BEST in Mental Health
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Best Evidence Summaries of Topics in Mental Healthcare

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Question

"In adults with anxiety and depression, how effective is laughter therapy, compared to any other intervention, in improving patient outcomes?"

Clarification of question using PICO structure

Patients: In adults with anxiety and depression
Intervention: Laughter therapy
Comparator: Any other intervention
Outcome: Improving patient outcomes

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Clinical and research implications

All four small, methodologically weak RCTs reported some data to suggest that laughter therapy may have some positive effects on measures of emotional well-being, symptoms of depression and anxiety, and sleep disturbance in elderly people with dementia. However, findings were inconsistent across studies and no reliable conclusions on the effectiveness of laughter therapy can be drawn. None of the studies included in this evidence summary were conducted in a general adult population with a diagnosis of depression and anxiety; three included only elderly participants and only one specified a diagnosis of depression as an inclusion criterion. All of the identified studies are likely to have limited generalisability to the management of anxiety and depression in a general adult population in the UK.

Further research is needed to assess the effectiveness of laughter therapy, specifically in people with diagnoses of depression and anxiety.

What does the evidence say?

Number of included studies/reviews (number of participants)

We identified three randomised controlled trials (RCTs),[1,2,4] and one cluster randomised trial,[3] with partial relevance to this evidence summary. None of the studies identified were conducted in a general adult population with a diagnosis of depression and anxiety. Only one of the four trials was conducted in a population which included only people with depression; this trial was conducted in elderly women in Iran.[4] The remaining three studies included some participants with symptoms of mild anxiety and/or depression.[1-3] Of these, one was conducted in a community-dwelling elderly population in Korea,[2] and one was conducted in elderly nursing home residents in Australia, the majority of whom were diagnosed with dementia.[3] All of the identified studies are likely to have limited generalisability to the management of anxiety and depression in a general adult population in the UK. Studies compared laughter therapy to a social group intervention,[1] control condition or usual care,[1-4] or exercise therapy.[4]

Main Findings

The RCT which compared laughter therapy to a social intervention and a control group in a general adult population, some of whom had symptoms of mild anxiety and/or depression, found some evidence of improvements in measures of emotional well being, associated with laughter therapy.[1] However, there were no statistically significant differences in measures of stress, anxiety, or depression, between the three groups.[1] The controlled trial conducted in community-dwelling elderly people in Korea, some of whom had symptoms of mild depression, reported significant improvements in depression scores and sleep disturbance associated with laughter therapy.[2] There were no significant differences between the intervention and control groups on measures of function and health-related quality of life.[2] The cluster randomised trial, conducted in elderly Australian nursing home residents with dementia, reported that laughter therapy was associated with improvements in anxiety, but not depression, when compared to usual care.[3] Cohen-Mansfield Agitation Inventory (CMAI) scores in the intervention group decreased by 0.17 (95% CI: 0.004 to 0.34) points more than the control group, between baseline and follow-up, p=0.045.[3] Finally, the only study which was conducted solely in patients with depression found that laughter therapy and

exercise therapy both produced significant improvements in depression (measured by GDS-30) when compared to a control condition, and that there were no significant differences between the two active intervention groups.[4]

Authors Conclusions
One study cautiously concluded that laughter therapy can be used to promote a sense of humour and potentially improve emotional well-being. One study concluded that laughter therapy has positive effects on depression, insomnia, and sleep quality in the elderly; by contrast, a second study in the elderly concluded that humour therapy did not significantly reduce depression but significantly reduced agitation. A fourth study concluded that laughter yoga was as effective as exercise therapy for improving depression and life satisfaction of elderly depressed women.

Reliability of conclusions/Strength of evidence
All four of the studies included in this evidence summary were methodologically weak (all were rated as 'high risk of bias' on at least two of the six domains assessed) and reporting of study methods was generally poor. Findings were inconsistent across studies, with respect to the effectiveness of laughter therapy interventions compared to a control condition and reliable conclusions cannot, therefore, be drawn. All of the identified studies are likely to have limited generalisability to the management of anxiety and depression in a general adult population in the UK.

What do guidelines say?

Neither NICE nor SIGN guidelines discuss the use of laughter therapy as interventions for anxiety or depression.

The information included in this evidence summary is insufficient to inform the development of clinical guidance on laughter therapy interventions for depression and anxiety.

