

Healthy Living Patterns Towards Diabetes Mellitus: A Literature Review

Ni Wayan Trisnadewi¹, Agus Supinganto^{2*}

¹ Wira Medika High School of Health Sciences, Bali, Indonesia

² Yarsi High School of Health Sciences, Mataram, Indonesia

³ Queensland University of Technology, Brisbane, Australia

*Corresponding Author: agusping@gmail.com²

ABSTRACT

Health problems that occur due to an unhealthy lifestyle are chronic diabetes mellitus type 2. Prevention of this disease needs to be done by improving lifestyle. This literature review is to describe lifestyle patterns associated with the incidence of type 2 diabetes mellitus. Database search used ProQuest, Science Direct, Pubmed, Cochrane Library, EBSCOhost, Sage Publications. The search keywords for articles were typed 2 diabetes, healthy lifestyle, healthy behavior, healthy living habits, healthy eating patterns, healthy activities, 31 articles were found and only 15 articles matched the analysis of objectives, suitability of topics, research methods used, sample size, ethics research, the results of each article, and the limitations. Results: The results showed that a healthy life was designed by habits in the family and the environment. Action against degenerative diseases that commonly occur in diabetes can be done by providing interventions to individuals, families, groups, and communities.

Keywords: activity, diabetes, diet, lifestyle

Received March 3, 2022; Revised April 22, 2022; Accepted May 20, 2022



STRADA : Jurnal Ilmiah Kesehatan, its website, and the articles published there in are licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.

BACKGROUND

Health is the most basic thing in human life. The health disorder that is a problem today is non-communicable diseases. One non-communicable disease that has significantly increased suffered by the world population is type 2 diabetes mellitus. This disease is growing rapidly, one of which is due to unhealthy habits or lifestyles. Basically, the creation of healthy habits involves repetitive performance of useful actions in a stable or continuous context. Interventions must be aimed at stopping unhealthy habits. Interventions that refer to habits will add to the existing media to promote the activity automatically from the desired and unwanted responses. Among the interventions, people will most likely make good choices when decisions are made to make those choices easy to implement. Interventions can be carried out on individuals, groups and communities (Demou, et al., 2018).

There are several interventions that can be used as a framework for building interventions to stop unhealthy habits and encourage useful habits. Habits play an important role in a person's failure to live a healthy lifestyle and keep living a good lifestyle for their health. Habits represent context-response relationships in memory that develop when people repeat behavior in daily life. Although some research on behavior change provides a good understanding of different types of interventions (for example, offering appropriate incentives, adjusting messages to a specific subset of the target audience), little attention is paid to the importance of habits in maintaining lifestyle choices. Therefore, habit-based interventions can be incorporated into health policies (Wood & Neal, 2007).

Intervention is an important program in the treatment and care of eating disorders, one of the factors that influence healthy lifestyles, and professionals and the community must pay attention to positive behavior in living a healthy lifestyle (Ardıç, Yavuz, & Zeren Öztürk, 2018). Higher adherence to a Healthy Lifestyle Score is associated with a lower risk of developing metabolic syndrome. Healthy Life Style can be a simple metabolic health promotion tool (Garralda-Del-Villar et al., 2019).

Healthy life interventions can be carried out on adolescents where further intervention is needed to understand how serious management programs can be delivered effectively to young people from various backgrounds and limitations (Christie et al., 2017). Diabetes prevention programs that are culturally adapted can be implemented in the community, by reducing some diabetes risk factors and increasing health-related quality of life (HRQOL). Collaboration with existing community partners shows the right direction to spread diabetes prevention in the community (Ibrahim, Moy, Awalludin, Ali, & Ismail, 2016).

METHODS

The method in this literature review is using a comprehensive strategy, such as searching for articles in a research journal. database, searching through the internet, reviewing articles. Article search is done using databases such as: ProQuest, Pubmed, Cochran Library, EBSCOhost, Sage Publications. Keywords used in the search are type 2 diabetes, healthy lifestyle, healthy behavior, healthy life habits, healthy diet, healthy activity. There were 31 articles analyzed through objective analysis, topic suitability, research methods used, sample size, research ethics, results of each article and limitations in the research in the article.

