys, respectively, were randomly selected for verification by the research team to ensure data quality. The average length of the interview was 14.5 min, as determined by the Web-CATI system. The response rates of 65.8% for the pre-incident survey and 66.6% for the post-incident survey were calculated based on the international standard proposed by the American Association for Public Opinion Research. Data collected by interviewers with an individual response rate of less than 40% were excluded to eliminate any possible sample bias. The study protocol was reviewed and approved by the Institutional Review Board of the University of Hong Kong/Hospital Authority Hong Kong West Cluster.

Assessments

The participants' demographic information, including age, gender and education level, was recorded. At the end of the post-incident survey, the participants were asked if they had read or heard any news about a homicide committed by a patient with schizophrenia within 1 month of the day of the interview.

Questions regarding the participants' knowledge about psychosis were minimised to limit the total telephone interview duration. Four questions intended to assess basic literacy about psychosis were selected from reports by Stuart and Arboleda-Florez [23] and Compton, Quintero and Esterberg [24]. Knowledge about symptoms was assessed using a multiple-choice question: 'What is the most common symptom of psychosis?' Participants were asked to choose the best answer out of five options. Knowledge about treatment, illness and the perceived association with violence, as well as the availability of psychiatric services in

the community, were assessed using three statements: 'People with psychosis need prescribed medication to control their symptoms', 'People with psychosis are dangerous to the public because of their violent behaviour' and 'People with psychosis do not receive sufficient medical or social services'. Participants were asked to report the extent of their agreement with these statements using a four-point Likert scale (1. Strongly agree; 2. Somewhat agree; 3. Somewhat disagree; 4. Strongly disagree).

The revised Link's Perceived Discrimination-Devaluation Scale (LPDDS) was used to assess public stigma [25]. This questionnaire includes 13 items that inquire about the extent of agreement with different statements and indicate the devaluation of people with psychosis exhibited by most people (sample item: 'Most people believe that a person with psychosis is just as intelligent as the average person'). Details of the items, scoring method and scoring results for each item on the pre-incident survey were reported in a previous study [21]. The final score was calculated by adding the sub-scores from each item, which ranged from 1 to 4, and dividing the total by 13. A lower score indicates a less stigmatising attitude. All scales used in the current study were subjected to a standard translation procedure which involved translating the questionnaire from English to Chinese by a bilingual researcher with experience in translation. The Chinese questionnaire was then back-translated to English by different bilingual researchers without any knowledge of the original English version. The back-translated and original versions were then compared by three different researchers affiliated with the project to check for equivalence in meanings. No significant difference in meaning was detected between the two versions, and the translated Chinese version was adopted. The Cronbach's alpha of the Chinese LPDDS scale was 0.76.

The emotional responses of those who reported that they were aware of the homicide incident were then assessed using a five-point Likert scale (1. not distressed at all; 2. slightly distressed; 3. moderately distressed; 4. fairly distressed; 5. extremely distressed).

Statistical analysis

SPSS version 24 was used for the statistical analysis. Only participants who acknowledged hearing about the homicidal incident during the post-incident survey were included in the final analysis. The demographics (including age, gender and education level) of both the pre-incident and post-incident samples were weighted using a rim-weighting method to match the corresponding distribution of the Hong Kong population as reported in the 2006 census population. The Kolmogorov–Smirnov test was used to evaluate data normality. The Chi-square test was used to compare the difference in knowledge about psychosis between the pre-incident and

post-incident samples. The Mann–Whitney U test was used to test the difference in public stigma (i.e., LPDDS score) between the two samples because of the non-parametric nature of the data. The post-incident sample was divided into two groups based on the emotional response (i.e., reported level of distress) to the homicidal incident assessment according to the five-point Likert scale. Those who reported feeling very or extremely distressed by the incident were classified into one group, while the others were classified into the other group. A binary logistic regression was used to explore the demographic factors predictive of the emotional response, and the Chi-square and Mann–Whitney U tests were used to explore the effects of the emotional response on knowledge items and stigma. The Benjamini–Hochberg procedure was used for multiple testing correction.

