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Online supplement DS1

Method

Additional information about study methods.

Procedure

Students received an information sheet and presentation about the study during a timetabled session. Consenting students completed a form about sociodemographic and course details and prior contact with people with mental illness, and were given an envelope containing their group allocation. Participating students could win one of three £50 vouchers. Students completed baseline and post-session measures immediately before and after the interventions. Follow-up questionnaires were completed 4 months later during a timetabled session, before a lecture commenced. Participants who did not attend this lecture were asked to submit their follow-up questionnaires by email or post.

Randomisation and masking

A stratified block design was used to randomise participants to the three interventions, with stratification by level of study (two strata: degree/accelerated diploma and diploma) and intended specialty (three strata). As there was no diploma in child nursing there were five strata. Within each stratum participants were allocated an intervention using randomly permuted blocks of varying size with block size also varying randomly. Opaque envelopes containing group allocation based on the randomisation list generated as described above were prepared, and sequentially numbered within each stratum. At the recruitment sessions consenting participants queued by strata and were given an envelope to open by a volunteer not part of the study team. The group randomisation information in the envelope was the number of the group (for example, group 2) and its time and location. Two students who did not attend the recruitment sessions were randomised by telephone.

Intervention and control conditions

The intended duration of each training session was 60 min plus 15 min for discussion. In the DVD and live interventions the presenters were of diverse ages, genders and ethnicities.

DVD intervention

The DVD was *Combating Stigma* produced by the mental health charity Rethink in collaboration with the Institute of Psychiatry, King's College London.[19] It consists of an introduction by a professor of psychiatry (3 min); followed by personal stories from two service users and a carer and a carer couple (7, 5, 7 and 8 min). Their stories included experiences of mental illness and wellness, life activities, mental healthcare, stigma and discrimination. The last part of the DVD (31 min) covers nine key areas: recovery, physical health, minority groups, employment, housing, suicide, dual diagnosis, medication and violent behaviour. Here short clips of service users and carers talking about their experiences in relation to these areas are shown together with factual information provided by the professor. In total four service users and five carers appeared in the DVD. The DVD was followed by a researcher-facilitated discussion that lasted 10 min, making the total actual duration of the intervention 71 min.

Live intervention

The intervention was a modified version of a social contact intervention training model developed by Rethink. The services user and carer presenters all had prior experience of presenting in social contact interventions and had practice sessions with a researcher. A researcher introduced the presenters, and then the main carer and service user talked about their experiences of mental illness and wellness, life activities, mental healthcare, stigma and discrimination, each presenting for 20 min. Next the researcher presented brief information about key areas (as in the DVD) with the main presenters, one additional service user and one additional carer sharing their experiences in relation to these areas (30 min). The session ended with a 15 min researcher-facilitated discussion, in which the students asked the service users and carers questions (total actual intervention time 85 min).

Lecture control

The lecture was presented by a mental health nurse researcher with lecturing experience, but no specialised knowledge of stigma. This reflects the traditional approach that might be taken if a nursing school decided to provide additional coverage on stigma. The mental health nurse was asked to prepare a 60 min lecture covering stigma and discrimination and other aspects of mental health and to facilitate a 15 min discussion. The lecturer was an 'independent person' in that she was not part of the research team undertaking the study and was employed on a research study entirely unrelated to stigma. She had no personal or employment-related investment in demonstrating that social contact interventions are superior. She did not see the study protocol and was unaware of the study hypotheses when preparing and presenting the lecture. The lecture had interactive question and answer elements throughout, for example the lecturer asked questions of the audience such as 'What do you think of when you hear the term mental health?'. She was provided with a book on stigma[1] as source material for the lecture. The lecture contained no quotes from, or case histories of, people with mental illness or carers to ensure it contained no indirect social contact elements. The actual total length was 70 min (50 min lecture, 20 min discussion).

Measures

Knowledge-related measure

The Social Contact Intended Learning Outcomes (SCILO) schedule, which was devised specifically for this study, comprises five statements chosen because they were related to areas covered in the DVD and the live intervention or were likely to be changed by direct/indirect social contact interventions. The statements can be seen in online Table DS1 and had true/false response categories. The score is the total number of correct responses (possible scores 0–5).

Attitudinal measures

The first attitudinal measure was the Mental Illness: Clinicians Attitudes Scale (MICA), which has good psychometric properties.[22] In the present study $\alpha = 0.76$. The scale has good internal consistency ($\alpha = 0.79$) and test–retest reliability (concordance 0.80, 95% CI 0.68–0.91), and demonstrable convergent and divergent validity and responsiveness to change.[22] As it was developed for medical students minor wording changes were made for use with the present sample. The MICA has 16 items and produces an overall score with high scores representing more stigmatising attitudes. One item was inadvertently omitted from the pre- and post-session administrations of the scale, however, analyses using the follow-up data comparing the 16- and 15-item versions indicated no difference in study follow-up

findings when either version was used, and alpha values for both versions were similar at 0.76 and 0.74. Consequently, for consistency, data from the 15-item version were used for all stages of the study (correlation between 15- and 16-item scale at follow-up 0.996). The MICA items are statements with six levels of agreement/disagreement as response categories. The score is the sum of the response category scores (possible scores 15–90).

