Available online at **www.ijmrhs.com**

ISSN No: 2319-5886

International Journal of Medical Research & Health Sciences, 2021, 10(8): 69-77

Healthy Lifestyle Education effect on Health-Related Quality of Life among Middle-Aged Urban Residents of West Ethiopia: Quasi-Experimental Study

Alemu Adeba*, Dessalegn Tamiru and Tefera Belachew

Department of Nutrition and Dietetics, Institute of Health, Jimma University, Jimma, Ethiopia

Corresponding e-mail: alemuadeba2017@gmail.com

ABSTRACT

Background: *Quality of life deteriorates due to unhealthy behaviors. Unhealthy lifestyle practice is high in west Ethiopia; it leads to poor quality of life, however, no intervention is given.* ***Objective:*** *To evaluate the effect of a lifestyle education intervention on quality of life in healthy middle-aged urban residents.* ***Methods:*** *A quasi-experimental design was applied from 1st February to 30th July 2019 on 266 unscreened healthy adults aged 41-64 years. A face-to-face educational approach was reinforced on 133 intervention participants. The status of quality of life was measured at baseline and post of six-month intervention using EQ-5D tools. Statistical significance was described at $p \leq 0.05$.* ***Results:*** *Intervention group showed significant improvement of health-related quality of life as compared to the control group in six-month lifestyle changes. In the intervention group, the prevalence of poor quality of life declined by 1.2% as compared to baseline. Likewise, physical activity level, diet diversity, and sleep pattern showed improvement due to lifestyle education intervention. Prevalence of poor quality of life scores significantly declined by 2.5% ($p<0.001$) among participants who had pain/discomfort in the intervention group. With sex-stratified, usual activity difficulty decreased the male's quality of life by more than five times (OR: 5.44; 95% CI 1.28-23.04, $p=0.022$) as compared to females.* ***Conclusion:*** *Community-based lifestyle education targeted to middle-aged adulthood significantly improved health-related quality of life in western Ethiopia.*

Keywords: Healthy lifestyle, Education, Health-related quality of life, Middle-aged

INTRODUCTION

Unhealthy lifestyle behaviors may be long-term risk factors for chronic conditions in adulthood [1]. A healthy lifestyle is a way of life that provides, maintains, and promotes the individual's health and wellbeing, and quality of life [2].

HRQoL systematically measures the relationship between health and health status with Quality of Life (QoL) [3,4]. The ability to identify indicators of poor HRQoL is crucial for both improving clinical care and determining targets of intervention for the prevention and treatment of diseases [5]. HRQoL assesses how an individual's well-being may be affected by a disease, disability, or disorder over time [6,7].

Despite growing awareness of the importance of HRQOL assessment for adults, much of the research to date has focused on specific diseases. To the best of our scan, in Ethiopia, few studies have attempted to identify predictors of HRQOL among adults, but interventions specific to middle-aged adults are not given [8-11].

Lifestyle behaviours vary from the individual level to population. Modifying lifestyle behaviours interventions are aimed to improve the health of the community. However, there are insufficient data regarding the effect of healthy lifestyle education including diet, physical activity, alcohol, and use smoking on health-related quality of life. The purpose of this study aimed to evaluate the effect of six-month healthy lifestyle education on health-related quality of life among middle-aged urban residents of western Ethiopia.

METHODS

Study Design

A quasi-experimental independent samples pretest and posttest group was applied to evaluate the change because of healthy lifestyle education effect between intervention and control group on health-related quality of life among middle-aged adulthoods.

Study Period

The education was given from 1 February to 30 July 2019 for the intervention group and post-test data was collected in August 2019.

Recruitment of Participants and Sampling Techniques

We determined the sample size for each objective using information from different kinds of literature and the largest value will be taken to conduct the study. Since there was no prior study at the study site regarding metabolic syndrome, the minimum sample size was calculated using single proportion formula taking prevalence of dependent variable among healthy Ethiopian adults. According to Tran A, et al., the most common component of metabolic syndrome is abdominal obesity with 19.6% prevalent [12]. So, with a margin of error of 5%, a confidence level of 95%, and 10% gnawing away, a minimum sample of 266 participants. From six communes of Nekemte city, two communes having not adjacent natural bounder but homogeneous in terms of socioeconomic and geographically were selected. Accordingly, one commune was randomly selected and the other purposively allocated with buffering zone through the natural geographical boundary to avoid contamination.