Results

A total of 1016 participants were interviewed during the pre-incident survey in May 2009, while 506 were interviewed during the post-incident survey in June 2009. Of the latter, 93.9% ($n=475$) of participants acknowledged hearing about the homicide and were, therefore, included in the final analysis. In the pre-incident survey, participants had a mean age of 45.18 years [standard deviation (SD)=16.28], and 45.7% were male. In the post-incident survey, participants had a mean age of 43.76 years (SD=14.65), and 43.8% were male. Table 1 compares the demographic information from the pre-incident and post-incident samples. All data were weighted according to age,

gender and educational level data from the Hong Kong census report of 2006. There were no significant differences in demographics between the two survey populations (Table 1).

Comparison of knowledge and stigma between the pre-incident and post-incident surveys

Significantly more participants in the post-incident survey believed that people with psychosis are more dangerous to the public because they exhibit violent behaviour ($\chi^2=4.93$, $p=0.03$) and require prescribed medications to control symptoms ($\chi^2=4.65$, $p=0.03$) and that services for people with psychosis are insufficient ($\chi^2=4.22$, $p=0.04$). However, the two survey populations did not differ in terms of knowledge about the common symptoms of psychosis. Details of this analysis are presented in Table 2. The mean LPDDS scores in the pre-incident and post-incident surveys were 2.64 (SD=0.49) and 2.63 (SD=0.49), respectively, and the difference was insignificant ($U=208461.5$, $p=0.76$) (Table 2).

Emotional response towards the homicidal incident

After reading news coverage about the homicidal incident, 49.1% ($n=233$) of the participants reported feeling very or extremely distressed, whereas 50.9% ($n=242$) reported feeling no or only mild distress.

Table 1 Demographic comparison between pre-incident survey ($N=1016$) and post-incident survey ($N=475$) after weighing

	Pre-incident survey		Post-incident survey		Population (%)	χ^2	p
	Unweighted	Weighted	Unweighted	Weighted			
Gender, n (%)						1.420	0.233
Male	464 (45.7)	460 (45)	208 (43.8)	192 (41.6)	47.7		
Age group, n (%)						4.464	0.485
18–19	139 (13.7)	17 (1.7)	62 (13.1)	7 (1.5)	3.03		
20–29	147 (14.5)	112 (10.9)	60 (12.7)	49 (10.7)	17.2		
30–39	115 (11.3)	160 (15.7)	29 (6.1)	71 (15.6)	19.9		
40–49	225 (22.1)	211 (20.6)	134 (28.4)	99 (21.7)	23.5		
50–59	180 (17.7)	201 (19.7)	118 (25)	107 (23.5)	16.9		
>60	210 (20.7)	321 (31.4)	69 (14.6)	123 (27)	19.4		
Education, n (%)						1.698	0.637
Primary or below	162 (15.9)	416 (40.7)	68 (14.3)	172 (37.4)	42		
Secondary	468 (46.2)	457 (44.8)	225 (47.4)	214 (46.5)	41.7		
Matriculation	83 (8.2)	40 (3.9)	49 (10.3)	21 (4.6)	5.1		
Tertiary or above	300 (29.6)	108 (10.6)	133 (28.0)	53 (11.5)	11.2		

Weighing of gender, age group and education were based on by-census data in 2006

Chi square test was conducted to compare the pre-incident and post-incident survey after weighing

χ^2 Chi-square test, p p value

Table 2 Comparison between pre-incident survey ($N=1016$) and post-incident survey ($N=475$) on knowledge about psychosis

	Pre-incident survey	Post-incident survey	χ^2/U	<i>p</i>
Knowledge (agree, <i>n</i> %)				
“The most common symptom of psychosis is?” (Correct, <i>n</i> ,%)	430 (42.3)	216 (45.5)	3.01	0.08
“Need prescription of medication to control their symptoms”	885 (87.1)	416 (87.6)	4.65	0.03
“Are dangerous to the public because of violent behavior”	397 (39.1)	207 (43.6)	4.93	0.03
“Not having sufficient medical or social caring services”	691 (68.0)	333 (70.1)	4.22	0.04
LPDDS (mean, SD)	2.64 (0.49)	2.63 (0.49)	208461.5	0.76

