



Evaluation of Nutrition Education at Senior High Schools in Mamuju Regency West Sulawesi

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Abstract

Introduction: The 2018 Basic Health Research showed a high prevalence of anemia (32%), Chronic Energy Deficiency (36.3%), and overweight and obesity (16.0%) among adolescents. Nutrition education is crucial to be taught to adolescents from an early age. However, there is a lack of research on content related to nutrition education in textbooks of school policies on nutrition and health. This study aimed to evaluate the nutrition education on senior high schools in Mamuju Regency.

Methods: This qualitative study examined word by word of high school students textbooks' content of nutrition and health education. The main study material was textbooks used by high school students in Mamuju Regency. The research informants were students and teachers. The analysis was done through content analysis by examining words and pictures in the textbooks. Data was classified into the same categories to answer the research objectives.

Results: Only a small proportion of textbooks (0.17%) contain nutrition and health messages. The nutrition and health messages included the nutritional content of food, food labels, and physical activity such as how to do long jump. Informants did not get information on adolescent health and nutrition at school. In addition, there is currently no school policy regarding breakfast or healthy snacks in the school environment.

Conclusion: Balanced nutrition messages had not been published in textbooks and delivered regularly in schools. Policy makers should review the school curriculum to include nutrition and health messages for adolescents in the textbooks used.

Keywords: nutrition education; textbook; adolescent; high school students

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Introduction

Adolescents who receive adequate nutritional intake tend to have a better learning and academic performance than the adolescents who are malnourished. However, unhealthy eating patterns are a global public health risk contributing to obesity and non-communicable diseases

(NCDs), including diabetes, heart disease, stroke, and cancer.^{1,2} In addition, food insecurity and unhealthy food habit can impact their nutrition intake and anxiety in adolescents.^{3,4}

Adolescents in Indonesia are currently faced with triple burdens of malnutrition, namely chronic energy

deficiency (CED), obesity, and micronutrient deficiencies (anemia).⁵⁻⁷ Based on the Basic Health Research 2018, the prevalence of anemia in adolescents were 32%, or about 3 to 4 out of 10 adolescents suffered from anemia.^{8,9} The highest prevalence of CED risk in women of productive age is experienced by adolescents aged 15–19 years reaching 36.3%. In addition, the prevalence anemia among adolescents aged 13-15 years was 16.0% and 13.5% in adolescents aged 16-18 years.^{10,11}

One of the intervention strategies for preventing nutritional problems in adolescents is to promote balanced nutrition behavior through nutrition education from an early age.^{12,13} Social cognitive theory states that self-regulation consists of three processes: self-monitoring, judgment, and self-reaction. Self-reaction can increase one's motivation and maintain the desired result. Teachers play an important role in providing classroom-based nutrition education. When teachers provide nutrition education, they are responsible for improving students' nutrition knowledge, self-efficacy, and behavior. The process is similar to the teacher's responsibility for learning outcomes in subjects such as mathematics, science, and civics.¹⁴

Schools are an environment that is quite effective in developing strategies to create a conducive environment in providing nutrition and health education and practices for adolescents.¹⁵ School health policies can potentially improve nutrition education which can have implications for balanced nutrition practices for students. The nutrition policy implemented in schools is important because it pays attention to the role of nutrition, which is often considered not part of the school activities.¹⁶ School policies cover nutrition education materials provided in daily lessons, school canteens' availability, and intra and extracurricular activities.¹⁷

Nutrition education is essential to be taught to adolescents from an early age. However, a lack of research was done on nutrition education materials in textbooks and school policies on nutrition and health still needs improvement, especially in

Mamuju, West Sulawesi, the second province with the highest prevalence of stunting in Indonesia.¹⁰ Therefore, this study aimed to analyze the nutrition education materials and the quality of health policies in Mamuju Regency. This research is expected to be one of the bases for preparing nutrition interventions for adolescents at school.

Methods

This study aimed to analyze the nutrition education and the quality of health policies in any types of Senior High Schools in Mamuju Regency. This study was done in a qualitative method and analyzed with a content analysis approach. Qualitative content analysis is a method for classifying written or spoken material into categories identified with the same meaning, representing explicit communication or inference.^{17,18} This research method examines word by word the content of the textbooks used by high school students.