Date question received:
Date searches conducted:
Date answer completed: 03/02/2014

References

RCTs

1. Crawford, S.A. and Caltabiano, N.J. (2011) Promoting emotional well-being through the use of humour, *The Journal of Positive Psychology: Dedicated to furthering research and promoting good practice 6* **(3)** pp. 237-252.

2. Ko, H-J. and Youn, C-H. (2011) Effects of laughter therapy on depression, cognition and sleep among the community-dwelling elderly. *Geriatrics Gerontology International 11* **(3)** pp.267-274.

3. Low, L-F., Brodaty, H., Goodenough, B., Spitzer, P., Bell, J-P., Fleming, R., Casey, A-N., Liu, Z. and Chenoweth, L. (2013) The Sydney Multisite Intervention of LaughterBosses and

ElderClowns (SMILE) study: cluster randomised trial of humour therapy in nursing homes. *BMJ Open 3* **(1).**

4. Shahidi, M., Mojtahed, A., Modabbernia, A., Mojtahed, M., Shafiabady, A., Delavar, A. and Honari, H. (2011) Laughter Yoga *versus* group exercise program in elderly depressed women: a randomized controlled trial. *International Journal of Geriatric Psychiatry 26* pp. 322-327.

Results

RCTs

Author (year)	Inclusion criteria	Number of participants	Summary of results	Risk of bias
Crawford and Caltabiano (2011)	*Participants:* Community participants recruited through television and radio interviews, advertisements in university and local newspapers, email, internet and fliers. **There were no inclusion criteria relating to a diagnosis of anxiety or depression** and no other inclusion criteria were specified. Participants who were on antidepressants, in addition to seeking help from a Psychologist, were excluded. Participants were incentivised to complete the study by entry into a $100 prize draw on completion. *Intervention:* Humour skills programme; humour skills training session over 8 weeks which positively orientated the concept of using humour to cope with stress and adversity and included the provision of a manual which included, jokes, quotes and humorous stories. *Comparator:* Social group (did not receive humour skills	n = 55 (n=20 control group, n =14 social group, n=21 humour group).	This study aimed to investigate whether a sense of humour is a set of skills that can be developed, whether these skills are associated with increased levels of emotional well-being and whether any intervention effects are maintained during follow-up. 33% of the study sample were university students and 67% were female. The mean age of participants was 38 years (range 18 to 68). Fourteen participants were deemed to be in the clinical range for depression, 9 in the anxiety range and 21 had elevated levels of stress. However, it was not clear how many participants had clinical symptoms overall (i.e. were anxiety, depression and stress symptoms present in the same participants); judgements about symptoms appear to have been reached using DASS. At baseline, 8 participants from the humour group, 5 from the social group and 1 from the control group met the criterion for depression; 5 participants from the humour group and 2 each from the social and control groups were in the clinical range for anxiety. Self efficacy: Participants in the humour group had improved self efficacy compared to the social and control groups; Maine effect fro	Participants were assigned to groups by writing names on paper slips, mixing the slips with eyes closed and drawing first 21 names fro the humour group, then 20 for the social group; the remaining 14 names comprised the control group. The nature of the intervention precluded blinding of

	training however met for morning tea over the same 8 week period) or Control (no intervention). *Outcomes:* Well-being measures (individual perceptions of stress, control, optimism, self-efficacy and positive and negative effect) operationalised by: Generalised Self-Efficacy (GSE) scale; Positive and Negative Affectivity Schedule (PANAS), The Life Orientation Test (LOT-R), Perceived Control of Internal States Scale (PCOISS), Perceived Stress Scale (PSS) and DASS.		group $F(4,102) = 5.30$, $p = 0.001$. There was a significant time-group interaction. PANAS: There was a significant main effect for group $F(4,102) = 3.59$, $p < 0.01$ and no significant interaction between intervention and time. Optimism: There were no significant differences between the social and control groups, post-intervention or at follow-up. There was no significant difference between the humour and control groups, post-intervention. There was a significant difference between the humour and social groups, post-intervention, (un-specified medium effect size, $p = 0.006$) and at follow-up (large effect size r = 0.60, $p< 0.001$). There was also a significant difference between the humour and control groups, at follow-up (medium effect size r = 0.43, $p= 0.005$). PCOISS: Over the three time periods, there was a significant difference between the humour and control groups (large effect size r =0.56, $p < 0.001$) and between the humour and social groups (large effect size r =0.576, $p < 0.001$). Perceived stress (PSS): There were no significant differences between the groups for any of the time periods.	participants and personnel. It was not clear whether outcomes were assessed blind to study group allocation. All participants completed the study. Results were reported for all specified outcomes, but actual values for outcome measures were not reported and sample size may not have been adequate to support the complexity of

