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Effectiveness of Exercise on Quality of Life Among Adult Population

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ABSTRACT

Obesity is a worldwide health problem, from half-century and ranking as the secondary cause of death after smoking. Obesity is a cause of many chronic diseases like diabetes mellitus, hypertension and has a detrimental change in quality of life (QoL) This systematic review explores effectiveness of exercise interventions on QoL in adults. A database systematic search yielded 113studies from different database, which were reduced to 10 randomized control trials consisting of 807 participants. There were 283 people allocated in Control group and 524 in the exercise groups: 208 in the Aerobics group, 82 in Zumba and Dance Interventions, and 184 in Strength Training. The SF-36 was most commonly used to identify health-related quality of life (HRQoL). The studies assessed the effects of various interventions, including different dance exercise like Zumba dance, aerobic exercise, strength training and HIIT for 12-16 weeks. The Findings of the study shows that the aerobic and dance-based exercise as an intervention is effective in multiple aspects of QoL, such as physical and psychological well-being. The that aerobic exercise was remarkably effective in improving physical health, psychological well-being, social relations, and environmental aspects ($p<0.001$). HIIT groups reveals the similar improvements in the PCS score and the MCS score ($p <0.05$) Dance interventions were effective in social and mental functioning ($p<0.001$). The control group experienced no notable improvements; The review reveals that the exercise and dance have a potential to enhance the quality of life.

Keywords: effectiveness, quality of life, exercise, obesity

INTRODUCTION

Worldwide the obesity is extensive and has spreading worsen from past five decades and it is the secondary cause of death after smoking. (1). (2). Obesity is leading cause that may increases the threat of non - communicable disease and effect on the individuals quality of life such as sleeping

or moving (3). There is a relationship between obesity and several chronic and noncommunicable diseases such as asthma, cerebrovascular attack or stroke, cholecystitis cholelithiasis, chronic low back pain, coronary heart disease diabetes Type II, heart disease, hypertension, non-alcoholic fatty liver , sleep related breathing disorder such as obstructive sleep apnea, osteophytes, pulmonary embolism. (4).

Most of the obesity people were seeking the weight reduction modality to ensure the good quality of life. QoL is the subjective concept that human grasp the welfare of both the effective and non-effective component within the totality of their existence at a given point. The usual elements of quality of life include physical, mental, and spiritual and it is affected by the relationship status, qualification, job status, social status, wealth, safety and security, liberty in decision-making, social-belonging and their physiological environment. (Teoli and Bhardwaj, 2024) WHO defines that the quality of life is a subjective evaluation of ones, which is set in a cultural, social and environmental circumstances. (5) The quality-of-life index of Luxembourg is high 219.3 and low in Nigeria 42.7 among 83 countries, India is in 53 ranks with quality-of-life index 123.8.(6). The quality of life is determined by different aspect such as physical aspect like body image, body function, mental and psychological aspect social and spiritual aspect. The quality of life is affected by disturbed in body image due to the obesity. The study done to assess the association of obesity and quality shows that increased obesity is directly associated with decreases in health-related quality of life (7). In America the quality of life of obesity is lower than normal weight population they seek the measures to reduce the weight (8). Similarly in south India higher score of BMI has lower score of physical psychological impact (9). The study of the Sweden reveals that the lower score of quality of life is associated with obesity and have impaired in physical health psychological wellbeing vitality and uses the prescribed drugs for hypertension diabetes mellitus etc. (10)

To prevent from the complication and to promote the quality of life one of the best ways is to modify the lifestyle like consume healthy diet, regular exercise, maintain sleep quality, and minimization of stress for the weight maintenance either decreasing food intake (dieting) or increasing physical activity like aerobic exercise restrain activity. (11). Aerobic exercise is the exercise that allow to breath and enter enough oxygen into the body helps the heart to enough pumping so it is also called cardiac exercise. With the presence of oxygen body creates the energy by using stored carbohydrate and fats so it results in possible weight loss, lower the blood glucose and lipid level. There are several types of aerobic exercise among them Zumba dance is also one of the types of aerobic exercise (12). Zumba ais the Latin dance and fitness training helps to enhancing balance, gait, fitness, cardio and coordination. It is the highly choreographed dance mix with aerobic exercise. The Zumba dance was started as fitness aerobics class from United States in 2001 by Alberto who was Colombian dancer. It is 45- 60 min dance starting with 10 min warm up 30 min fast intense dance and 5-10 min closing wrap dance which is highly choreographed by Zumba certified trainer with western music (13). This review aimed to gain the comprehensive understanding about the effect of exercise intervention on quality of life among adult.