The samples in this study were all textbooks used by the high school students in Mamuju. The research team documented all textbooks, both printed books and e-books, used by students from grades X, XI, and XII in Senior High School. This research has been reviewed and approved by the Bioethics Commission for Medical/Health Research, Faculty of Medicine, Sultan Agung Islamic University Semarang and cleared with letter of No.110/III/2023/Komisi Bioetik.

The initial analysis was carried out on the textbooks. In the early stages, the researcher read, and coded texts related to health and nutrition. Then the researchers categorized the coding into the themes that could answer the research objectives. The results of the analysis are displayed in narrative form.

Results

Seventy textbooks were analyzed in this study. In general, there were two kinds of books used by students, namely textbooks and books called Lembar Kerja Siswa (LKS) or Student Worksheets. Textbooks were available in the library and can be lent freely to students. The

textbooks were lent to the students when they were studying the topics. However, the most widely used books were LKS books.



Figure 1. Example of textbook used by students.

LKS books were simpler than textbooks. The LKS book was a student guide used to carry out investigative or problem-solving activities according to the studied topic. LKS was presented in a collection of sheets containing assignments for students according to basic competencies and based on the learning objectives to be achieved. LKS books were sold and purchased by students. There was no compulsion to buy the book, which can be purchased outside the school. The teacher only suggested to use the LKS, and the student decides whether to buy it or not.



Figure 2. Example of LKS books

The results obtained showed that health and nutrition was hardly addressed in the textbooks, and it was more frequently identified in science books. Our study found that only a small proportion of textbooks (0.17%) contain nutrition and health messages in the books used by senior high

school students. We found nutrition and health content only in 12 books out of 70 books. The provided nutrition and health messages covered topics such as the nutritional value of food, how to interpret food labels, and material about physical activity that explained the advantages of physical activity and how to do some exercise such as a long jump and volleyball.

Figure 3 describes an example of material about nutrition messages in the Biology LKS. This sub-material explains the guidelines for balanced nutrition and the menu for a balanced nutritional diet for daily intake. The material is accompanied by a picture of My Plate or known as '*Isi Piringku*' or '*My plate content*' in the Indonesian context. At the end of the explanation, there was the task of compiling a menu that must be done by students, as shown in Figure 4. In the LKS, students were assigned to arrange menus and calculate their Body Mass Index.

Materials on nutrition and health were mostly found in Biology and Physical Education, Sports, and Arts (*Pendidikan Jasmani, Olahraga dan Kesehatan – PJOK*) books. Unfortunately, biology books were only studied by students majoring in natural sciences. The students who had majoring in social sciences or vocational schools did not study biology books, so they were not exposed to nutrition and health material in the textbooks they used.

Only a small portion in other textbooks, such as Indonesian and English textbooks provided nutrition and health messages. This study did not find material on nutrition and health in social subject textbooks such as economics, art, history, and other books with social majors. It indicated that the material on nutrition and health was taught to students majoring in science only. Students majoring in social studies did not learn about nutrition because it was not listed in the textbooks or worksheets they are studying.