Operational Definition

Health-Related Quality of Life (HRQoL) is the perceived effect of health status on Quality of Life (QoL) which includes EQ-5D. EuroQol 5-dimensions measures HRQoL using validated five domains: mobility; self-care; discomfort/pain, depression/anxiety, and usual activities [13-15]. Each item is answered using one of three responses: no problem, some problems, and extreme problems. It is the golden standard and recommended by NICE for use in cost-effectiveness analysis [4,16].

Low HRQOL: Because no previously established cut-points for defining the scores are available, participants were categorized as having low HRQOL if their score is in the lowest tertile of the distribution for the current study population.

Grouping Participants into Intervention and Comparison

One commune was randomly allocated to the intervention from the six communes and the ‘wait-listed control group (1 commune) using purposive sampling, which is geographically separated to avoid contamination and information exchange between groups, giving a total of 266 participants at baseline evaluation. The participants were divided into intervention (n=133) and comparison group (n=133); while the intervention one under planned healthy lifestyle education for 6 months. Healthy lifestyle education was presented to the participants using teaching aids by professionals. During the training sessions, a guide to improving healthy lifestyles for the adults, like a healthy diet, physical activity, smoking, risk alcohol, and chat; as well as the quality of life facts listed in the training manual were given for intervention group with the command to reduce information contaminations. On average, intervention participants attended 95% of the group sessions of 6 months duration (Figure 1).