A second attitudinal measure – the Emotional Reactions to Mental Illness Scale (ERMIS)[23] – was included to complement the more cognitive MICA and because familiarity with people with mental illness is associated with positive emotions towards, and less fear of, people with mental illness.[21] The ERMIS consists of a vignette about a friend experiencing symptoms of schizophrenia, together with nine statements about feelings towards the friend, rated on a five-point scale for level of agreement. The scale has been validated by confirmatory factor analysis and was found to have three subscales: fear, prosocial emotions and anger, each with possible scores from 3 to 15. The wording of the vignette was modified slightly to make the subject of the vignette a female student.

Behaviour-related measures

We used part two of the Reported and Intended Behaviour Scale (RIBS) to assess intended behaviour. Respondents are presented with four statements: 'In the future I would be willing to live with/work with/live nearby to someone with a mental health problem' and 'continue a relationship with a friend who developed a mental health problem'. These are followed by five-point agreement/disagreement response items, with a high score reflecting greater willingness for social proximity (possible scores 4–20).

Data analysis

Missing data were prorated for the MICA, but not for other scales because of their structural and conceptual properties. The analytic strategy began with examining the characteristics of the randomised sample, and then testing for any evidence of selective attendance at the interventions using chi-squared, *t*-test and one-way ANOVA tests.

Initially, descriptive analyses were undertaken using independent *t*-tests comparing the DVD *v.* live conditions and DVD/live *v.* lecture at baseline, post-session and at follow-up, together with the corresponding means and 95% confidence intervals.

To take into account baseline levels of the outcome and make use of all data in one model we conducted longitudinal regression analyses using cross-sectional time series. The main analysis was longitudinal regression analyses using time series modelling, as detailed in the main paper. Secondary outcomes were assessed using *t*-tests, chi-squared tests and Mann–Whitney *U*-tests as appropriate. Responses to open-ended questions were categorised by theme, count data were tabulated and main patterns across groups were described narratively.

Economic analysis

The DVD retail price at the time of the analysis was £47. We have assumed a lecturer would need be present at the DVD session (1.25 h) and do 2 h of preparation (total time cost £53) making the total cost for the DVD session £100. The market cost of the live intervention is based on the charge made by the charity Rethink for an equivalent live intervention. This charge is an average of £675 per session and includes the cost of someone to introduce the session and facilitate discussion. A charge for the lecture was not available, but the cost has been estimated at £199. This is based on 1 day of preparation time and 1.25 h spent delivering the intervention for a nurse lecturer. If one intervention has lower costs and better outcomes than an alternative it is defined as 'dominant'. If it has higher costs and better outcomes an incremental cost-effectiveness ratio (the difference in costs divided by the difference in outcomes) shows the extra cost incurred to achieve an extra unit of outcome. Such ratios were calculated where relevant using the adjusted difference on the primary outcome measure as the denominator.

Table DS1 Percentages correctly answering each knowledge item in the Social Contact Intended Learning Outcomes scale by group and time point

	Baseline, % (*n*) correct			Post-session, % (*n*) correct			4-month follow-up, % (*n*) correct		
	DVD	Live	Lecture	DVD	Live	Lecture	DVD	Live	Lecture
People with severe mental illness can fully recover (true)	64.8 (46/71)	55.6 (45/81)	62.7 (37/59)	97.2 (70/72)	56.3 (45/80)	88.9 (56/63)	92.1 (58/63)	69.4 (50/72)	80.7 (46/57)
People with mental illness are more likely to be the victims of violence than perpetrators of violence (true)	80.6 (58/72)	75.3 (61/81)	75.0 (45/60)	93.0 (66/71)	93.8 (76/81)	87.3 (55/63)	85.7 (54/63)	88.7 (63/71)	89.5 (51/57)
People with schizophrenia have a split personality (false)	38.0 (27/71)	57.3 (43/75)	64.4 (38/59)	72.9 (51/70)	81.5 (66/81)	85.5 (53/62)	65.1 (41/63)	73.6 (53/72)	79.3 (46/58)
The media accurately portrays people with mental illness (false)	88.9 (64/72)	94.9 (74/78)	100 (60/60)	95.8 (68/71)	93.8 (76/81)	98.4 (60/63)	95.2 (60/63)	94.4 (68/72)	94.7 (54/57)
People with mental illness are fundamentally different from other people (false)	86.1 (62/72)	83.3 (65/78)	88.3 (53/60)	92.8 (64/69)	91.4 (74/81)	92.1 (58/63)	92.1 (58/63)	93.1 (67/72)	93.1 (54/58)