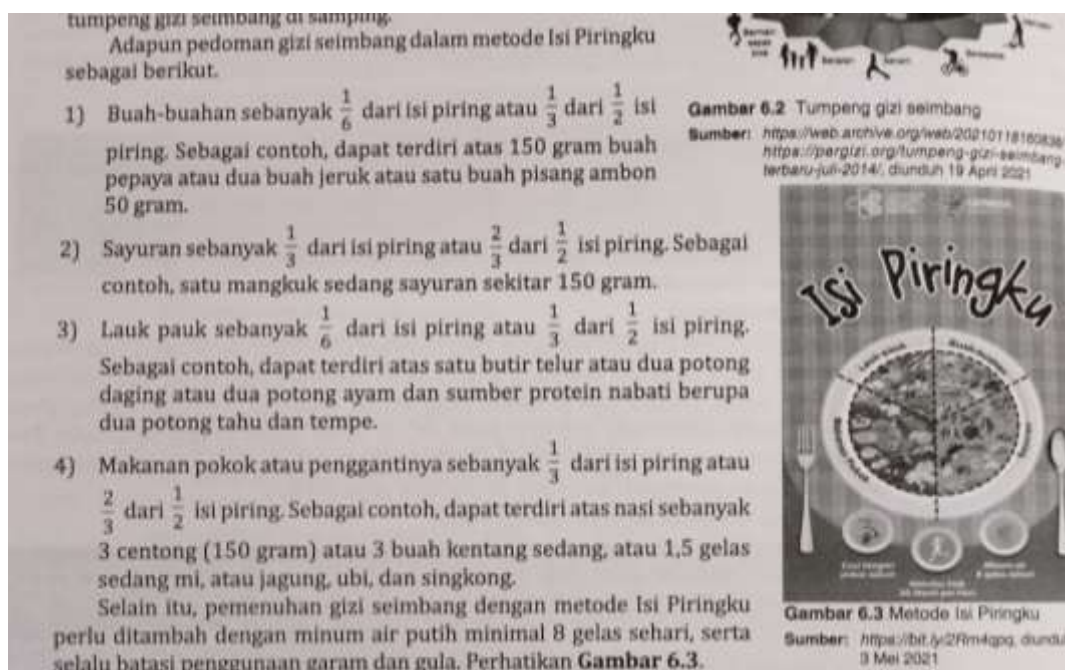


Figure 3. Example of LKS containing messages on nutrition and health in LKS Biology book 1st Semester Class XI.

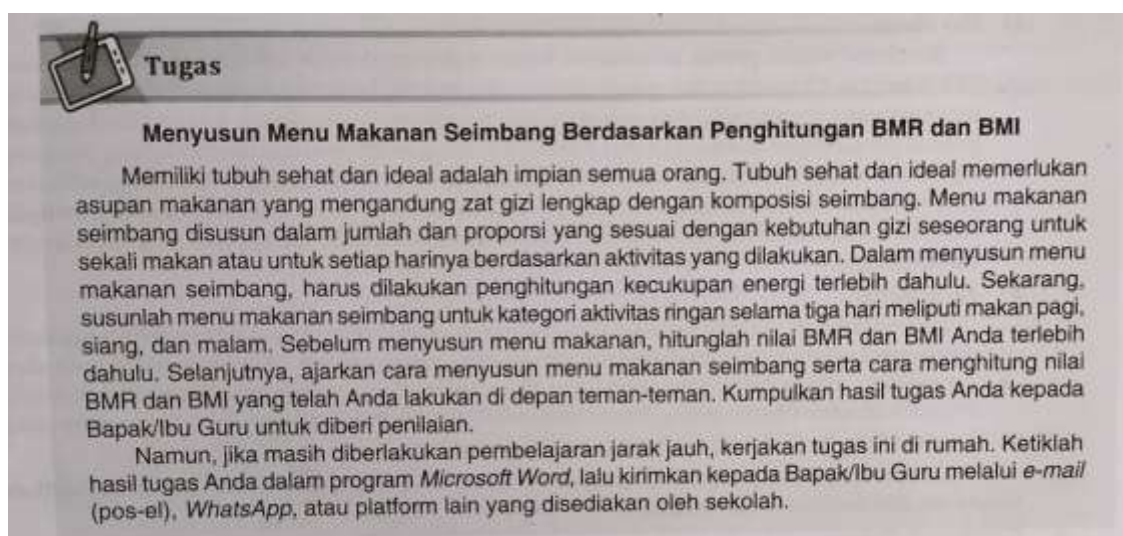


Figure 4. Examples of assignments in Biology LKS book.

Discussion

Schools provide an environment for acquiring knowledge and for building reading, numeracy, and thinking skills. Education is an important tool for socio-economic development and also has a positive impact on health. Schools are a major source of education and guidance regarding specific health issues. In addition, it offers the provision of health examinations and health service.¹⁹ This research uses a qualitative method with a content analysis approach, namely a

method for classifying written or spoken materials into categories identified with the same meaning, and these categories represent explicit communication or inference.¹²

Adolescents spend a lot of time at school every day, therefore schools are considered as an important place to encourage healthy behavior among adolescents.¹⁵ Textbooks are very important as an educational medium in schools because they can improve thinking and developing good behavior among

teenagers. The selection and use of textbooks as appropriate learning resource media is one of the supporting factors for success in learning. The benefits obtained from using textbooks include increasing students' attention and motivation to learn, as well as providing variety in learning that displays a structure that makes learning easier. Textbooks also present core learning information, provide more concrete examples, and stimulate analytical thinking in students so as to create a stress-free learning situation.²⁰