			Depression (DASS): At 3 month follow-up 7 of the 8 participants in the humour group, who were classified as clinically depressed at baseline, had moved to a none clinical group. The number of clinically depressed participants in the control group remained constant (n=1) throughout. The number of clinically depressed participants in the social group increased from 5 at baseline to 9 post-intervention and 10 at follow-up. There were no significant differences between the groups for any of the time periods. Anxiety (DASS): Post-intervention, all or the 5 participants in the humour group who were in the clinical range for anxiety at baseline fell within the normal functioning range. The number of clinically anxious participants in the social group remained constant (n = 2) throughout. The number of clinically anxious participants in the control group increased from 2 at baseline to 4 post-intervention and at follow-up. There were no significant differences between the groups for any of the time periods. Stress (DASS): The number of participants in the humour group who were in the clinical range for stress fell from 8 at baseline to 2 post-intervention and zero at follow-up. The number of participants in the social group who were in the clinical range for stress fell from 3 at baseline to 2 post-intervention and at follow-up, and the number of clinically stressed participants	the analyses presented.

			in the control group increased from 2 at baseline to 4 post-intervention and at follow-up. There were no significant differences between the groups for any of the time periods.	
Ko et al. (2011)	*Participants:* Elderly patients presenting to a community centre in Korea for a free health consultation. Inclusion criteria were: aged 65 or older; not admitted to hospital within 1 month; not involved in other research studies. **There were no inclusion criteria relating to a diagnosis of anxiety or depression.** *Intervention:* Laughter therapy; delivered by a certified laughter therapist. Consisted of 1 hour laughter therapy once a week for 4 weeks. Sessions included laughter meditation, laughing aloud, dancing, singing and how to think positively. *Comparator:* Control (no intervention) *Outcomes:* Depression (GDS-15), mental state (MMSE-K), functional abilities (K-IADL), health related quality of life (HRQOL, SF-36) and perceived sleep difficulties (ISI and PSQI). Outcomes were assessed based on follow-up questionnaires completed, with the	n = 200 (n= 100 laughter therapy, n=1001 control group). n = 109 participants were included in the analysis (n= 48 laughter therapy, n=61 control group).	This study aimed To investigate the effects of laughter therapy on depression, cognitive function, quality of life, and sleep in an elderly community-dwelling population. There were no significant baseline differences in demographic characteristics (age, gender distribution, education level, economic status, physical diseases), or measures of depression and quality of life (GDS, MMSE, ADL, IADL and SF-36) between the intervention and control groups. The mean age of study participants was approximately 75 years and the majority (61%) had no formal education. The mean GDS-15 score was approximately 8 (in the mild depression range). Depression (GDS-15): There was a significantly greater decrease in GDS score in the intervention group (baseline 7.98 ± 3.58 to follow-up 6.94 ± 3.19) than in the control group (baseline 8.08 ± 3.96 to follow-up 8.43 ± 3.44), p = 0.011. MMSE: There were no significant changes in MMSE and no significant difference between the groups.	The article states that participants were randomly assigned to groups, but no details of the randomisation procedure or allocation concealment are reported. The nature of the intervention precluded blinding of participants and personnel. It was not clear whether outcomes were assessed

	help of research assistants, one month after completion of therapy.		HRQoL: There was no significant difference in change in overall HRQoL score, from baseline to follow-up, between the intervention and control groups. There was a significantly greater decrease in the body pain (BP) domain in the control group (57.20 ± 26.53 to 49.66 ± 23.31) compared to the intervention group (54.04 ± 25.99 to 56.06 ± 17.86), p = 0.028, but no significant between group differences for the remaining 7 domains. Sleep disturbance: The intervention group showed no significant change in ISI score, from baseline to follow-up (8.00 ± 6.29 to 7.58 ± 5.38, p = 0.327), where as ISI scores were increased in the control group (8.36 ± 6.38 to 9.31 ±6.35, p = 0.019), p = 0.015. PSQI scores decreased in the intervention group (6.98 ± 3.41 to 6.04 ± 2.35, p = 0.019) and were unchanged in the control group (7.38 ± 3.70 to 7.30 ± 3.74, p = 0.847), p = 0.047.	blind to study group allocation. However, outcomes were assessed based on follow-up questionnaires completed with the help of research assistants. 17 Participants from the intervention group and 9 from the control group were excluded because they did not 'fulfil the initial questionnaire sincerely'. 35 Further participants from the