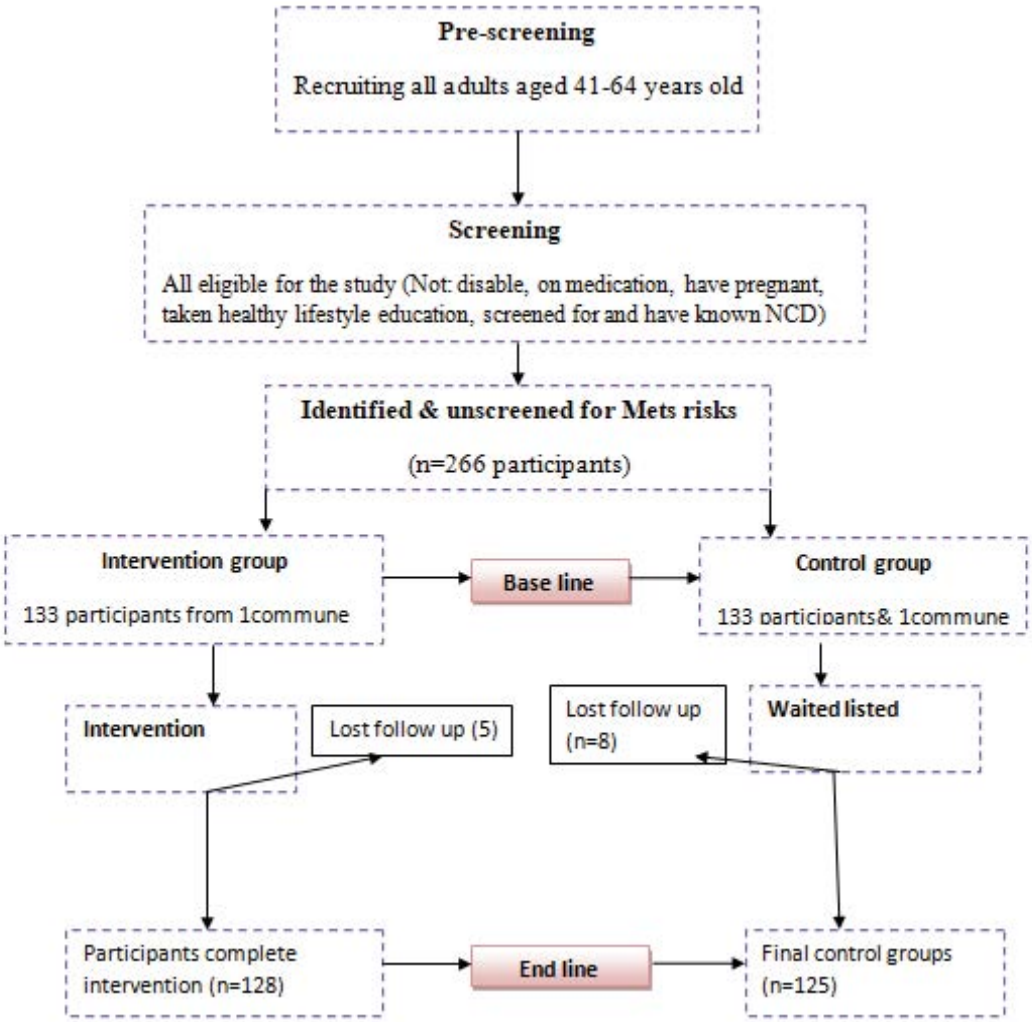

Figure 1 Flow diagram of the research procedure

System of Intervention Organization

There is strong evidence showing that chronic diseases can be prevented and controlled through comprehensive and integrated actions. Having this, a community-based healthy lifestyle education is given for reducing the poor health-related quality of life. The intervention comprises leaflets, healthy lifestyle education sessions, attending mass walking that provide information and encourage participants to improve their physical activity and healthy eating behaviours during the three months. The control group participants have received standard/routine health information and one-time advice during baseline.

Measurements were taken at baseline and post-intervention to evaluate program effectiveness and improvement of health-related quality of life. Meaning, quasi-experimental designs with untreated non-equivalent control group designs with pre-test and post-test. During education sessions, the participants (n=133) in the intervention commune were divided into four groups, that is, 33 participants per group and one general leader. To follow the intervention process seriously and reduce the dropout of study participants, systematically the team, each group, and the whole group was organized as shown in the following diagram below (Figure 2).

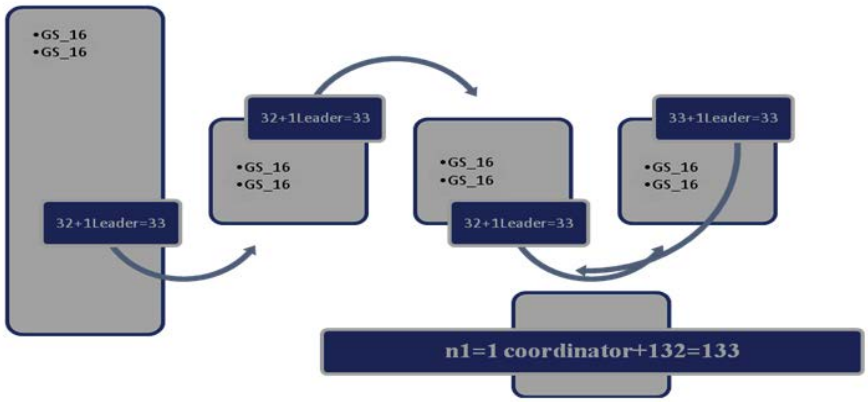

Figure 2 Flow diagram of the intervention control process

Eligible Criteria

All selected healthy individuals aged 41-64 years who were eligible to participate in the study and asked to undergo personal anthropometric measurements, respond to questionnaires, and biomarkers were included. While individuals receiving medication for NCDs; have taken part in any behavioural change program; pregnant/current lactating women; serious mental conditions; bariatric surgery; use of weight-impacting medication and physical disables was excluded.

Data Analysis

The data were collected at baseline and end-line then checked, entered into a pre-drafted coding sheet on Epi-info software (version 3.5.3) by two different data clerks. Data were transferred and analyzed using SPSS software (version 24, SPSS Inc., Chicago, IL, USA). Descriptive statistical tests were used, for continuous and categorical variables as frequencies and percentages (%). Binary logistic regression determines the odds ratio between the effect of education and poor HRQoL. The effectiveness of the education was evaluated by comparing intervention and comparison groups for the outcome measures of the HRQOL score. Socio-demographic, lifestyle factors, and clinical variables were used as explanatory variables. The significance level was considered at alpha ($p \leq 0.05$).