MATERIALS & METHODS

Search strategy

The design of this study is a narrative review. A systematic electronic search used to identify the relevant studies. The primary research only included in this study. The electronic database searched are: PubMed, Scopus, EBSCO, EMBASE, Google Scholar, Clinical key and ResearchGate. All the previous literature were selected very systematically to be included in this review. The literature searched with Boolean by

using AND, OR, NOT. The key word used for the search strategy are obesity, effectiveness, adult, quality of life, dance, exercise, nursing intervention etc.

Inclusion criteria

- The articles that are directly belong to effectiveness of exercise on quality of life among obese adult.
- The research paper which was easily available in online and full text.
- A research paper which is completed in English language.
- A research article which is published 2019 onwards.
- Age group above 18 years are included
- The RCT with control group are included
- The outcome based on quality of life

Exclusion criteria

- An article which was published in journal which does not have ISSN number.
- An article which published in local language.
- An article that does not have statistical adequacy.
- An article that does not have adequate sample size

Selection of study

The study was selected as inclusion criteria. The researcher explores the titles and summaries followed by full text article with English language. The total 113 study identified from different electronic database searched are: PubMed, Scopus, EBSCO, EMBASE, Google Scholar, Clinical key and Research Gate, merged the 4 duplicate articles then screening done with full text and systemic review and pilot study, total 69 irrelevant study were excluded. 40 full text articles were screened with age, control group, intervention sample population as well as outcome of the study and study design. Finally, 10 study were selected for this narrative review (fig.1).