Statistically significant *p* values are in bolditalic ($p < 0.05$)

LPDDS Link’s Perceived Devaluation and Discrimination Scale, χ^2 Chi square test, *U* Mann–Whitney test, *SD* standard deviation, *p* *p* value

Table 3 Comparison of knowledge about psychosis between the distressed and non-distressed group of the post-incident survey sample

	Not distressed ($n=242$)	Very distressed ($n=233$)	χ^2/U	<i>p</i>
Knowledge (agree, <i>n</i> %)				
“The most common symptom of psychosis is?” (Correct, <i>n</i> ,%)	128 (52.9)	121 (51.9)	0.04	0.83
“Need prescription of medication to control their symptoms”	211 (87.9)	213 (91.4)	1.56	0.21
“Are dangerous to the public because of violent behavior”	79 (32.8)	103 (44.4)	6.74	0.009
“Not having sufficient medical or social caring services”	169 (70.4)	169 (73.5)	0.55	0.46
LPDDS (mean, SD)	2.600 (0.48)	2.652 (0.50)	23058.5	0.28

Statistically significant *p* value is in bold ($p < 0.01$)

LPDDS Link’s Perceived Devaluation and Discrimination Scale, χ^2 Chi-square test, *U* Mann–Whitney test, *SD* standard deviation, *p* *p* value

Effect of the emotional response on knowledge and public stigma about psychosis

Compared with participants who were not distressed, those who reported feeling very distressed were more likely to agree that people with psychosis were dangerous to the public because of their violent behaviour ($\chi^2=6.74, p=0.009$) (Table 3). No differences in other knowledge items were observed with respect to the level of distress. The mean LPDDS scores of participants who did not feel distressed and those who felt very distressed were 2.60 (SD = 0.48) and 2.65 (SD = 0.50), respectively, and this difference was insignificant ($U=23058.5, p=0.28$).

Demographic determinants of emotional responses towards the incident

A binary logistic regression analysis was performed to explore the determinants of distress after reading news about the violent incident (Table 4). Notably, gender was a significant predictor of the level of distress experienced after reading the news. Specifically, female participants were more likely to report feeling distress [Exp (B)=1.63, 95%

Table 4 Logistic regression of the demographic predictors of distress after reading the news

Variables	<i>B</i>	<i>SE</i>	Wald	Exp (B)	95% CI
Gender ^a	0.46	0.21	4.79*	1.58	1.05–2.37
Age	0.02	0.008	5.78*	1.02	1.004–1.04
Education			4.10		
Primary or below	0.27	0.38	0.51	1.31	0.63–2.75
Secondary	0.51	0.26	3.89	1.67	1.003–2.78
Matriculation	0.26	0.37	0.47	1.29	0.62–2.68
Tertiary or above ^b	–	–	–	–	–

B regression coefficient, *SE* standard error, 95% *CI* 95% confidence interval

* $p < 0.05$

^aMale as reference group

^bReference group

confidence interval (CI) 1.07–2.47, $p=0.02$]. Older participants were also significantly more likely to report distress after reading the news [Exp (B)=1.02, 95% CI 1.00–1.04, $p=0.03$]. The model itself was significant (omnibus Chi square = 20.06, $p=0.003$).

Discussion

To our knowledge, this is the first study to evaluate the effects of a media report of a violent incident committed by a patient with schizophrenia on the knowledge and stigma about psychosis in a Chinese population. The results of this study reveal that after the incident, a larger proportion of the public with awareness about the reported incident believed that people with psychosis are dangerous and require prescribed medication and that treatment facilities are insufficient. However, no significant change in the overall level of stigma was observed. Approximately half of the interviewees reported experiencing distress related to the incident, and the level of distress was found to correlate with a belief in the dangerousness of people with psychosis. Additionally, female and older participants were more likely to report being distressed.