Table DS2 Multiple regression model for the Emotional Reactions to Mental Illness Scale (ERMIS)

ERMIS subscale	*n*	Coefficient	*P*
Fear			
Unadjusted	209		0.668
DVD *v.* lecture		−0.11 (−0.58 to 0.37)	
Live *v.* lecture		0.10 (−0.36 to 0.55)	
Adjusted	204		0.686
DVD *v.* lecture		−0.15 (−0.63 to 0.33)	
Live *v.* lecture		0.04 (−0.42 to 0.51)	
Prosocial			
Unadjusted	204		0.115
DVD *v.* lecture		−0.02 (−0.47 to 0.43)	
Live *v.* lecture		−0.39 (−0.82 to 0.04)	
Adjusted	199		0.242
DVD *v.* lecture		0.15 (−0.30 to 0.60)	
Live *v.* lecture		−0.20 (−0.63 to 0.23)	
Anger			
Unadjusted	204		0.765
DVD *v.* lecture		−0.12 (−0.50 to 0.25)	
Live *v.* lecture		−0.01 (−0.37 to 0.35)	
Adjusted	199		0.771
DVD *v.* lecture		−0.13 (−0.52 to 0.27)	
Live *v.* lecture		−0.01 (−0.39 to 0.37)	

Table DS3 Summary of main responses to post-session open questions on participants' views in post-session questionnaire: comparison of DVD and live groups

	Frequency of comments	
Response (categorised)	DVD (*n* = 74)	Live (*n* = 80)
What participants liked best about the session		
Hearing 'real' people	13	5
Hearing experiences 'first-hand'	2	13
Hearing service user stories	21	34
Hearing carer stories	11	25
Hearing stories (type of person unspecified)	12	25
Hearing a diversity of perspectives	19	9
Question and answer session with service users and carers	N/A	9
What participants liked least/felt could be improved about the session		
Should include coverage of other aspects of mental health or mental healthcare	36	30
Should include more different illnesses/not just focus on schizophrenia	22	5
Session should be shorter	24	6
Should have less repetition	13	5
Structure/quality should be improved	18	21
Include professional (especially nurse) experiences	12	4
Should include more, or more diverse, service users and carers	2	10

N/A, not applicable.

Table DS4 Responses to post-session question 'What type of emotions did the session you have just heard evoke in you?' by group

Response (categorised)	Frequency		
	DVD ($n = 63$)	Live ($n = 72$)	Lecture ($n = 58$)
Empathy (empathy/compassion/concern/understanding/touched/moved)	25	36	25
Sympathy (sympathy/feel sorry for/pity)	11	12	9
Sadness (sad/upset/tearful/distressed/sorrow)	34	22	8
Anger (angry/frustration/annoyed/sense of injustice/disgusted/its shameful)	15	16	7
Shock (shocked/taken aback/negatively surprised)	9	8	1
Surprise (positively surprised, amazed)	2	4	
Respect (respect/admiration/pride/awe/impressed)	1	14	
Motivated (inspired/want to help/eager/wake-up call/enthusiasm)	6	5	1
Hopeful (hope/optimistic)	9	9	
Sense of blame on behalf of self/professional/society (guilty, uncomfortable, apologetic)	1	2	2
Happy (happy/glad/positive/pleased)	8	6	3
Helpless (helpless)		2	
Interested (interested/intrigued/absorbed/enlightened/curious)	1	3	10
Reassured (reassured)			2
Other (surprised unclassifiable, humbled, caring, privileged to hear, worry)	7	6	3

Table DS5 Responses to 4-month follow-up question 'If you remember only ONE thing from the training session, what would you remember?' by group

Response (categorised)	Frequency		
	DVD ($n = 52$)	Live ($n = 63$)	Lecture ($n = 42$)
Stories	9	28	0
Service user story	2	19	
Carer story	4	4	
Stories generally	3	5	
Facts	34	28	28
People with mental illness can recover	19	7	9
Not all people with mental illness are dangerous		4	1
People with mental illness are 'still human'		3	
People with mental illness still face stigma	2	3	
Culture plays a role in mental illness		3	
Mental illness can happen to anyone	3	2	
Role of/impact on family	2	2	
Inaccuracy of media portrayals of mental illness			7
Prevalence of mental illness			5
People with mental illness are often victims of violence	1		3
Other	7	4	3
Recommendations	4	5	2
Treat people with mental illness with respect	2		
See people with mental illness as individuals	2	1	
Treat people equally regardless of mental illness		1	2
Don't stop being 'human'		2	
Families need to be listened to	1		
Other	9	2	12