ISSN-0976-0245 (Print) • ISSN-0976-5506 (Electronic)

Volume 8 | Number 9 | October-December 2017

Indian Journal of Public Health Research & Development

An International Journal

SCOPUS IJPHRD CITATION SCORE

Indian Journal of Public Health Research and Development Scopus coverage years: from 2010 to 2017 Publisher: R.K. Sharma, Institute of Medico-Legal Publications ISSN:0976-0245E-ISSN: 0976-5506 Subject area: Medicine: Public Health, Environmental and Occupational Health

CiteScore 2015- 0.02

SJR 2015- 0.105

SNIP 2015- 0.034

Website:

www.ijphrd.com

Knowledge, Food Intake Pattern, and Body Mass Index of Overweight and Obese Adolescent Before and After Giving Social Media Health Education in Bulukumba Regency

Asnidar[1], A. A. Arsunan[2], Suriah[3], Kadek Ayu Erika[4], Muriyati[5]

1Lecturer in Health College of Panrita Husada, Bulukumba; 2Professor in Epidemiology Department, 3Lecture in Health Promotion Department, Faculty of Public Health, 4Lecturer in Nursing Science, Faculty of Nursing, Hasanuddin University; 5Lecturer in Health College of Panrita Husada, Bulukumba

ABSTRACT

Obesity is starting to become a health problem worldwide. Therefore, it must be addressed immediately. It is important to develop and evaluate interventions to reduce obesity prevalence by focus on behavioral therapy through health education. This study was aimed to determine differences in knowledge, intake patterns and BMI after giving health education for overweight and obese adolescent in Bulukumba District. This study was Quasi Experiment, which is pre-test and post-test with control group design. The groups in this study were divided into four; two treatment groups and two control groups. The first group was given health education through lectures with a booklet with WhatsApp application, the second group was given health education through lectures with booklets accompanied by text messages, the third group was given health education with lectures accompanied by leaflets and the fourth group was only given health education through media without lectures. The number of samples was 91 respondents. The results of Friedman's test analysis showed that there were differences in knowledge ($p<0.001$), differences in intake and BMI ($p<0.001$) in groups 1, 2 and 3, but no difference in intake patterns (energy $p=0.008$ and carbohydrates $p=0.027$) and BMI ($p=0.140$) in group 4. The use of booklets in the provision of health education for adolescents is added by re-education through the use of social media WhatsApp application to increase knowledge, changes in intake patterns and BMI in overweight and obese adolescents.

Keywords: *Health education, overweight, obese, adolescent, BMI*

INTRODUCTION

Obesity is starting to become a health problem worldwide, even the WHO states that obesity is a global epidemic, so obesity is a health problem that must be addressed immediately. The prevalence of obesity continues to increase. In 2010, globally, the number of children under the age of five with more nutritional status was estimated at more than 42 million[1].

According to the World Health Organization (WHO) in 2014 the highest prevalence of overweight and obesity was in the United States 61% were overweight for all ages and 27% were obese, while the lowest was in South Asia which was 22% overweight for all ages and 5% for obesity. The prevalence of overweight among boys and girls aged between 11 years was highest in Greece (33%), Portugal (32%), Ireland (30%) and Spain (30%) while the lowest in the Netherlands (13%) and Switzerland (11%)[2].

Based on data from the Ministry of Health in 2007, the prevalence of obesity in children aged 6 and 14 reached 9.5% for men, 6.4% for women while in South Sulawesi, men were 7.4% and women were 4.8%. This condition increased from the 1990s which ranged from 4%[3]. In 2010 nationally, the problem of obesity at the age of 6-12 years was still high at 9.2% or still above 5.0%. The prevalence of obesity in boys aged 6-12 years is higher than the prevalence in girls, which is 10.7% and 7.7% respectively. Based on residence, the prevalence of obesity is higher in urban areas compared to the prevalence in rural areas, which is 10.4% and 8.1% respectively[4]. In 2013, the prevalence of nutritional status (BMI for Age) of children aged 5-12 years was 18.8% consisting of 10.8% overweight and 8% obesity

while in Indonesia aged 13-15 in 10.8 percent, consists of 8.3 percent fat and 2.5 percent very obese[5].

Obesity is a nutritional problem that is often encountered and has the potential to cause health problems due to various complications. This is important to note because obesity has a high risk of comorbidity, which in turn can also increase mortality[6].(6) Therefore, it is important to develop and evaluate interventions to reduce the prevalence of obesity. The way to address childhood obesity can be through behavioral therapy, namely diet and exercise combined with behavior modification through health education[7]. Health education is a dynamic process of behavior change with the aim of changing or influencing human behavior which includes components of knowledge, attitudes, or practices related to the goals of healthy living both individually, in groups and in the community, and is a component of health programs[8]. The purpose of this study was to determine differences in knowledge, intake patterns and BMI before and after being given health education for overweight and obese children in Bulukumba Regency in 2016.