The belief that people with schizophrenia are dangerous is prevalent among the public, with reported rates of 20.4–72.1% [26]. In the current study, the two surveys were conducted at an interval of two months, using the same methodology, and only participants who acknowledged reading news about the homicidal incident during the post-incident survey were included in the analysis. The finding that the pre-incident and post-incident samples did not differ in terms of basic demographics suggested that the media report of the violent incident might have accounted for the increase in the belief that people with psychosis are dangerous. These results were consistent with those of previous studies conducted in the German population [8, 9].

Additionally, no change in overall stigma was observed in this study, consistent with a previous German report which reported an increased perception of dangerousness after the media report of a violent incident without a change in stigma associated with the mental illness [9]. One possible explanation is that the term ‘psychosis’ was used in the surveys, whereas news reports of this incident used the term ‘schizophrenia’. In other words, the public understandings of psychosis and schizophrenia may be distinct, and thus a negative incident involving a patient with schizophrenia might not affect attitudes towards psychosis. However, the public stigma regarding mental illness involves complex components that have been formed over a long period and are unlikely to change significantly in response to a single incident. Notably, a previous study found that the newer Chinese name for psychosis (si-jue-shi-tiao) was viewed more positively than the Chinese name for schizophrenia (jing-shen-fen-lie) [20], suggesting that the public stigma associated with the former term is only minimally influenced by media reports in which the latter term is used. Perceptions of “psychosis” might,

therefore, be protected from the negative effects of media reporting. However, the perception of dangerousness is less illness-specific and might be more sensitive to media reports of violence. Further studies that simultaneously explore in detail the stigma associated with both names are needed.

In this study, significantly more participants in the post-incident survey agreed that people with psychosis require treatment with prescribed medication and that the available treatment resources were insufficient. Possibly, a belief in the dangerousness of people with psychosis has led to the perception that more intensive treatment is needed. By contrast, no significant differences were observed in terms of knowledge about the symptoms of psychosis between the pre-incident and post-incident surveys. Most of the news report did not have education component on symptoms and treatment of the illness. This might have contributed to the lack of change of knowledge. However, such knowledge might also be influenced indirectly by other related activities after an incident, such as self-searching of mental health information or public educational programmes organised by different professional parties. However, this information was not collected in the current study, and it was, therefore, difficult to draw conclusions about this relationship.

The results of the current study further suggest that approximately half of the interviewed participants were very distressed by the media report of the violent incident, and that these participants were more likely to hold the belief that people with psychosis are dangerous. It is possible that the relationship between negative emotions and negative attitudes towards patients with mental illness is bidirectional. Link and colleague [27] suggested that people with mental illness elicit negative emotions because they are perceived as ‘threatening and unpredictable’. Moreover, an experimental study suggested that negative emotional reactions towards a person with mental illness predict greater social distance [28]. Further studies could explore the effect of emotional reactions towards people with psychosis on changes in attitude. Significantly, female and older participants were more likely to report feelings of distress in this study. Other studies have reported that female participants exhibited greater fear towards people with mental illness and were likely to express a higher level of stigma towards people with mental disorders [29, 30]. Women may have a greater sense of self-perceived vulnerability to victimisation [31, 32], which might not be specific towards people with psychosis. This perceived vulnerability may also apply to older populations [33]. The news reports associated with the current study used sensational words such as ‘madman’ and included animated comics to recapture the sequence of the incident. These factors were likely to have exacerbated the potential distress caused by the news content.

Selective media reports of violence committed by people with mental illnesses and the reporting style have been identified as possible contributors to public stigma [34]. Indeed, the current study suggested that the media representation of violence by a person with schizophrenia could negatively influence public beliefs. Evidence suggesting the effects of media reports on public perceptions of mental illnesses have led to suggestions regarding the implementation of public policy and media monitoring [8, 35], including the use of factual language and the inclusion of a report regarding mental health education alongside news reports of violent incidents. Unlike many Western countries, however, no relevant media-reporting policies or advocating organisations are available locally to provide guidance. Future efforts may include working with journalists and relevant stakeholders to develop local media reporting guidelines.