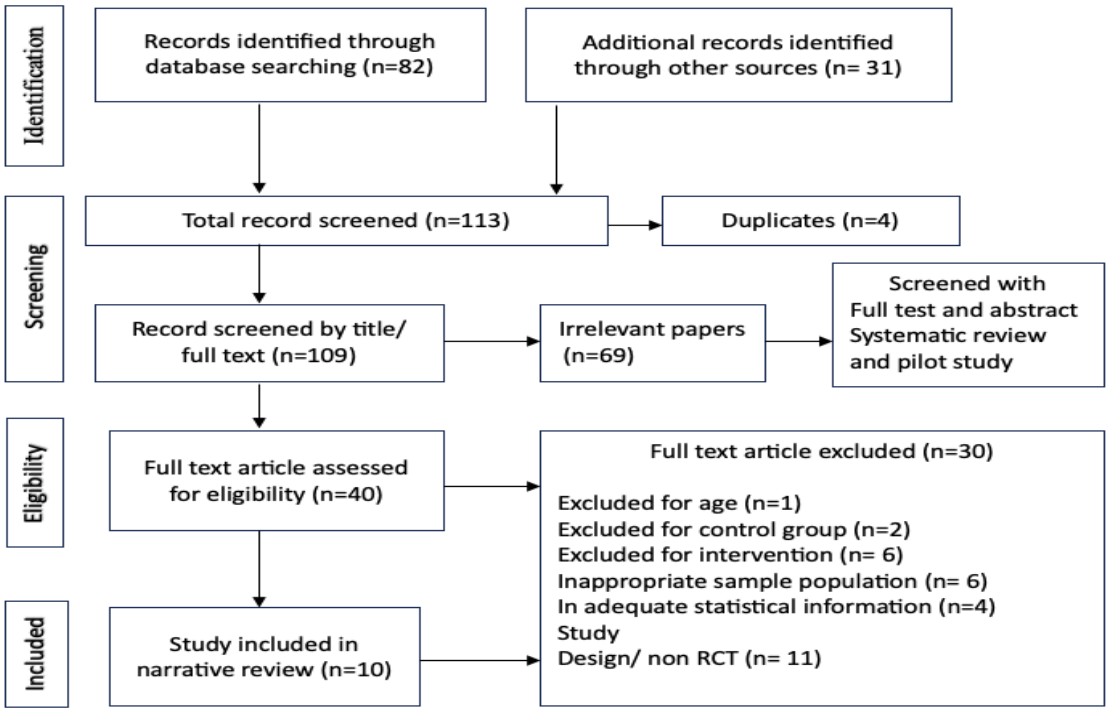

Fig 1. Flow chart of study selection process

RESULT

Table 1: Result of the research study selected for narrative review

Name of Author and date	Design of the study	Participant	Sample size	Tools used	Intervention	Outcome	Reference
Guner Cicek and Rabia Hurrem Ozdurak Singin (2023)	RCT	20- 45 years obese and overweight women	90 (CG=30, AE =30, RE=30).	WHOQOL-BREF	Daily exercise training for 10 weeks	Statistically significant among the groups in physical, psychological domain, social relationship and environment ($p<0.001$), between control and aerobic exercise and control and resistance exercise group ($p<0.001$) physical health, psychological health, social relationship and environment. There was not significant for physical health ($p=0.499$), psychological health ($p=0.931$), social relationship ($p=0.961$) and environment($p=0.999$) between aerobic and resistance group	(14)
Yaira Barranco-Ruiz, Susana Paz-Viteri and Emilio Villa-González +++(2020)	RCT	25- 50 years sedentary worker women	98 (CG= 33, DF= 33, DFFST= 32)	HRQoL (SF 36)	3 days per week for 16 weeks zumba fitness for dance group and whole-body functional body weight exercise	Statistical differences on Social Functioning and Mental Health dimensions ($p = 0.029$ and $p < 0.001$, respectively) among the CG and DF group.	(15)
Marcelina Sánchez-Alcalá, Agustín Aibar-Almazán, Fidel Hita-Contreras, Yolanda Castellote-Caballero, María del Carmen Carcelén-Fraile, Aday Infante-Guedes, Ana María González-Martín	RCT	Older adult above 65 years with mild cognitive impairment	92 (EG=47, CG=45)	HRQoL (SF36)	dance-based aerobic training 2 session per weeks for 12 weeks	significant result between pre and post treatment in experimental ($p = 0.000$) and between control and experimental groups in the post-intervention ($p= 0.000$).	(16)
Hossein Hosseinpour Setobadi, Akbar Nouri Habashi Khadiljeh Makhdoomi.	RCT	40-60 years hemodialysis patient	24 (exercise group= 12, control group= 12)	WHOQOOL BREEF	combined exercise for 8 weeks	Significantly upgrate in Quality of life in exercise group compare to control group in physical, psychological, environmental health ($p= P=0.001$) as well as social relationships ($P=0.010$).	(17)

Willen Remon Tozetto, Larissa dos Santos Leonel, Tiago Turnes, Giovani Firpo Del Duca	RCT	20 to 50 years obese men and women	69 (LG=23, CG=23, FG=23)	HRQoL SF36	16 weeks every day combined muscle strength and aerobic training	There is a significant increase in the SF score in physical functioning by 10.0 points with FG and LG, only 1.2-point increase in CG. In MCS and mental health, FG was significantly improved.	
Yetkin Utku KAMU, and Zafer DOĞRU		18 and 52 aged obese women	85 (ZG= 17, SAG= 18, SG=16, CG=18	WHOQOL-BREF	3 session per week Zumba steps aerobic, spinning for 12 weeks	Zumba dance is effective in psychological QOL of the subjects significantly ($p<.05$)	(18)
Ahmad Mahdi Ahmad, Asmaa Mohamed Mahmoud, Zahra Hassan Serry, Mohamed Mady Mohamed, Heba Ali Abd Elghaffar (2023)	RCT	36-55 years obese women with type 2 diabetes	72 (LVHIIT=24, HVHIIT=24, C=24)	SF-12 for HRQoL	3 session per week for 12-week HIIT training	Both HIIT groups shows the effective in the PCS score and the MCS score ($p > 0.05$)	(19)
Jiawei Zheng, Yang Cao	RCT	middle-aged and elderly women	109 (C=54, O=55)	36-Item Short Form Survey (SF-36), Pittsburgh sleep quality index (PSQI)	3 times a week plaza dancing for 24 weeks	Quality of life after the intervention plaza dance group had higher scores of qualities of life after intervention ($P < 0.05$).	(20)
Fatma Ben Waer, Mariam Lahiani, Cristina Ioana Alexe et.al	RCT	55–65 yrs. post-menopausal women	48 (ZG=16, PG=16, CG=16)	HRQoL (SF36) Brief Mood Introspection Scale (BMIS), Functional Performance Assessment	12-week Zumba and Pilates dance 3 session per week for 60 min each session	significantly improved in HRQoL SF 36 total scores (PG ($p<0.01$) ZG ($p < 0.001$), physical and social functions as well as mental health both (PG and ZG ($p < 0.001$), emotional problems ($p < 0.05$) only for the ZG.	(21)
Domingo Jesús Ramos-Campo, Miguel Ángel Rojo-Tirado, Pedro J. Benito-Peinado (2024)	RCT	18–50 years individuals with obesity	120 (E=30, S=30, SE=30)	HRQoL (SF36)	strength training, endurance training, combined strength plus endurance training for three times per week for 22 weeks	Significantly improvement in overall quality of life after strength training ($p = 0.030$), strength and endurance ($p =0.010$) but not after endurance ($p = 0.318$) and control $p = 0.516$).	(22)