MATERIALS AND METHOD

The design of this study uses "Quasi Experiment", which is pre-test and post-test with control group design. The study group in this study was divided into four groups consisting of two treatment groups and two control groups. The first group was given health education through lectures with a booklet with WhatsApp application, the second group was given health education through lectures with booklets accompanied by text messages, the third group was given health education with lectures accompanied by leaflets and the fourth group was only given health education through media without lectures. This research was conducted in September 2016 to March 2017 in public junior high schools 1,2,4 and 10 located in the city of Bulukumba district. The study population was all overweight and obese children in junior high school located in the city of Bulukumba district, the samples obtained in this study were 91 people who would be divided into 4 (four) groups including 2 (two) groups in treatment and 2 (two) group on control. Group 1 (first) consisted of 25 people, groups 2,3 and 4 each consisting of 22 people. The research sample was obtained by purposive sampling method. Data were presented and analyzed univariately and presented in the form of frequency distribution tables, bivariate tests using Friedman and repeated Anova tests to determine differences in knowledge, lifestyle and body mass index, before and after health education.

RESULTS

Characteristics of respondents showed that in groups 1, 2, 3 and 4 most of them were female, low father education, low maternal education, high family income, nuclear family structure, family culture supporting the incidence of obesity, and family health risks. While the characteristics of the obesity history of the elderly, in groups 1 and 4 are mostly in the risk category while the group 2 is risky and not risky in the same number and group 3 is mostly in the non-risk category. The homogeneity test (the Leneve's test) shows the existence of sample equality in all groups (Table 1).

Table 1: Characteristics of participant

Characteristics	Groups								p*
	I		II		III		IV		
	n (25)	%	n (22)	%	n (22)	%	n (22)	%	
Sex									
Male	12	48	8	36.4	9	40.9	6	27.3	0.048
Female	13	52	14	63.6	13	59.1	16	72.7	
Father's education									
High	9	36	8	36.4	6	27.3	1	4.5	0.000
Low	16	64	14	63.6	16	72.7	21	95.5	
Mother's education									
High	10	40	6	27.3	1	4.5	1	4.5	0.000
Low	15	60	16	72.7	21	95.5	21	95.5	

Conted…

Family Income									
High	18	72	18	81.8	8	36.4	6	27.3	0.064
Low	7	28	4	18.2	14	63.6	16	72.7	
Family Structure									
Core family	18	72	16	72.7	18	81.8	15	68.2	0.162
Big family	7	28	6	27.3	4	18.2	7	31.8	
Family Culture									
Support	25	100	20	90.9	22	100.0	22	100.0	0.398
Not support	0	0	2	9.1	0	0.0	0	0.0	
Obesity of parents									
Risk	13	52	11	50.0	9	40.9	13	59.1	0.702
Not risk	12	48	11	50.0	13	59.1	9	40.9	
Family health history									
Risk	20	80	13	59.1	14	63.6	17	77.3	0.008
Not risk	5	20	9	40.9	8	36.4	5	22.7	

*Leneve's test

Table 2: The changes of knowledge, intake, and BMI among overweight/obese adolescent

Variables	Measurement series (months)							Δ	p
	T0	T1	T2	T3	T4	T5	T6		
Knowledge*									
Group 1 (n = 25)	8.56	12.48	13.84	14.12	15.76	18.8	19.84	11.28	< 0.001
Group 2 (n = 22)	8.45	12.55	13.41	13.09	13.73	17	18.55	10.1	< 0.001
Group 3 (n = 22)	6.64	7.95	12.14	13.09	14.64	14.32	16.59	9.95	< 0.001
Group 4 (n = 22)	6.82	8.14	7.5	8.32	8.45	8.45	8.91	2.09	< 0.001
Energy intake pattern*									
Group 1 (n = 25)	182.4	179	174.68	171.44	167.24	164.24	160.2	-22.16	< 0.001
Group 2 (n = 22)	134.1	131.4	127	124.5	120.36	118.04	114.2	-19.89	< 0.001
Group 3 (n = 22)	151.1	148.7	145.81	143.63	140.86	138.6	136.0	-15.05	< 0.001
Group 4 (n = 22)	131.3	129.5	129.72	128.18	128.54	126.95	127.1	-4.22	0.008
Carbohydrate intake pattern*									
Group 1 (n = 25)	151.8	149	145.32	142.68	139.12	136.8	133.4	-18.44	< 0.001
Group 2 (n = 22)	87.72	85.68	82.86	80.86	78.4	76.45	73.9	-13.82	< 0.001
Group 3 (n = 22)	106.4	104.6	102.72	101.18	99.09	97.77	95.81	-10.59	< 0.001
Group 4 (n = 22)	170.3	168.7	169.72	168.22	169.27	167.9	169.1	-1.18	0.270
Body mass index**									
Group 1 (n = 25)	2.49	2.44	2.36	2.28	2.2	2.12	2.09	-0.4	0.000
Group 2 (n = 22)	3.06	3.04	2.97	2.86	2.83	2.88	2.81	-0.25	0.000
Group 3 (n = 22)	1.89	1.85	1.83	1.79	1.71	1.68	1.61	-0.28	0.034
Group 4 (n = 22)	2.02	2.08	2.03	1.97	1.91	1.88	1.83	-0.19	0.140