The results of the current study should be considered in light of the following limitations. First, although surveys were conducted at two time points, the lack of a within-subject comparison makes it difficult to draw conclusions about causality. Furthermore, although the two surveys were temporally close to each other, changes in attitude may be attributable to other factors such as other news reports about mental illness. In addition, multiple reports from multiple sources covered the same incident, and the accuracy of information and level of sensationalism in each report were likely to vary. However, the current study did not consider the quality of the sources of information received by the participants. Finally, only the Chinese translation of psychosis (si-jue-shi-tiao) was used in the survey, whereas the Chinese translation of schizophrenia (jing-shen-fen-lie) was used in most of the news reports. Therefore, it was not possible to draw conclusions on the differential effects of violence reporting on psychosis (si-jue-shi-tiao) and schizophrenia (jing-shen-fen-lie). This factor also limited the interpretation of the results regarding the relationship between the news and the observed changes.

Despite these limitations, this study observed an increase in public beliefs regarding the dangerousness of people with psychosis following media reports of a violent incident involving a person with schizophrenia. This finding highlights the urgent need to establish public policy regarding the media reporting of mental illness in this region. However, the overall stigma regarding mental illness in the current population did not increase after exposure to the media reports. Further studies are needed to explore the differential effects of violence reporting on public perceptions of people with psychosis and schizophrenia.

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Compliance with ethical standards

Conflict of interest All authors of the study report no conflict of interest.

References

1. Sartorius N (1998) Stigma: what can psychiatrists do about it? *Lancet* 352:1058–1059
2. Wahl OF (2012) Stigma as a barrier to recovery from mental illness. *Trends Cogn Sci* 16:9–10
3. Link BG, Stuart H (2017) On revisiting some origins of the stigma concept as it applies to mental illnesses. In: Gaebel W, Rössler W, Sartorius N (eds) *The stigma of mental illness—end of the story?* Springer International Publishing, Cham, pp 3–28
4. Dietrich S, Heider D, Matschinger H, Angermeyer MC (2006) Influence of newspaper reporting on adolescents' attitudes toward people with mental illness. *Soc Psychiatry Psychiatr Epidemiol* 41:318–322
5. Wahl OF, Lefkowitz JY (1989) Impact of a television film on attitudes toward mental illness. *Am J Community Psychol* 17:521–528
6. Angermeyer MC, Dietrich S, Pott D, Matschinger H (2005) Media consumption and desire for social distance towards people with schizophrenia. *Eur Psychiatry* 20:246–250
7. Morgan AJ, Jorm AF (2009) Recall of news stories about mental illness by Australian youth: associations with help-seeking attitudes and stigma. *Aust N Z J Psychiatry* 43:866–872
8. Angermeyer MC, Matschinger H (1996) The effect of violent attacks by schizophrenic persons on the attitude of the public towards the mentally ill. *Soc Sci Med* 43:1721–1728
9. Schomerus G, Stolzenburg S, Angermeyer MC (2015) Impact of the Germanwings plane crash on mental illness stigma: results from two population surveys in Germany before and after the incident. *World Psychiatry* 14:362–363
10. Thornicroft A, Goulden R, Shefer G et al (2013) Newspaper coverage of mental illness in England 2008–2011. *Br J Psychiatry Suppl* 55:s64–9
11. Goulden R, Corker E, Evans-Lacko S et al (2011) Newspaper coverage of mental illness in the UK, 1992–2008. *BMC Public Health* 11:796
12. Dubugras MTB, Evans-Lacko S, Mari J de J (2011) A two-year cross-sectional study on the information about schizophrenia divulged by a prestigious daily newspaper. *J Nerv Ment Dis* 199:659–665
13. Schomerus G, Schwahn C, Holzinger A et al (2012) Evolution of public attitudes about mental illness: a systematic review and meta-analysis. *Acta Psychiatr Scand* 125:440–452
14. Pescosolido BA, Martin JK, Long JS et al (2010) “A disease like any other”? A decade of change in public reactions to schizophrenia, depression, and alcohol dependence. *Am J Psychiatry* 167:1321–1330
15. Sato M (2006) Renaming schizophrenia: a Japanese perspective. *World Psychiatry* 5:53–55
16. Lee YS, Kim J-J, Kwon JS (2013) Renaming schizophrenia in South Korea. *Lancet* 382:683–684
17. Chiu CP-Y, Lam MM-L, Chan SK-W et al (2010) Naming psychosis: the Hong Kong experience. *Early Interv Psychiatry* 4:270–274
18. Sartorius N, Chiu H, Heok KE et al (2014) Name change for schizophrenia. *Schizophr Bull* 40:255–258
19. Aoki A, Aoki Y, Goulden R et al (2016) Change in newspaper coverage of schizophrenia in Japan over 20-year period. *Schizophr Res* 175:193–197