Textbooks and LKS books are learning media for conveying messages or information from teachers to students in the school environment.²¹ Learning media commonly used in schools are textbooks, student worksheets (LKS), modules, and diktats. In general, this learning medium has three features, including: 1) Media has the ability to capture, store, and display an object or event again; 2) Media has the ability to display objects or events again in various ways according to needs. 3). Media has the ability to display objects or events that contain meaning.²² Meanwhile, worksheets are widely used to make it easier for teachers to direct their students to discover concepts through their own activities or in working groups. Apart from that, worksheets can be used to develop process skills, develop scientific attitudes, and arouse students' interest in the material presented, including nutrition and health material with student-centered learning activities (student center).²³

School-based nutrition education programs play an important role in improving nutrition knowledge and behavior of school children. School health education had been proven as an effective way to increase knowledge and improving attitudes among students to practice a healthy lifestyle. One of the essential sources at school was textbooks.²⁴ Unfortunately, the results of this research showed that health and nutrition material was found only in textbooks and worksheets, which more frequently identified in science books, such as biology books. Our study found that of the 70 books analyzed, only a small portion of the books (0.17%) contained nutrition and health

messages in books used by high school students. Nutrition and health material was only found in 12 books out of 70 books. The nutrition and health messages contained include the nutritional content of food, food labels, and physical activity. The use of textbooks in the teaching and learning process in schools is very important. Textbooks are learning media that really help students learn subject matter, and students can use these textbooks repeatedly. Research conducted by Supriyo (2015) showed that learning using textbook media could improve students' understanding and achievement.²² Unfortunately, high school students in Mamuju used very little information about nutrition and health in their textbooks and worksheets.

Apart from being related to the material provided according to each department, the learning curriculum in schools was too dense to be one of the reasons for the lack of nutrition and health education material in schools. Therefore, if schools and the related policy makers wanted to include nutrition and health education materials, it is best to do so by building an efficient nutrition education program with minimal burden on schools.^{25,26}

Knowledge of nutrition and health is very important for teenage students to know to motivate them to improve the quality of their lives. Unfortunately, detailed nutrition material is not or has not been included in textbooks, worksheet books, or school curricula. Therefore, the information obtained is still very minimal. Under conditions like this, reading books related to adolescent nutrition and health should be available in school libraries in various types. The existence of this reading book can make it easier for students to access the information related to nutrition that they need.²⁷

Various research findings have validated that good nutritional knowledge can have an impact on good eating patterns in adolescents. It can be interpreted that a healthy lifestyle will be disrupted or not implemented if nutritional knowledge is not appropriate.²⁸ In line with this research, the high prevalence of overweight and obesity among adolescents can be caused by poor

and inadequate nutritional knowledge, which causes poor eating patterns, resulting in chronic health problems. Therefore, to promote healthier eating habits among teenagers, good nutritional knowledge is very important to be started at school.²⁹ Schools play an important role in promoting healthy eating and good nutrition and can create a supportive environment for teenagers. The link between good nutritional status and education has long been known. Adolescents who have good health and nutrition perform better in school, and a good education will provide adolescents with a foundation for the future, which in turn contributes to a country's economic and social development.¹⁶

Conclusion

Nutrition and health messages had not been well stated enough in textbooks and delivered regularly in high school students. Only a small proportion of textbooks (0.17%) contained nutrition and health messages. As nutrition education is a vital part of a comprehensive health education program and empowers students with knowledge and skills to have healthy food and beverage choices, policy makers should review the school curricula to include nutrition and health messages for adolescents in the textbooks used.

Ethics approval

This research received ethical approval from the Bioethics Commission for Medical Health Research, Faculty of Medicine, Sultan Agung Islamic University, Semarang No. 110/III/2023/Komisi Bioetik.

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References

1. Oddo VM, Roshita A, Khan T, Ariawan I, Ade L, Wiradnyani A, et al. Evidence-Based Nutrition Interventions Improved Adolescents' Knowledge and Behaviors in Indonesia. 2022;1–11.
2. Garcia OF, Serra E. Raising children with poor school performance: parenting styles and short-and long-

term consequences for adolescent and adult development. *Int J Environ Res Public Health*. 2019;16(7):14–7.