*Friedman test; **Repeated ANOvA test

Table 2 shows that at the final measurement all respondents experienced an increase in knowledge scores compared to the initial measurements. This shows that there is a difference in knowledge at the beginning of the measurement compared to the second, third, fourth, fifth, sixth and seventh measurements. Friedman test results obtained $p<0.001$ for all groups, this indicates that there is a difference in children's knowledge in each group.

DISCUSSION

The differences (Δ) of knowledge among groups shows an increase when compared to between initial and endline measurement (T0-T6). This proves that by providing health education using booklets added with re-education through WhatsApp application can improve knowledge continuously. Judging from the difference in average knowledge increase, it turns out that the highest increase in knowledge was group 1 compared to group 2, group 3, and even group 4.

This is in line with the *Bullet Theory* reveals that the effectiveness of messages using media can be directly related to the intended target[9]. Techniques and media that can be used including text, images / audio only, audio visual and others. The level of media involvement in percent retention includes: 10% reading, 20% hearing, 30% viewing, 50% listening and seeing, saying 70% yourself, saying 90% and doing it yourself. The involvement of children in providing care will have a positive effect on their health. Providing information or health education especially to children should use interesting media. The use of technology can be another alternative in providing interesting health information to children[10].

This study used booklets in groups 1 and 2 in providing health education interventions. The results of the study proved that the mean difference before and after the intervention was greater in the group using the booklet than in the control group. This is in line with research conducted by Erika[11], with health education interventions using modules, showing the results that changes in mean knowledge before and after intervention were greater in the treatment group than in the control group[12]. A research conducted showed that there are significant differences in knowledge of elementary after booklets interventions[3]. The results showed that the highest change in group 1 was given health education interventions through lectures and booklets accompanied by education through social media (WhatsApp). Using social media in providing health education has an influence on increasing knowledge in adolescents. A study showed that health education programs for adolescents through social media are very useful[14].

Delivery techniques and methods are important factors that support the success of information transfer. The advantage of the method of delivering information through the WhatsApp application is that almost all students who were made as respondents in group 1 have a mobile that is equipped with WhatsApp and unpaid applications, and the communication can be more interactive and students are familiar with the application so that the acceptance of information about obesity is easily accepted by students. By providing education, this also has an effect because the more often children listen, read and see information about obesity and a healthy lifestyle, the better their knowledge will be.

The final measurement of the intake pattern of all respondents experienced a decrease in the average score of energy and carbohydrate intake compared to the initial measurement. The average energy and carbohydrate intake of all groups showed a decrease compared to the initial measurement and final measurement (T0-T6). This proves that the provision of health education using media can reduce energy and carbohydrate intake continuously and the use of booklet media is added with re-education through WhatsApp application can reduce energy and carbohydrate intake greater. In the analysis of each group found differences in groups 1,2 and 3 but there was no difference in group 4. Related research conducted by Kinard, in his research related to the effect of healthy food posting on consumer weight revealed that obese individuals are encouraged to build and maintain social network relationships with other people who regularly post healthy food pictures on their social media[15].

Intake of energy and carbohydrates. Aside from being a source of energy, food is also needed to replace damaged body cells and growth. Problems will arise if the food consumed exceeds the need. Excess energy will be stored in the body. If this condition occurs continuously, it will cause accumulation of fat in the body so that the risk of being overweight. The mother's behavior of unhealthy food preference, such as consuming sweet foods or high-energy drinks, can affect a child's food intake to similar foods. This, when viewed from the respondent's family culture related to food supply, it was found that in all the majority groups had a culture that

supported the occurrence of obesity distributed in group 1 (100%), group 2 (90.9%), group 3 (100%) and group 4 (100%).