20. Chan SKW, Ching EYN, Lam KSC et al (2017) Newspaper coverage of mental illness in Hong Kong between 2002 and 2012: impact of introduction of a new Chinese name of psychosis. *Early Interv Psychiatry* 11:342–345
21. Chan SKW, Tam WWY, Lee KW et al (2016) A population study of public stigma about psychosis and its contributing factors among Chinese population in Hong Kong. *Int J Soc Psychiatry* 62:205–213
22. Kvaale EP, Haslam N, Gottdiener WH (2013) The ‘side effects’ of medicalization: a meta-analytic review of how biogenetic explanations affect stigma. *Clin Psych Rev* 33:782–794
23. Stuart H, Arboleda-Flórez J (2001) Community attitudes toward people with schizophrenia. *Can J Psychiatry* 46:245–252
24. Compton MT, Quintero L, Esterberg ML (2007) Assessing knowledge of schizophrenia: development and psychometric properties of a brief, multiple-choice knowledge test for use across various samples. *Psychiatry Res* 151:87–95
25. Link BG, Struening EL, Neese-todd S et al (2002) On describing and seeking to change the experience of stigma. *Psychiatr Rehabil Skills* 6:201–231
26. Jorm AF, Reavley NJ, Ross AM (2012) Belief in the dangerousness of people with mental disorders: a review. *Aust N Z J Psychiatry* 46:1029–1045
27. Link BG, Phelan JC, Bresnahan M et al (1999) Public conceptions of mental illness: labels, causes, dangerousness, and social distance. *Am J Public Health* 89(9):1328–1333
28. Lauber C, Nordt C, Falcato L, Rössler W (2004) Factors influencing social distance toward people with mental illness. *Community Ment Health J* 40(3):265–274
29. Holzinger A, Floris F, Schomerus G et al (2012) Gender differences in public beliefs and attitudes about mental disorder in western countries: a systematic review of population studies. *Epidemiol Psychiatr Sci* 21:73–85
30. Chan SKW, Lee KW, Hui CLM et al (2017) Gender effect on public stigma changes towards psychosis in the Hong Kong Chinese population: a comparison between population surveys of 2009 and 2014. *Soc Psychiatry Psychiatr Epidemiol* 52:259–267
31. Hollander JA (2001) Vulnerability and dangerousness: the construction of gender through conversation about violence. *Gen Soc* 15:83–109
32. Jackson J (2009) A psychological perspective on vulnerability in the fear of crime. *Psychol Crime Law* 15:365–390
33. Russo S, Roccato M, Vieno A (2011) Predicting perceived risk of crime: a multilevel study. *Am J Community Psychol* 48(3–4):384–394
34. Klin A, Lemish D (2008) Mental disorders stigma in the media: review of studies on production, content, and influences. *J Health Commun* 13:434–449
35. Wahl OF (2003) News media portrayal of mental illness: implications for public policy. *Am Behav Sci* 46:1594–1600