				intervention group, who received laughter therapy < 3 times or who 'answered the questionnaire insincerely', were excluded, and 30 further participants from the control group, who were lost to follow-up or who 'answered the questionnaire insincerely', were excluded. No results were reported for ADL measures.
Low et al.	*Participants:*	n = 398	This study aimed to assess the effects of humour therapy on	Cluster

(2013)	Residents of 228 nursing homes in Sydney, Australia. Inclusion criteria: aged over 50 years; admitted to full time care more than 12 weeks before study; not exhibiting behaviour presenting a risk to study personnel; could communicate; able to consent; had no florid psychiatric symptoms. **There were no inclusion criteria relating to a diagnosis of anxiety or depression.** *Intervention:* Professional 'ElderClowns' (a trained performer experienced in healthcare settings) provided 9–12 weekly humour therapy sessions, augmented by resident engagement by trained staff who tailored their interactions to maximise resident engagement, laughter and enjoyment, adapting to the personality, mood and physical and cognitive abilities of the resident. *Comparator:* Usual care. *Outcomes:* Depression (Cornell Scale for Depression in Dementia), agitation (Cohen-Mansfeild Agitation Inventory), behavioural disturbance (Neuropsychiatric Inventory), social engagement (Multidimensional	(n=209 control, n=189 humour therapy)	depression, agitation, behavioural disturbances, social engagement and quality-of-life in nursing home residents. At baseline, there were no significant differences on demographic characteristics between the intervention and usual care groups. Intervention group participants were taking slightly more regular psychotropic medications and were rated by staff as having higher levels of agitation on the CMAI. The mean age of study participants was 84.5 years. The mean score on the Cornell Scale for Depression in Dementia was approximately 8.2 (consistent with mild depression). 310 (78%) of participants had a diagnosis of dementia. A total of 191 humour therapy sessions were delivered (mean = 11 ± 1 per facility), with individual participants receiving a mean of 9 ±3 ElderClown visits. Group by time interactions were non-significant for depression, non- agitation behavioural disturbance, social engagement and participant-rated or proxy-rated quality-of-life. The group by time interaction was significant for agitation measured by Cohen-Mansfield Agitation Inventory (CMAI). The intervention group decreased by 0.17 (95% CI: 0.004 to 0.34) points more than the control group, between baseline and follow-up, p=0.045. The difference in scores was 2.52 (95% CI: 0.20 to 5.32), p=0.07.	randomised trial. Homes were assigned a study number by the administrative assistant and deidentified characteristics were used for randomisation. A random number generator in Excel was used to assign homes to intervention and control groups. One investigator and the administrative assistant were aware of treatment allocation

	Observation Scale for Elderly Subjects) and self and proxy rated health related quality of life (DEMQOL). Data were collected at baseline (week 0), post-intervention (week 13) and at follow-up (week 26).			before baseline assessment at each facility. Single-blind study. Intention-to-treat analyses. Results were reported for all specified outcome measures.
Shahidi et al. (2011)	*Participants:* Depressed women (Geriatric Depression Scale (GDS-30) score of higher than 10 indicating at least moderate depression), aged between 60 and 80 years, were recruited from a cultural community centre for women in Tehran, Iran. *Intervention:* Laughter yoga; 10 sessions, facilitated by a trained researcher. Sessions consisted of talk about something delightful, hand clapping, chanting, harmonic movements, laughter exercises and childlike	n = 60 (n = 23 laughter yoga, n = 23 exercise therapy, n=24 control groups).	This study aimed to compare the effectiveness of Kataria's Laughter Yoga and group exercise therapy in decreasing depression and increasing life satisfaction in older adult women of a cultural community of Tehran, Iran. The mean age of study participants was 67 years. Baseline demographic characteristics (age, marital status, education, occupation, number of children, and living status (alone or with spouse or children)) were similar across the three groups. Depression (GDS-30): Participants in the laughter therapy and exercise therapy	The article reports randomised allocation, but no further details are provided. The nature of the intervention precluded blinding of