The difference (Δ) of the average BMI score of all groups showed a decrease compared to the initial measurement and the final measurement (T0-T6). Repeated Anova test results obtained p groups 1 and 2 ($p<0.001$), group 3 ($p=0.034$), group 4 ($p=0.140$). This shows that there are differences in child BMI in groups 1,2 and 3 while in group 4 there is no difference. The highest increase in the mean BMI score in group 1, then group 3, group 2 and the lowest was the score in group 4. The results showed that the provision of health education could change children's BMI to decrease. Health education can change children's knowledge which in turn affects attitudes and behavior especially in the pattern of food intake. Changes in dietary intake patterns will affect BMI as a measure of children's nutritional status, because dietary patterns and physical activity are part of the causes of obesity amongst children.

Along with the increased knowledge in children about obesity related to understanding, causes, effects, ways of preventing and handling obesity and healthy lifestyles related to food intake patterns, this has an impact on changes in food intake patterns between initial measurements and final measurements. Changes in knowledge before and after the intervention are in line with changes in dietary intake patterns (energy and carbohydrates). The results showed that the average changes in energy and carbohydrate intake scores decreased in the final measurements compared to the initial measurements.

CONCLUSION

There are differences in knowledge, intake patterns and BMI of overweight and obese children after intervention. The provision of health education using booklets plus re-education through WhatsApp application shows changes in knowledge, intake patterns and BMI compared to other media.

Conflict of Interest: Nil

Source of Funding: Self-funded

Ethical Clearance: This study has received an ethical approval from the Hasanuddin University Ethics Commission with the number: 923 / H.04.8.4.5.31 / PP36-KOMETIK / 2016.

REFERENCES

1. World Health Organization, UNICEF, UNFPA and The World Bank. Trends in maternal mortality: 1990 to 2010. World Health Organization, UNICEF, UNFPA, and The World Bank Estimation. 2012; 1-59.
2. Bibiloni MM., Pons A., and Tur JA. Prevalence of Overweight and Obesity in Adolescents: A Systematic Review. ISRN Obese 2013: pp 1 – 14.
3. MoH. Basic Health Research year 2007. National Report 2008: pp.1 - 384. Available from: https://www.k4health.org/sites/default/files/laporanNasional%20Riskesdas%202007.pdf
4. MoH. Basic Health Research year 2010. National Report 2011: pp.1 – 354. Available from: http://kesga.kemkes.go.id/images/pedoman/Riskesdas%202010%20Nasional.pdf
5. MoH. Basic Health Research year 2007. National Report 2014: pp.1 – 306. Available from: http://www.depkes.go.id/resources/download/general/Hasil%20Riskesdas%202013.pdf
6. Faizah Z. Risk factor of obesity among school children aged 6 to 7 years old in Semarang. Thesis 2004.
7. DHO of South Sulawesi. Health Profile in South Sulawesi Province. Report of District Health Office of South Sulawesi Province 2013.
8. Notoatmodjo S. Public Health: Art and Science. Rineka Cipta 2007: Jakarta.
9. Liliweri A. Basics of Health Communication. Pustaka Pelajar 2007: Yogyakarta.
10. Raaff C, Glazebrook C, Wharrad H. A systematic review of interactive multimedia interventions to promote children's communication with health professionals: implications for communicating with overweight children. BMC medical informatics and decision making 2014; 14(1):1.
11. Erika KA. The influence of family empowerment modified model on the ability of family to control lifestyle and body mass index of overweight/obese children in Makassar. Theses 2014.

12. Erika KA. The Effect of the Transtheoretical Model Approach Towards the Body Mass Index of Overweight and Obese Children in Makassar. The Indonesian Biomedical Journal 2014: 6(1):51-56.

13. Zulaekah S. The effectiveness of nutrition education through booklet on nutritional knowledge of school age children. Jurnal Kesehatan Masyarakat 2012: 7(2).

14. Park BK, Nahm ES, Rogers VE, Choi M, Friedmann E, Wilson M, et al. A Facebook-Based Obesity Prevention Program for Korean American Adolescents: Usability Evaluation. J Pediatr Health Care 2017: 31(1): 57-66. PubMed PMID: 26952300. Epub 2016/03/10. eng.

15. Kinard BR. Insta-Grams: The Effect of Consumer Weight on Reactions to Healthy Food Posts. Cyberpsychol Behav Soc Netw 2016 Aug: 19(8):481-6. PubMed PMID: 27494330. Epub 2016/08/06. eng.

Published, Printed and Owned : Dr. R.K. Sharma
Printed : Printpack Electrostat G-2, Eros Apartment, 56, Nehru Place, New Delhi-110019
Published at: Institute of Medico Legal Publications Pvt. Ltd. 501, Manisha Building, 75-76, Nehru Place, New Delhi-110019 ,
Editor : Dr. R.K. Sharma, Mobile: + 91 9971888542, Fax No: +91 11 3044 6500