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Laughter and humour interventions for well-being in older adults: A systematic review and intervention classification

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ABSTRACT

Objectives: To assess the potential of laughter and humour interventions to increase well-being in a general population of adults aged 60 plus; and to develop a classification to compare approaches and potential benefits of different intervention types.

Design: A systematic search of Web of Science, PubMed/MEDLINE, PsychInfo, AMED, and PsychArticles used inclusive terms relating to laughter and humour interventions. A realist synthesis approach enabled heterogeneous interventions to be compared pragmatically.

Setting: Five laughter interventions, and one humour intervention, using one or more outcome related to well-being, were considered for inclusion after screening 178 primary research papers. The five laughter interventions, representing a sample of 369 participants, were retained.

Main outcome measures: Well-being related outcome measures reported in each intervention informed efficacy; Joanna Briggs Institute tools appraised design; and a realist approach enabled heterogeneous interventions to be measured on their overall potential to provide an evidence base.

Results: Well-being related measures demonstrated at least one significant positive effect in all interventions. Confounding factors inherent in the intervention types were observed. Individual participant laughter was not reported.

Conclusions: Laughter and humour interventions appear to enhance well-being. There is insufficient evidence for the potential of laughter itself to increase well-being as interventions contained a range of confounding factors and did not measure participant laughter. Interventions that isolate, track, and measure the parameters of individual laughter are recommended to build evidence for these potentially attractive and low-risk interventions. The classification proposed may guide the development of both evidence-oriented and population-appropriate intervention designs.

1. Introduction

The high prevalence of chronic disease, multi-morbidity, and psychosocial issues in older people necessitates action, including prioritising well-being according to the World Health Organisation (WHO)[1]. Well-being, defined by the WHO (Five) Well-being Index[2] to include feeling cheerful, active, relaxed, rested, and interested in life, is thought to buffer physical and mental disease[3], and benefit health maintenance in older adults[4]. Laughter is a universal sign of joy[5]. It is contagious and likely evolved prior to language to communicate and elicit mirth[6]. As the psychological and physiological effects of laughter can increase mood, optimism, energy, and cognitive function, and decrease anxiety, stress, loneliness, depression, and tension[7,8] laughter interventions are of interest.

A systematic review of interventions that elicit laughter in older adults would enable more insight into the effectiveness of using laughter to increase well-being. This review was conducted as none was found, notwithstanding Dr. Mora-Ripoll's[7] encouraging narrative review of the potential of simulated (self-induced) laughter in a range of populations. The International Prospective Register of Systematic Reviews listed three ongoing relevant reviews: 1) humour and laughter therapy for people with dementia[9]; 2) the use of humour in palliative care[10]; 3) the effects of laughter yoga on mental health[11].

Therapeutic laughter has a long history[12], however the scientific study of laughter (gelotology; *gelos* is Greek for laughter) dates to 1964 when Dr. William Fry, a humour researcher[13], founded the Institute of Gelotology at Stanford University[14]. Fry highlighted the value of humour and laughter in the aging process[15], and demonstrated the benefits of laughter on blood pressure and the cardiovascular system[16]. As evidence of the ability of laughter to reduce stress and pain, relax

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muscles, and benefit the cognitive and immune systems emerged[8,17] laughter therapies were legitimized and developed. Most were based on humour and comedy, for example Patch Adams' clown therapy[18].

Laughter interventions dispensing with humour (humour though universal[19] is individual[20] and hard to sustain) were popularized by Dr. Madan Kataria in India. Kataria added joke telling to his yoga classes in 1995 to harness the health benefits of laughter. When the jokes ran out he advised participants to 'laugh for no reason'[21]. The idea of 'faking' laughter as therapy was not new[22], but the scale was. According to Kataria thousands of laughter yoga clubs exist[23] combining breathing techniques with clapping and playful exercises[21]. Laughing qigong, promoted for health in Taiwan since 1998, uses principles of Chinese medicine and emphasizes breathing and core strength[24].

Laughter is freely available, and has few contraindications[7], making interventions that elicit laughter attractive for aging populations. European demographics are predicted to catch up with Japan, where over 30% of people are aged 60 plus, by 2050[1]. This research aimed to: 1) ascertain whether laughter and humour interventions are effective in increasing well-being in a general population of older adults; 2) create a practical classification of interventions (none was found) to compare approaches and potential benefits among intervention types, and guide future intervention designs.

2. Methods

Search, appraisal, and synthesis methods were chosen for explicitness, reproducibility and to enable pragmatic comparisons[25,26]. A Web of Science search was undertaken in September 2017 to capture an extensive range of publications in English, since 1970, linking laughter to health. This search was both general, to anchor the review within the overall literature, and targeted. Targeted searching was also undertaken in PubMed/MEDLINE, PsychINFO, AMED and PsychARTICLES between September and November 2017. A PICOS framework[26] supported targeted searching: Population (adults 60 years plus), Intervention (actively involving laughter), Comparison (control trial), Outcome (well-being), Study design (all). Results were exported into Covidence[27] to facilitate data management.