	playfulness. *Comparator:* Exercise therapy; ten sessions of aerobic group exercise program including jogging and stretching or control group (not specified). *Outcomes:* Depression (Yesavage Geriatric depression scale, GDS-30), life pleasure (Diener life satisfaction scale, LSS).		groups both showed significant improvements in GDS score, baseline to post-treatment, when compared to the control group (laughter therapy 16.0 ± 5.3 to 10.0 ± 6.9 vs. control 15.2 ± 3.9 to 15.2 ± 6.1, $p < 0.001$, and exercise therapy 15.3 ± 5.4 to 11.1 ± 6.2 vs. control 15.2 ± 3.9 to 15.2 ± 6.1, $p < 0.01$); there were no significant differences between the two groups, $p = 0.4$. Life satisfaction (LSS): The laughter therapy group showed a significant improvement in LSS score (19.2 ± 4.1 to 25.9 ± 5.6) compared to the control group (20.2 ± 6.2 to 20.0 ± 5.1), $p < 0.001$. There was no significant difference between the exercise therapy and control groups, $p = 0.1$.	participants and personnel. It was not clear whether outcomes were assessed blind to study group allocation. Results appeared to be based on data for 20 participants from each group. Results were reported for both specified outcome measures.

Risk of Bias:

RCTs

Study	RISK OF BIAS					
	Random allocation	Allocation concealment	Blinding of participants and personnel	Blinding of outcome assessment	Incomplete outcome data	Selective Reporting
Crawford and Caltabiano (2011)	☹	☹	☹	?	☺	☹
Ko et al. (2011)	?	?	☹	☹	☹	☹
Low et al. (2013)	☺	☹	☹	☺	☺	☺
Shahidi et al. (2011)	?	?	☹	?	☹	☺

☺ Low Risk ☹ High Risk ? Unclear Risk

Search Details

Source	Search Strategy	Number of hits	Relevant evidence identified
SRs and Guidelines			
NICE	laugh* AND (therap* OR yoga)	29	
DARE	(laugh*) IN DARE 4 Delete 2 (hasya* adj2 yoga*) IN DARE 0 Delete 3 MeSH DESCRIPTOR Laughter Therapy EXPLODE ALL TREES 0 Delete 4 MeSH DESCRIPTOR Laughter EXPLODE ALL TREES 0 Delete 5 #1 OR #2 OR #3 OR #4	4	0
Primary studies			
CENTRAL	#1 MeSH descriptor: [Laughter Therapy] this term only 16 #2 Enter terms for search "laughter therapy""laughter therapy" 18 #3 Enter terms for search "humour therapy""humour therapy" 1 #4 Enter terms for search "humor therapy""humor therapy" 5 #5 Enter terms for search #1 or #2 or #3 or #4#1 or #2 or #3 or #4 22 #6 MeSH descriptor: [Mental Disorders] explode all trees 40682 #7Enter terms for searcdepression30326 #8Enter terms for searcanxiety19765 #9Enter terms for searc#6 or #7 or #870364 #10Enter terms for searc#5 and #9 10 Central only 9	9	
PsycINFO	1. PsycINFO; "laughter therapy".ti,ab; 6 results.	76	