3. Nurbaya N, Najdah N. Food Security Status and Coping Strategies Among Adolescents During the Covid-19 Pandemic in Mamuju. *Poltekita J Ilmu Kesehat* [Internet]. 2023 May 31;17(1):130–6. Available from: <https://jurnal.poltekkespalu.ac.id/index.php/JIK/article/view/1894>
4. Najdah N, Nurbaya N, Irwan Z. Kebiasaan Makan dan Status Gizi pada Remaja di Mamuju menggunakan Adolescents' Food Habits Checklist. *J SAGO Gizi dan Kesehat* [Internet]. 2024;5(2):540–6. Available from: <https://ejournal.poltekkesaceh.ac.id/index.php/gikes/article/view/1678>
5. UNICEF. Social and Behaviour Change Communication Strategy: Improving Adolescent Nutrition in Indonesia. *Unicef*. 2021;1–83.
6. Ogden CL, Fryar CD, Martin CB, Freedman DS, Carroll MD, Gu Q, et al. Prevalence of Overweight, Obesity, and Severe Obesity Among Children and Adolescents Aged 2–19 Years: United States, 1963–1965 Through 2017–2018. *JAMA Intern Med* [Internet]. 2020 Sep 22;324(12):1208. Available from: <https://jamanetwork.com/journals/jama/fullarticle/2770158>
7. Rasmaniar R, Nurlaela E, Ahmad A, Nurbaya N. Pendidikan Teman Sebaya melalui Pemberdayaan Kader Posyandu Remaja terhadap Pengetahuan, Sikap, dan Perilaku Remaja tentang Manfaat Gizi dalam Pencegahan Stunting: Penelitian Kuasi Eksperimen. *Heal Inf J Penelit* [Internet]. 2022 Jun 30;14(1):76–88. Available from: <https://myjurnal.poltekkes-kdi.ac.id/index.php/hijp/article/view/498>
8. Nurbaya, Najdah N, Irwan Z, Saleh M. Peningkatan Pengetahuan Gizi dan Anemia pada Remaja melalui Pelatihan Pembuatan Media Promosi. *J Pengabdian dan Pengemb Masy Indones* [Internet]. 2023 May