Duplicate papers were eliminated to identify 796 individual papers. The preferred reporting items for systematic reviews and meta-analyses (PRISMA)[28] flow chart (Fig. 1) documents the screening process and exclusion criteria. Papers with content relating indirectly to laughter and health, and to pathological, drug-induced, and stimulated (e.g., by tickling) laughter, were excluded. The remaining 442 papers were screened to exclude non-primary research papers and interventions that did not aim to elicit participant laughter; 178 papers were eligible, almost a third relating to adults aged 60 plus.

Six papers focusing on a general population (i.e., not intentionally on specific health issues), with outcome benefits relating to increasing well-being, and mentioning participant laughter, were initially retained: one randomised control trial (RCT), one randomised trial, and four using a quasi-experimental design (QED).

Data extraction was undertaken to compare the papers (Table 1 summarises the five papers retained). A classification of interventions was created to analyse intervention approaches (Fig. 2). Intervention appraisal tools from the Joanna Briggs Institute[29,30] facilitated comparisons between design types and were used to evaluate methodological quality, including data validity and potential biases. One paper, the only defined as a humour intervention[31] and including a laughter 'prescription', was eliminated as it met less than half of the QED appraisal criteria[30]. Analysis of the five papers was conducted using a realist synthesis approach[25] due to intervention heterogeneity.

3. Results

3.1. Overview of interventions

Selected results, and variations in intervention design and type, are illustrated in Table 1. All interventions demonstrated statistically significant and beneficial changes in at least one outcome measure relating to well-being. Intervention types differed, and were analysed using the classification.

3.2. Classification of interventions

The quadrant diagram classification of laughter and humour interventions (Fig. 2) facilitated comparisons. Classification differentiates intervention type and approach in 1) how laughter is induced (humour-induced versus self-induced); and 2) the participant activity content (laughter as the main activity versus laughter as one of multiple activities). Each quadrant represents a different approach. Quadrants to the left (1 and 3) use humour to elicit laughter; those to the right (2 and 4) use self-induced laughter. The top quadrants (1 and 2) use laughter as the main participant activity; the bottom quadrants (3 and 4) are 'busy' as laughter is one of multiple participant activities.

The interventions reviewed were all defined as laughter interventions: laughter yoga (Paper 1[32]), a laughter and exercise program (Paper 2[33]), laughter qigong (Paper 3[34]), and laughter therapy (Paper 4[35], and Paper 5[36]). Four interventions, classified in quadrant 4, used self-induced laughter, and were 'busy' (Paper 1[32], Paper 3[34], Paper 4[35], and Paper 5[36]). Paper 2[33] comprised two elements, one using humour-induced laughter with laughter as the main activity, classified in quadrant 1, and the second a separate exercise program; overall its approach was 'busy'.

Interventions can be hybrid, and include external non-laughter elements, as with Paper 2[33], or include, or exclude, elements from the different quadrants. Paper 1[32] did not include laughter meditation, recommended in laughter yoga interventions[21]. Paper 4[35] included laughter meditation, but that element could not be classified as the approach was not reported: laughter meditation can include stretching[37] (quadrant 4), or, just laughing as recommended in laughter yoga (quadrant 2). The humour intervention that was screened and rejected[31] included a laughter 'prescription' that also could not be classified as the approach was not reported.

3.3. Result details

The majority of sample sizes were small. The 369 participants, recruited using convenience or purposive sampling, were split between experimental (212), and control (157) groups. Paper 1[32] and Paper 2[33] had no control. High attrition occurred in Paper 4[35], with 91 of 200 participant results omitted due to 'insincere' responses. This impacted the final sample size, which was reduced to 273; 158 in the experimental, and 115 in the control groups.

The sample was split almost equally between community dwellers and those in residential care. Various sample biases were observed. Paper 1[32] included only women, half of whom had a dementia diagnosis, despite the paper not focusing on dementia. Paper 4[35] reported low socio-economic status and no formal education in the majority of participants. Paper 2[33] excluded participants with disabilities, and Paper 3[34] participants with disease-induced physical discomfort.

All five interventions appeared to use consistent and reliable outcome measures, and appropriate statistical analysis for evaluation. Measurements were taken once pre-test and post-test in all interventions, with the exception of Paper 1[32] which also measured at three points during the interventions. Paper 2[33] took a second post-test measurement. Paper 1[32] and Paper 2[33] had no control, although Paper 2[33] used a second delayed treatment group in a partial crossover design. None of the interventions recorded whether individual participants