	2. PsycINFO; LAUGHTER/ OR HUMOR [+NT]/; 4109 results. 3. PsycINFO; 1 OR 2; 4110 results. 4. PsycINFO; exp MENTAL DISORDERS/; 426161 results. 5. PsycINFO; (depression OR anxiety).ti,ab; 249816 results. 6. PsycINFO; 4 OR 5; 550199 results. 7. PsycINFO; 3 AND 6; 444 results. 8. PsycINFO; CLINICAL TRIALS/; 7193 results. 9. PsycINFO; random*.ti,ab; 125038 results. 10. PsycINFO; groups.ti,ab; 357363 results. 11. PsycINFO; (double adj3 blind).ti,ab; 17482 results. 12. PsycINFO; (single adj3 blind).ti,ab; 1352 results. 13. PsycINFO; EXPERIMENTAL DESIGN/; 8891 results. 14. PsycINFO; controlled.ti,ab; 77926 results. 15. PsycINFO; (clinical adj3 study).ti,ab; 7677 results. 16. PsycINFO; trial.ti,ab; 65862 results. 17. PsycINFO; "treatment outcome clinical trial".md; 25521 results. 18. PsycINFO; 8 OR 9 OR 10 OR 11 OR 12 OR 13 OR 14 OR 15 OR 16 OR 17; 552089 results. 19. PsycINFO; 7 AND 18; 74 results. 20. PsycINFO; ("humour therapy" OR "humor therapy").ti,ab; 14 results. 21. PsycINFO; 3 OR 20; 4114 results. 22. PsycINFO; 6 AND 21; 446 results. 23. PsycINFO; 18 AND 22; 76 results.		
Embase	23. EMBASE; "laughter therapy".ti,ab; 26 results. 24. EMBASE; LAUGHTER/ OR HUMOR [+NT]/; 11105 results. 25. EMBASE; 23 OR 24; 11119 results. 26. EMBASE; exp MENTAL DISORDERS/; 1493135 results. 27. EMBASE; (depression OR anxiety).ti,ab; 354818 results.	187	

	28. EMBASE; 26 OR 27; 1620689 results. 29. EMBASE; 25 AND 28; 3133 results. 30. EMBASE; 29 AND 18; 0 results. 31. EMBASE; ("humour therapy" OR "humor therapy").ti,ab; 30 results. 32. EMBASE; 25 OR 31; 11129 results. 33. EMBASE; 28 AND 32; 3138 results. 34. EMBASE; random*.ti,ab; 869651 results. 35. EMBASE; factorial*.ti,ab; 22435 results. 36. EMBASE; (crossover* OR cross-over*).ti,ab; 69159 results. 37. EMBASE; placebo*.ti,ab; 199410 results. 38. EMBASE; (doubl* ADJ blind*).ti,ab; 142963 results. 39. EMBASE; (singl* ADJ blind*).ti,ab; 14261 results. 40. EMBASE; assign*.ti,ab; 236791 results. 41. EMBASE; allocat*.ti,ab; 81853 results. 42. EMBASE; volunteer*.ti,ab; 176368 results. 43. EMBASE; CROSSOVER PROCEDURE/; 39341 results. 44. EMBASE; DOUBLE BLIND PROCEDURE/; 119415 results. 45. EMBASE; RANDOMIZED CONTROLLED TRIAL/; 362850 results. 46. EMBASE; SINGLE BLIND PROCEDURE/; 18704 results. 47. EMBASE; 34 OR 35 OR 36 OR 37 OR 38 OR 39 OR 40 OR 41 OR 42 OR 43 OR 44 OR 45 OR 46; 1402658 results. 48. EMBASE; 33 AND 47; 187 results.		
Medline	24. MEDLINE; "laughter therapy".ti,ab; 21 results. 25. MEDLINE; LAUGHTER/ OR HUMOR [+NT]/; 1209 results. 26. MEDLINE; 24 OR 25; 1225 results. 27. MEDLINE; exp MENTAL DISORDERS/; 970843 results. 28. MEDLINE; (depression OR anxiety).ti,ab; 292846 results. 29. MEDLINE; 27 OR 28; 1143102 results. 30. MEDLINE; 26 AND 29; 271 results.	65	

	32. MEDLINE; ("humour therapy" OR "humor therapy").ti,ab; 22 results. 33. MEDLINE; 26 OR 32; 1242 results. 34. MEDLINE; 29 AND 33; 279 results. 35. MEDLINE; "randomized controlled trial".pt; 395884 results. 36. MEDLINE; "controlled clinical trial".pt; 90603 results. 37. MEDLINE; randomized.ab; 311360 results. 38. MEDLINE; placebo.ab; 166092 results. 39. MEDLINE; "drug therapy".fs; 1786844 results. 40. MEDLINE; randomly.ab; 220035 results. 41. MEDLINE; trial.ab; 328153 results. 42. MEDLINE; groups.ab; 1394874 results. 43. MEDLINE; 35 OR 36 OR 37 OR 38 OR 39 OR 40 OR 41 OR 42; 3474597 results. 44. MEDLINE; 34 AND 43; 65 results.		
Summary	**NA**	**NA**	

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