RESULTS

Table 1. Article review

Author	Title	Sample	Method	Output
(Ardıç et al., 2018)	Factor Affecting Healthy Life Style Behaviors in Adolescents; Eating Disorder/: A Systemic Review, 11 (3), 1352-1361. www.internationaljournalofcaringscience.org	1,500 abstract	Systemic review	One of the factors that influence a healthy, professional and community lifestyle is to pay attention to positive behavior in living a healthy lifestyle
(Garralda-Del-Villar et al., 2019)	Healthy Lifestyle and Incidence of Metabolic Syndrome in the SUN Cohort/: Nutrients 2019, 11, 65; doi:10.3390/nu11010065	10,807	Prospective cohort study	Higher adherence to a Healthy Lifestyle Score is associated with a lower risk of developing metabolic syndrome and can be a simple metabolic health promotion tool.
(Joy, Mann, & Blotnick, 2018)	Development, Feasibility, Acceptability And Potential Effectiveness Of A Healthy Lifestyle Program Delivered In Churches In Urban And Rural South Africa/: ONE 14(7):e0219787. https://doi.org/10.1371/journal.phone.0219787	13 participant (qualitative and 27 participant (quantitative data)	Mix Method design	The development of a community-based healthy lifestyle program for low-income blacks allows triangulation analysis and confidence in the conclusions of the research
(Demou et al., 2018)	Group-Based Healthy Lifestyle Workplace Interventions For Shift Workers: A Systematic Review/: Scand J Work Environ Health. 2018;44(6):568–584. Doi:10.5271/Sjweh.3763	696 abstract	Systematic review	Most interventions have a focus on physical activity, diet, and on a holistic intervention, namely weight loss.
(Christie et al., 2017)	A Community-Based Motivational Personalized Lifestyle Intervention To Reduce BMI In Obese Adolescents: Results From The Healthy Eating And Lifestyle Programme(HELP) Randomized Controlled Trial/: Christie D, Et Al. Arch Dis Child 2017;102:695–701. Doi:10.1136/Archdischild-2016-311586	174	RCT (linear Regression and logistic Regression)	HELP is no more effective at reducing BMI in a sample community of obese adolescents than a single educational session

(Natalia, Irina, Victoria, Irina, & Marianna, 2016)	Efficiency Of Using The Teaching Technology While Developing Healthy Lifestyle Skills In Arts Students/: Journal of Physical Education and Sport @ (JPES); DOI:10.7752/jpes.2016s1094	93	Survey, experiment, expert judgment	The newly created efficiency technology was proven by the improvement of the morphological parameters in the experimental group students.
(Ibrahim et al., 2016)	Effects of a Community-Based Healthy Lifestyle Intervention Program (Co-HELP) among Adults with Prediabetes in a Developing Country: A Quasi-Experimental Study/:PLOS ONE; DOI:10.1371/journal.pone.0167123 December 9, 2016	268	Quasi Experiment	This study proves that cultural adaptation of diabetes prevention can be applied in society by reducing risk factors and increasing HRQOL
(Cavaliere, De Marchi, & Banterle, 2018)	Exploring the Adherence to the Mediterranean Diet and Its Relationship with Individual Lifestyle: The Role of Healthy Behaviors, Pro-Environmental Behaviors, Income, and Education/: Nutrients 2018, 10, 141; doi:10.3390/nu10020141	42,000	Survey	The results of the study illustrate that the Mediterranean Diet is part of a lifestyle and emphasizes income and education in influencing adherence to the Mediterranean Diet.
(C. E. Draper, Grobler, Micklesfield, & Norris, 2015)	Impact Of Social Norms And Social Support On Diet, Physical Activity And Sedentary Behaviour Of Adolescents:A Scoping Review/: 2015 John Wiley & Sons Ltd; Doi:10.1111/Cch.12241	802 abstract	Scoping Review	This coverage study shows that there is an influence on parents, especially the positive impact of authority on parenting patterns, healthy behavior of adolescents in consistent healthy behavior.
(Sharpe, Wilcox, Kinnard, & Condrasky, 2018)	Community Health Advisors' Participation in a Dissemination and Implementation Study of an Evidence-Based Physical Activity and Healthy Eating Program in a Faith-Based Setting/: Journal of Community Health (2018) 43:694–704 https://doi.org/10.1007/s10900-018-0473-5	59 church	A group-randomized controlled trial	This study shows that with training and support, Community Health Advisors (CHA), shows that intervention, confidence, and competence have increased.

(Jilcott Pitts et al., 2015)	Associations Between Neighborhood-Level Factors Related to a Healthful Lifestyle and Dietary Intake, Physical Activity, and Support for Obesity Prevention Polices Among Rural Adults/: J Community Health (2015) 40:276–284 DOI 10.1007/s10900-014-9927-6	366	Cross-sectional	Research shows that perceptions of environmental factors related to diet and physical activity can influence the support of obesity prevention policies in various ways.
(Williams, Helsel, Griffin, & Liang, 2017)	Associations Between Parental BMI and the Family Nutrition Environment in a Community Sample/: J Community Health (2017) 42:1233–1239 DOI 10.1007/s10900-017-0375-y	2392	Person's Chi-squared test	there is a relationship between parental weight status, family nutrition and physical activity environment on children's eating patterns, children's physical activity, and setting limits on physical activity.