- 23;2(1):28–33. Available from: <https://www.journalmpci.com/index.php/jppmi/article/view/123>
9. Hasyim M, Arief E, Nurbaya N. The Effect of Peer Assistance on Adherence to Consuming Iron Tablets and Anemia Status among Young Female Adolescents. *J Bidan Cerdas*. 2023;5(3):121–7.
 10. Kemenkes RI. Riset Kesehatan Dasar (RISKESDAS) 2018. Jakarta; 2018.
 11. Kasmawati K, Rasmaniar R, Nurlaela E, Koro S, Nurbaya N. Pelatihan Kader Posyandu Remaja dalam Upaya Peningkatan Keterampilan Kader Remaja. *J Masy Mandiri* [Internet]. 2023;7(3):1–6. Available from: <https://journal.ummat.ac.id/index.php/jmm/article/view/14292>
 12. Zahry NR, Cheng Y, Peng W. Content Analysis of Diet-Related Mobile Apps: A Self-Regulation Perspective. *Health Commun* [Internet]. 2016 Oct 2;31(10):1301–10. Available from: <http://dx.doi.org/10.1080/10410236.2015.1072123>
 13. Nurbaya N, Najdah N, Irwan Z. Education on Balanced Nutrition and Healthy Snacks in the School Environment to Prevent Nutritional Problems among Adolescents. *Poltekita J Pengabdian Masy*. 2023;4(3):821–7.
 14. Dunn CG, Burgermaster M, Adams A, Koch P, Adintori PA, Stage VC. A systematic review and content analysis of classroom teacher professional development in nutrition education programs. *Adv Nutr*. 2019;10(2):351–9.
 15. Babashahi M, Omidvar N, Joulaei H, Zargaraan A, Zayeri F, Veisi E, et al. Scrutinize of healthy school canteen policy in Iran's primary schools: a mixed method study. *BMC Public Health*. 2021;21(1):1–16.
 16. WHO. Implementing School Food and Nutrition Policies [Internet]. 2021. Available from: <https://www.who.int/publications/i/item/9789240035072>
 17. Kondracki NL, Wellman NS, Amundson DR. Content Analysis: Review of Methods and Their Applications in Nutrition Education. *J Nutr Educ Behav* [Internet]. 2012 Jul;34(4):224–30. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S1499404606600973>
 18. Shava GN, Hleza S, Tlou F, Shonhiwa S, Mathonsi E. Qualitative Content Analysis, Utility, Usability, and Processes in Educational Research. *Int J Res Innov Soc Sci* [Internet]. 2021;V(VII):2454–6186. Available from: www.rsisinternational.org
 19. WHO. Orientation programme on adolescent Health for health-care providers. 2018. 6 p.
 20. Rahmawati G. Buku Teks Pelajaran Sebagai Sumber Belajar Siswa Di Perpustakaan Sekolah Di Sman 3 Bandung. *EduLib*. 2015;5(5):102–13.
 21. Kazemian R, Ghasemi H, Movahhed T, Kazemian A. Health education in primary school textbooks in Iran in school year 2010-2011. *J Dent* [Internet]. 2014;11(5):536–44. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/25628680> <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=PMC4290773>
 22. Supriyo S. Pengaruh Buku Teks dan Cetak terhadap Hasil Belajar di SMA N 1 Marga Tiga Kabupaten Lampung Timur Pada Kelas XII. IPS Tahun Pelajaran 2013/2014. *PROMOSI (Jurnal Pendidik Ekon)* [Internet]. 2015 May 30;3(1):83–92. Available from: <https://ojs.fkip.ummetro.ac.id/index.php/ekonomi/article/view/145>
 23. Ermi N. Penggunaan Media Lembar Kerja Siswa (Lks) Dalam Meningkatkan Hasil Belajar Sosiologi Siswa Kelas Xi Sman 15 Pekanbaru. *J Pendidik* [Internet]. 2018;8(1):37–45. Available from: <https://jp.ejournal.unri.ac.id/> https://www.google.com/url?sa=i&rct=j&q=&esrc=s&source=web&cd=&ved=0CAIQw7AJahcKEwiQu43r5cL_AhUAAAAHQAAAAQBg&url=https%3A%2F%2Fjp.ejournal.unri.ac.id%2Fi

- ndex.php%2FJP%2Farticle%2Fdownload%2F4388%2F4204&psig=AOvVaw1iH9R
24. Nomoto M, Nonaka D, Mizoue T, Kobayashi J, Jimba M. Content analysis of school textbooks on health topics: A systematic review. *Biosci Trends* [Internet]. 2011;5(2):61–8. Available from: https://www.jstage.jst.go.jp/article/bst/5/2/5_2011.v5.2.61/_article
 25. Asakura K, Mori S, Sasaki S, Nishiwaki Y. A school-based nutrition education program involving children and their guardians in Japan: facilitation of guardian-child communication and reduction of nutrition knowledge disparity. *Nutr J* [Internet]. 2021;20(1):1–13. Available from: <https://doi.org/10.1186/s12937-021-00751-z>
 26. Taylor CA, Francony JJ, Beiting SR, Ritter J, Clutter JE. A Qualitative Content Analysis of Local School Wellness Policies for Ohio Schools. *ICAN Infant, Child, Adolesc Nutr* [Internet]. 2011 Feb 28;3(1):9–15. Available from: <http://journals.sagepub.com/doi/10.1177/1941406410396080>
 27. Februhartanty J, Ermayani E, Rachman PH, Dianawati H, Harsian H. *Buku Pegangan dan Kumpulan Rencana Ajar Untuk Guru Sekolah Menengah Pertama*. 2019.
 28. Oti JA, Amoah AN. Nutritional Knowledge and Food Consumption of Adolescent Students in Junior High Schools in a Rural Community in the Eastern Region of Ghana. *Am J Food Nutr* [Internet]. 2019;7(2):36–42. Available from: <http://pubs.sciepub.com/ajfn/7/2/1>
 29. Heymsfield G. Nutrition Knowledge of High School Senior Students in Northwest Arkansas. *Univ Arkansas, Fayettev* [Internet]. 2014;1–42. Available from: <https://scholarworks.uark.edu/cgi/viewcontent.cgi?article=1006&context=ghesuht>