Data Quality Management

Questionnaires are prepared in English, and translated to Afan Oromo and back to English with the guidance of the language experts to keep their consistency. The training was given for data collectors and supervisors on the tools and data collection methods by the Principal investigators. Monitoring of intervention implementation was conducted by the principal investigator and supervisors. Filled questionnaires were checked for completeness and consistency of information by the supervisor on daily basis and entered into the software by data clerks and principals. Also to keep data quality and avoid measuring bias, the study objective and hypothesis were hidden from data collectors.

Ethical Endorsement and Dissemination

The research protocol was approved by Jimma University; Institute of Health; Institutional Review Board (IRB; Approval No: IHRPGD/596/2019). Individuals, who confirmed their willingness to participate in the study, signed a consent form. Confidentiality of the respondents was ensured and each individual had their identification number. All participants were provided with an information sheet and asked by the trained data collectors to sign a consent form before began healthy lifestyle education and be made aware that they are free to withdraw at any time. The results of the study will be disseminated through conference presentations and publications.

RESULTS

Participants' Characteristics

From 266 at baseline, about (95.11%) of the participants completed the six-month community-based healthy lifestyle

education. Comparatively more dropout (6.02%) was seen in the control group than in the intervention group. There were variables variations in gender between the intervention and control group. The gender distribution in the intervention group was 70.3% women and the control group was 56.8% women. Regarding age, more than half of the adults were in between 41-48 years (intervention group=53.1%, and control group=58.4%). Similarly, the majority of them had two poor lifestyle behaviours (intervention=82.8% and control groups=85.6%) (Table 1).

Table 1 Sociodemographic and lifestyles characteristics, West Ethiopia, 2019

Demographic		Intervention group			Control group		
		N	%	p-value	N	%	p-value
Gender	Female	90	70.3	0.324	71	56.8	0.021
	Male	38	29.7		54	43.2	
Age in years	41-48	68	53.1	0.646	73	58.4	0.873
	49-56	42	32.8		33	26.4	
	57-64	18	14.1		19	15.2	
Number of poor lifestyles	≤ 1	11	8.6	0.168	11	8.6	0.024
	=2	106	82.8		107	85.6	
	≥ 3	11	8.6		7	5.6	

Lifestyles Behavioral Changes due to Community Based Education

Healthy lifestyle adoption was improved among the intervention group as compared to the control group. The number of current smokers in the intervention group reduced from 3.8% to 2.3%. Similarly, current alcohol drunker withdraws by 9.4% from 11.3% and chat chewer declined from 1.5% to 0.8%. Besides the four major modifiable lifestyles factors, the prevalence of inadequate sleeping patterns decreased by 19.5% among the intervention group during post-test (Table 2).

Table 2 Community-based lifestyle education effect on lifestyle factors, urban, West Ethiopia, 2019

Variables	Categories	Intervention Group			Control group		
		Pre-test (%)	Post-test	p-value	Baseline	Post-test (%)	p-value
Dietary diversity score	Low<7food group	127 (95.5%)	90 (70.3%)	<0.001	130 (97.7%)	114 (91.2%)	<0.001
	High ≥ 7foodgroup	6 (4.5%)	38 (29.7%)		3 (2.3%)	11 (8.8%)	
Physical activity	Low	120 (90.2%)	66 (51.6%)	0.184	122 (91.7%)	103 (82.4%)	0.369
	Moderate +vigor	8 (9.8%)	62 (48.4%)		11 (8.3%)	22 (9.6%)	
Smoking	currently use	5 (3.8%)	1 (0.8%)	<0.001	1 (0.8%)	1 (0.8%)	<0.001
	Yes, quit now	12 (9%)	9 (6.8%)		9 (6.8%)	6 (4.8%	
Alcohol	currently use	15 (11.3%)	11 (8.3%)	0.166	11 (8.3%)	9 (7.2%)	0.001
	Yes, quit now	28 (21.1%)	12 (9%)		12 (9%)	11 (8.8%)	
Khat chewing	currently use	2 (1.5%)	1 (0.8%)	0.408	1 (0.8%)	0%	<0.001
	Yes, quit now	13 (9.8%)	5 (3.8%)		5 (3.8%)	6 (4%)	
Sleep deprivation	<6hrs/day	81 (60.9%)	53 (41.4%)	0.13	119 (89.5%)	102 (81.6)	0.279
	6-9hrs/day	52 (39.1%)	75 (58.6%)		14 (10.5%)	23 (18.4%)	