Various programs have been carried out to reduce the incidence of metabolic diseases or non-communicable diseases but until now the incidence of degenerative diseases continues to increase in the community. The programs that have been carried out include collaborating with existing community partners and is one of the ways that can be used as a promising channel for the dissemination of prevention of degenerative diseases, one of which is diabetes mellitus (Ibrahim et al., 2016).

The study was conducted to look at the influence of family, 10 studies assessed the impact of family influence on diet, six assessed the impact on physical activity, four assessed its impact on consistent behavior from a healthy lifestyle and 12 assessed its impact on obesity. Only eight studies investigated the influence of peers on adolescents, physical activity (three reviews), and unreachable behavior. This coverage review has shown sufficient evidence that the influence of parents of parenting style that has authority, has a positive impact on adolescent healthy behavior especially for dietary behavior compared to physical activity and consistent behavior in healthy living (C. E. Draper et al., 2015).

Interventions with groups are also conducted to train facilitators who have a role in helping to improve the competencies of the groups in increasing health promotion. The activity is carried out with training consisting of independent learning through electronic training modules, face-to-face training, and telephone-based training. This study shows that with training and support, Community Health Advisors (CHA), shows that intervention, selfconfidence, and competence have increased, and interventions for lifestyle can involve the community (Sharpe et al., 2018)(Catherine Elizabeth Draper et al., 2019).

The environment is perceived and objectively related to the quality of the diet, physical activity, and supports other research that shows that individual behavior can be influenced by the environment in which they live, work, and play. In addition, research shows that perceptions of environmental factors related to diet and physical activity can influence the support of obesity prevention policies in various ways. Subsequent research can determine the methods used to gather policy support for environmental change aimed at promoting health (Jilcott Pitts et al., 2015). Interventions on healthy living can be done

community-based, one of which is by involving churches in health promotion (Catherine Elizabeth Draper et al., 2019).

Families (especially parents / guardians) contribute significantly to the eating behavior and physical activity of children in their families. This influence is carried out through various means such as forming the child's environment; influence children's attitudes, beliefs, and values; serves as a social referral that provides various types of support and serves as a role model. The study is based on previous research by exploring the relationship between parental weight status and specific strategies for influencing a child's eating behavior and physical activity. There is a relationship between parental weight status, family nutrition and the physical activity environment, as well as the relationship between parental weight status and parenting behavior related to monitoring the child's diet, monitoring the child's physical activity, and setting limits for physical activity (Williams et al., 2017).

DISCUSSION

Healthy life behavior can be started from the family where the family has an important role in preparing nutrition for their family members, besides that the family also has an important role in healthy living behaviors such as dietary behavior, physical activity, prevention of obesity and healthy living behavior consistently. In addition, interventions to groups can also be done besides interventions to individuals. Some interventions were carried out by involving church members, the community, art students, shift workers and also families. Interventions for shift workers in improving healthy life style are less effective when given in groups than individually. The HELP (Healthy Eating & Lifestyle Program) intervention conducted to reduce the value of BMI in obese adolescents turned out to be less effective. Interventions in art students developed through teaching technology to improve healthy lifestyles show good results, then for the Co-HELP (Community Based Healthy Eating & Lifestyle Program) is an intervention in pre-picking involving families showing good results. Mediterranean interventions reveal that MD compliance is determined by a number of contributing factors. The Mediterranean Diet model not only represents healthy eating, but is a complementary part of an individual's lifestyle along with pro-environment health and attitudes and behavior.

Another intervention that was also developed was through training using a module book namely Community Health Advisors' Training (CHA), and the results of the intervention, confidence, and competence have increased. Other research is the relationship between parental weight status and specific strategies to influence a child's eating behavior and physical activity. There is a relationship between parental weight status, family nutrition and the physical activity environment, as well as the relationship between parental weight status and parenting behavior related to monitoring the child's diet, monitoring the child's physical activity, and setting limits for physical activity. Interventions on healthy living can be done by involving individuals, families or groups and the community.