***Note:** AE= Aerobic exercise, RE=resistance exercise, E= Endurance, S= strength training, SE= strength plus endurance, ZG= Zumba Group PG= Pilates Group, CG= Control Group, HVHIIT= High volume high intensity trade mail exercise LVHIIT= Low volume high intensity trade mail exercise, SG= spinning Group, SAG= Step Aerobics Group, LG= Linear Group, FG= Fixed Group, EG= Exercise Group, DG= Dance fitness Group, DFFT= Dance fitness with Zumba plus functional fitness training, HRQoL= Health Related Quality of Life, WHOQOL= World Health Organization Quality of Life.

Among ten randomized control trials analyzed, 807 adults aged 18 and over were included in this review. From the total sample, 436 participants were obese, 109 were elderly, and 24 were undergoing hemodialysis. More than 450 participants were aged 18 to 50 years and listed population 92 from above 65 years age. The participants were allocated by using the random technique to a study group and to a control group. There were 283 people allocated in Control group and 524 in the exercise groups: 208 in the Aerobics group, 82 in Zumba and Dance Interventions, and 184 in Strength Training. Most of the exercises had a duration of 12 to 16 weeks with three training sessions a week. Three study given the dance training including Zumba, Pilates and steps dance for 3 session a week and strength training and high intensity trade mail exercise are also given 3 session per week as a intervention. There are three study from this review were given daily exercise training as a intervention. The SF-36 was most frequently used to measure health-related quality of life (HRQoL) and later, the WHOQOL-BREF. The results showed that aerobic exercise was remarkably effective in improving physical health, psychological well-being, social relations, and environmental aspects ($p<0.001$). HIIT groups reveals the similar improvements in the PCS score and the MCS score ($p <0.05$) Dance interventions were effective in social and mental functioning ($p<0.001$), while HIIT effectively raised both physical and mental health scores and resistance training was significantly effective in physical as well as psychological health, social relationship and environment health ($p=0.001$). There are no remarkable changes in control group. In sum, these different interventions such as exercise and dance significantly improved the quality of life of all group of population.

DISCUSSION

These narrative reviews the effectiveness of exercise on quality of life among adult, is based on study design with Randomized control trial among 807 participants. In this study maximum of the population 450 were age group 18- 50 years. In this study the aerobic training is effective in improving physical health, psychological well-being, social relations, and environmental aspects ($p<0.001$). this finding was supported by the study done by Krishna B. Alphonsus shows that the aerobic exercise physical health, psychological well-being, social relations, and environmental aspects ($p<0.001$).(23) in this study Dance interventions were effective in social and mental functioning ($p<0.001$) this study was supported by the study done by Jingting Lu reveals that effective result for quality of life and satisfaction on life after the dance as an intervention. (24). In this study the HIIT is significantly effective in physical and mental score($p < 0.05$) similarly the study done by M Griffiths shows that physical domain ($p= 0.007$), mental ($p=0.031$) and overall QoL ($p=0.002$)(25)

CONCLUSION

Quality of life is the subjective thinking of the person that clasp the welfare of both the positive and negative component. The quality of the life is affected by different situation in life one of them is the body composition as the obesity. The study aimed to identify the effectiveness of various type of exercise on quality of life among the individual included 10 relative

study. This is colluded that the 12- 16 weeks exercise intervention like dance aerobic strength and high intensity exercise training was effective to improve the quality of life in different aspect among them aerobic exercise is effective in different component of quality of life.

It is suggested that the study can be done in similar type of exercise intervention like only Zumba dance or aerobic. The study can be done in homogenous study subject according to age, sex, disease condition. Similarly, study can be done in large amount of study. Study can be done as a systematic review rather than narrative review with meta-analysis.

Declaration by Authors

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