By classifying healthy lifestyle score, 8.8% of them have zero, 72.7% had 1-2 unhealthy lifestyle education and ≥ 3 unhealthy practices accounts 19.5%. All most of all outcome expectations significantly changed in the intervention

compared to the comparison group. Regarding physical activity, most individuals in the intervention and control group were showed low activity at baseline, 95.5%, and 97.7% respectively. The corresponding post-test values were 51.6% for intervention and 82.3% control group. The likely dietary diversity score of the intervention group showed significant improvement (70.2%; p<0.001) (Table 2).

Effect of Healthy Lifestyle Education on Physical Activity Level and Dietary Practices

In most of the HRQoL five dimensions, a slightly significant change was seen between the intervention and control groups. The sleep pattern after education intervention, the big difference was observed between control and intervention groups. More than half of (58.59%) of adults in the intervention had a good pattern of sleep during post assessment while only 10.2% of them have normal sleep time in the control group (Figure 3).

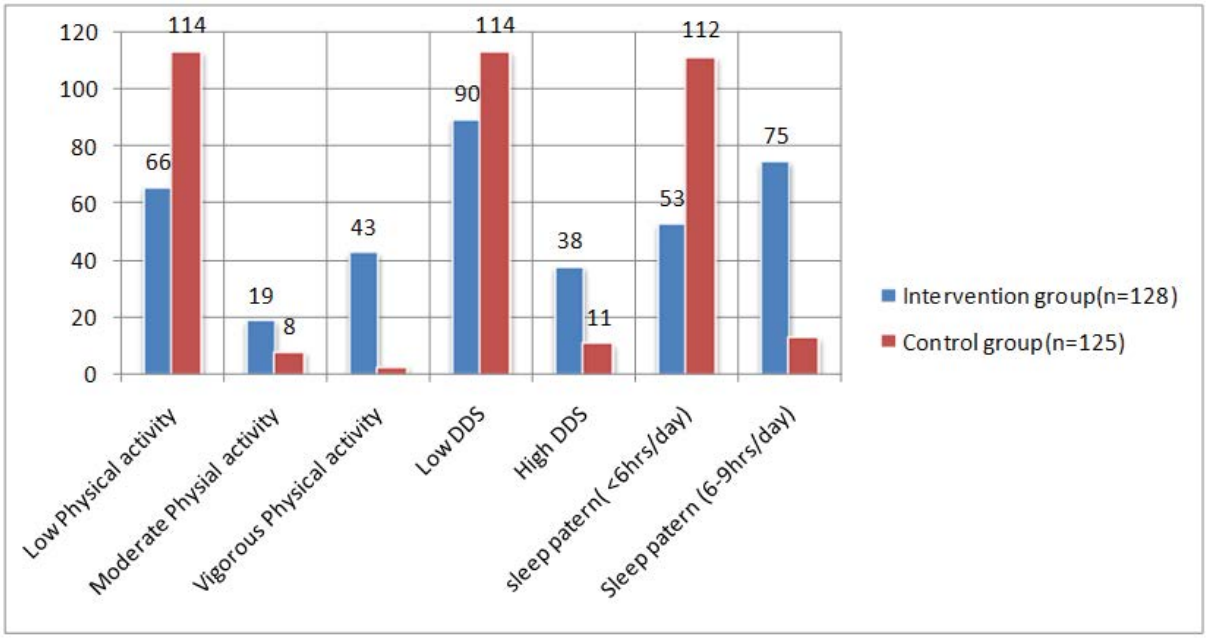

Figure 3 Status of physical activity, diet diversity, and sleep pattern for intervention and control group during post-test examination among middle-aged urban residents of West Ethiopia, 2019