REFERENCES

- Ardıç, C., Yavuz, E., & Zeren Öztürk, G. (2018). Factors affecting healthy life style behaviors in workers working at a tea factory. *Aile Hekimliği ve Palyatif Bakım*, 11(3), 33.
<https://doi.org/10.22391/fppc.340044>.
- Cavaliere, A., De Marchi, E., & Banterle, A. (2018). Exploring the adherence to the mediterranean diet and its relationship with individual lifestyle: The role of healthy behaviors, pro-environmental behaviors, income, and education. *Nutrients*, 10(2). <https://doi.org/10.3390/nu10020141>.
- Christie, D., Hudson, L. D., Kinra, S., Wong, I. C. K., Nazareth, I., Cole, T. J., ... Viner, R. M. (2017). A community-based motivational personalised lifestyle intervention to reduce BMI in obese

- adolescents: Results from the Healthy Eating and Lifestyle Programme (HELP) randomised controlled trial. *Archives of Disease in Childhood*, 102(8), 695–701.
<https://doi.org/10.1136/archdischild-2016-311586>.
- Demou, E., Maclean, A., Cheripelli, L. J., Hunt, K., & Gray, C. M. (2018). Group-based healthy lifestyle workplace interventions for shift workers: A systematic review. *Scandinavian Journal of Work, Environment and Health*, 44(6), 568–584. <https://doi.org/10.5271/sjweh.3763>.
- Draper, C. E., Grobler, L., Micklesfield, L. K., & Norris, S. A. (2015). Impact of social norms and social support on diet, physical activity and sedentary behaviour of adolescents: A scoping review. *Child: Care, Health and Development*, 41(5), 654–667. <https://doi.org/10.1111/cch.12241>.
- Draper, Catherine Elizabeth, Tomaz, S. A., Zihindula, G., Bunn, C., Gray, C. M., Hunt, K., ... Wyke, S. (2019). Development, feasibility, acceptability and potential effectiveness of a healthy lifestyle programme delivered in churches in urban and rural South Africa. *Plos One*, 14(7), e0219787. <https://doi.org/10.1371/journal.pone.0219787>.
- Garralda-Del-Villar, M., Carlos-Chillerón, S., Diaz-Gutierrez, J., Ruiz-Canela, M., Gea, A., Martínez-González, M. A., ... Fernández-Montero, A. (2019). Healthy lifestyle and incidence of metabolic syndrome in the SUN cohort. *Nutrients*, 11(1), 1–16. <https://doi.org/10.3390/nu11010065>.
- Ibrahim, N., Moy, F. M., Awalludin, I. A. N., Ali, Z. M., & Ismail, I. S. (2016). Effects of a community-based healthy lifestyle intervention program (Co-HELP) among adults with prediabetes in a developing country: A quasi-experimental study. *PLoS ONE*, 11(12), 1–22. <https://doi.org/10.1371/journal.pone.0167123>.
- Jilcott Pitts, S. B., Keyserling, T. C., Johnston, L. F., Smith, T. W., McGuirt, J. T., Evenson, K. R., ... Ammerman, A. S. (2015). Associations Between Neighborhood-Level Factors Related to a Healthful Lifestyle and Dietary Intake, Physical Activity, and Support for Obesity Prevention Policies Among Rural Adults. *Journal of Community Health*, 40(2), 276–284. <https://doi.org/10.1007/s10900-014-9927-6>.
- Joy, P., Mann, L., & Blotnick, K. (2018). Creation of university wellness program healthy eating and active lifestyle supports: A knowledge-To-Action process. *Canadian Journal of Dietetic Practice and Research*, 79(1), 7–12. <https://doi.org/10.3148/cjdp-2017-021>.
- Natalia, Z., Irina, H., Victoria, I., Irina, S., & Marianna, R. (2016). Efficiency of using the teaching technology while developing healthy lifestyle skills in arts students. *Journal of Physical Education and Sport*, 16(1), 598–603. <https://doi.org/10.7752/jpes.2016.s1094>.
- Sharpe, P. A., Wilcox, S., Kinnard, D., & Condrasky, M. D. (2018). Community Health Advisors' Participation in a Dissemination and Implementation Study of an Evidence-Based Physical Activity and Healthy Eating Program in a Faith-Based Setting. *Journal of Community Health*, 43(4), 694–704. <https://doi.org/10.1007/s10900-018-0473-5>.

Williams, J. E., Helsel, B., Griffin, S. F., & Liang, J. (2017). Associations Between Parental BMI and the Family Nutrition and Physical Activity Environment in a Community Sample. *Journal of Community Health*, 42(6), 1233–1239.

<https://doi.org/10.1007/s10900-017-0375-y>.

Wood, W., & Neal, D. T. (2007). *maintaining health behavior change*. 71–84.