Percentile Change across each EQ-5D by Poor HRQoL

This result showed that poor HRQoL scores slightly decreased in six-month intervention all over EQ-5D, except self-care problem as compared to the control group. Poor HRQoL scores significantly declined by 2.5% (p<0.001) among participants who had pain/discomfort in the intervention group as compared to baseline. Slightly the prevalence of anxiety/depression significantly increased by 0.8% (p<0.001) among the control group as compared to baseline while the little decline was obtained in the intervention group (Table 3).

Table 3 Change in quality of life scores between baseline and post of healthy lifestyle education, West Ethiopia, 2019

Poor HRQoL* EQ-5D Problem		Intervention Group				Control group			
		Baseline %	End Line %	%Change	p-value	Baseline %	End Line %	%Change	p-value
Pain/discomfort	No	83.5	85.9	-2.4	<0.001	86.5	87.2	-0.7	<0.001
	Yes	16.5	14.1	+2,4		13.5	12.8	0.7	
Anxiety/ Depression	No	83.5	83.6	-0.1	<0.001	88	88.2	-0.2	<0.001
	Yes	16.5	16.4	0.1		12	11.2	0.8	

Self-care	No	100	100	0	NS	98.5	98.4	0.1	0.002
	Yes	-	-			1.5	1.6	-0.1	
Usual activity	No	92.5	93	-0.5	<0.001	97.7	97.6	0.1	<0.001
	Yes	7.5	7	0.5		2.3	2.4	-0.1	
Mobility	No	94.7	95.3	-0.6	<0.001	92.5	92.8	-0.3	<0.001
	Yes	5.3	4.7	0.6		7.5	7.2	0.3	

Odds Ratios of Changing Scores across Each EQ-5dimension and HRQoL

Binary logistic regression analyses were accomplished to evaluate changing status of EQ-5D scores. Analyses revealed that men were more likely to report increased scores in the usual activity problem. Female participants were less likely to report increased scores in the pain/discomfort dimension compared to males. Being having a usual activity problem decreased the male's HRQoL more than five times (OR: 5.44; 95% CI 1.28-23.04) as compared to females. Concerning advancing age, participants were slightly showed increased scores in all dimensions of HRQoL. Being aged between 47-56 years old slightly showed increased scores in the mobility problem domain compared to age between 41-48 years (Table 4).

Among the control group, in age between 49-56 years the probabilities of increased scores were less likely in the pain/discomfort (OR 1.77; 95% CI 0.41-7.60), anxiety/depression (OR 1.81, 95% CI 0.57-5.70) dimensions and overall HRQoL (OR 3.33, 95% CI 1.15-9.65; p=0.022) in male (Table 4).

Table 4 Odds ratios of changing scores on intervention group in the specific dimensions and HRQoL and its overall score among middle-aged urban residents, West Ethiopia, 2019

Covariates		Mobility		Usual activity		Pain/discomfort		Anxiety/depression		Poor HRQoL	
		OR	95% CI.	OR	95% CI.	OR	95% CI.	OR	95%CI	OR	95%CI
Sex	Male	1.19	0.21; 6.82	5.44	1.28; 23.04	0.9	0.30; 2.72	1.58	0.60; 4.19	1.52	0.67; 3.44
	Female	1		1		1		1			
Age in years	41-48	5.15	0.52; 51.27	1.23	0.26; 5.79	0.92	0.18; 4.85	2.08	0.43; 10.1	0.87	0.27; 2.79
	49-56	8.38	0.72; 98.19	2	0.34; 11.90	2.18	0.42; 11.3	1.08	0.19; 6.17	1.3	0.39; 4.39
	57-64	1		1		1		1		1	

DISCUSSION

This study was given a face-to-face healthy lifestyle education for the intervention group for six months based on the long-term effectiveness of longitudinal study while nothing for the control group rather than routine health information. The finding of the study revealed a reduction in the prevalence of poor HRQoL and significant improvement of lifestyles was seen in the intervention group compared to the control group.

Lifestyle education intervention helps to reduce unhealthy behaviours that increase the risk of developing metabolic abnormalities and reduce the quality of life [17]. The study in California among the Latino population showed that sedentary behaviour decreased by 38% and moderate physical activity increased by 29% in the guided imagery intervention group when compared to the digital storytelling intervention group [18].

Another study conducted on physical activity and quality of life shows that increased physical activity has a positive impact on various aspects of quality of health [19]. Adopting physical activity and dietary habits enhanced the HRQoL [20-22]. The result of this study also forms that the intervention group showed significant change in major modifiable lifestyle behaviours and slight improvement was obtained on HRQoL.

In line with the above studies, our finding showed physical inactivity declined by 38.6% among individuals who had taken healthy lifestyle education. Additionally, an improvement was also observed in the intervention group in terms

of sleep adequacy pattern and increased by 19.5% at six months post-test. As found in the current study, nutrition and health education have been previously shown to improve dietary behaviour and physical activity [23-25].

In general, health-related quality of life showed improvement in six months of intervention on participants who had undergone healthy lifestyle education.

CONCLUSION AND RECOMMENDATIONS

The prevalence of health-related quality of life and its EQ-5Dimensions were found to improved more among adults who undergo healthy lifestyle education for six months as compared to the control group.

Limitations

Whatever randomization was not feasible for this community intervention for various reasons, quasi-experimental lacking randomization in sampling technique would be key to generalizing the study's outcomes and results. Another other thing is that there was a lack of midline examination about the effect of education at three months and six-month limited short time intervention.

DECLARATIONS

Contributors

The authors designed the study, drafted the manuscript have read and approved it for publication.

Funding

The data collection process is financially supported by the Institute of Health Sciences, Jimma University, Ethiopia, but the authors did not take funds for publication.

Availability of Data and Materials

All data were included in the main document.

Conflicts of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

REFERENCES

[1] Ozcanarslan, Fügen, Nelya Lukpanovna Shapekova, and Behire Sancar, eds. "Recent Developments in Nursing and Midwifery." *Cambridge Scholars Publishing*, 2018, pp. 327-43.

[2] Hekmatpou, Davood, Mohsen Shamsi, and Majid Zamani. "The effect of healthy lifestyle educational programs on the quality of life of the elderly in Arak." *Journal of Arak University of Medical Sciences,* Vol. 16, No. 3, 2013.

[3] Saarni, Samuli I., et al. "The impact of 29 chronic conditions on health-related quality of life: A general population survey in Finland using 15D and EQ-5D." *Quality of life Research,* Vol. 15, No. 8, 2006, pp. 1403-14.

[4] Van Reenen M, Oppe M. "EQ-5D-3L user guide: basic information on how to use the EQ-5D-3L instrument." 2015. http://www.euroqol.org/fileadmin/user_upload/Doc¬umenten/PDF/Folders_Flyers/EQ-5D 3L_UserGuide_2015.pdf

[5] Kindig, David A., Bridget C. Booske, and Patrick L. Remington. "Mobilizing Action Toward Community Health (MATCH): Metrics, incentives, and partnerships for population health." *Preventing Chronic Disease,* Vol. 7, No. 4, 2010.

[6] Wikipedia. "Quality of life (healthcare)." 2016. https://en.wikipedia.org/wiki/Quality_of_life_(healthcare)

[7] Health-Related Quality of Life (HRQOL). "HRQOL Concepts." Centers for Disease Control and Prevention. 2018. https://www.cdc.gov/hrqol/concept.htm

[8] Jufar, A. H., F. G. Nuguse, and H. G. Misgna. "Assessment of health-related quality of life and associated factors among hypertensive patients on treatment at public hospitals in Mekelle, North Ethiopia." *Journal of*

Hypertension, Vol. 6, No. 1, 2017.

[9] Reba, Kidist, et al. "Health-related quality of life of patients with diagnosed type 2 diabetes in Felege Hiwot Referral Hospital, North West Ethiopia: A cross-sectional study." *BMC Research Notes,* Vol. 11, No. 1, 2018, pp. 1-6.

[10] Muze, Mohammed, et al. "Health-related quality of life and its associated factors among diabetic patients attending diabetes clinic in Jimma university teaching hospital, Ethiopia, 2014." *Journal of Diabetes & Metabolism,* Vol. 8, No. 7, 2017.

[11] Gebremedhin, Tadesse, Abdulhalik Workicho, and Dessie Abebaw Angaw. "Health-related quality of life and its associated factors among adult patients with type II diabetes attending Mizan Tepi University Teaching Hospital, Southwest Ethiopia." *BMJ Open Diabetes Research and Care,* Vol. 7, No. 1, 2019, p. e000577.

[12] Tran, A., et al. "Prevalence of metabolic syndrome among working adults in Ethiopia." *International Journal of Hypertension,* Vol. 2011, 2011.

[13] Lawlor, Katherine, et al. "A qualitative study of the physical, social and attitudinal environments influencing the participation of children with cerebral palsy in northeast England." *Pediatric Rehabilitation,* Vol. 9, No. 3, 2006, pp. 219-28.

[14] Janssen, M. F., et al. "Measurement properties of the EQ-5D-5L compared to the EQ-5D-3L across eight patient groups: A multi-country study." *Quality of Life Research,* Vol. 22, No. 7, 2013, pp. 1717-27.

[15] World Health Organization. "WHOOQOL: Measuring Quality of Life: Introducing the WHOQOL Instruments http://www. who. int/health info/survey/whoqol-qualityoflife/en." *Accessed July* 19 2018.

[16] Brazier, John, Mark Deverill, and Colin Green. "A review of the use of health status measures in economic evaluation." *Journal of Health Services Research & Policy,* Vol. 4, No. 3, 1999, pp. 174-84.

[17] Dalle Grave, Riccardo, et al. "Lifestyle modification in the management of the metabolic syndrome: Achievements and challenges." *Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy,* Vol. 3, 2010, pp. 373-85.

[18] Weigensberg, Marc J., et al. "Imagine HEALTH: Results from a randomized pilot lifestyle intervention for obese Latino adolescents using Interactive Guided Imagery SM." *BMC Complementary and Alternative Medicine,* Vol. 14, No. 1, 2014, pp. 1-13.

[19] Acree, Luke S., et al. "Physical activity is related to quality of life in older adults." *Health and Quality of Life Outcomes,* Vol. 4, No. 1, 2006, pp. 1-6.

[20] Nigg, Claudio, et al. "Health correlates of exercise behavior and stage change in a community-based exercise intervention for the elderly: A pilot study." *Health Promotion Practice,* Vol. 3, No. 3, 2002, pp. 421-28.

[21] Discigil, Guzel, and Erdem Ozkisacik. "Impact of Mediterranean lifestyle on quality of life-A sample of East Mediterranean community." *Middle East Journal of Family Medicine,* Vol. 5, No. 3, 2007, pp. 8-12.

[22] Brown, David W., et al. "Associations between recommended levels of physical activity and health-related quality of life Findings from the 2001 Behavioral Risk Factor Surveillance System (BRFSS) survey." *Preventive Medicine,* Vol. 37, No. 5, 2003, pp. 520-28.

[23] Armitage, Peter, Geoffrey Berry, and John Nigel Scott Matthews. "Statistical methods in medical research." *John Wiley & Sons*, 2008.

[24] Liu, Yan, et al. "Effect of peer education on self-management and psychological status in type 2 diabetes patients with emotional disorders." *Journal of Diabetes Investigation,* Vol. 6, No. 4, 2015, pp. 479-86.

[25] Askari, F., S. Rabiei, and R. Rastmanesh. "The effects of nutrition education and diet therapy on glycemic and lipidemic control in Iranian patients with type 2 diabetes." *Journal of Obesity and Weight Loss Therapy,* Vol. 3, No. 5, 2013.