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## Examination of the Theses Published in Family Medicine Related to Health Literacy With Social Network Analysis

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### ABSTRACT

**Background** In recent years, it has been seen that the concept of health literacy has an increasing interest in academic studies and theses published in Turkey. Within the scope of the study, the theses written on health literacy in the field of family medicine were evaluated. It was aimed to reveal the thematic development and knowledge structure of the theses published in this field.

**Material and Methods** Within the scope of this study, social network analysis was carried out based on the keywords obtained from the theses prepared with the target of health literacy. Theses included in the study were accessed via <https://tez.yok.gov.tr/UlusalTezMerkezi/>. The studies that include the phrase “health literacy” in the title were selected in the examination scope, and the keywords obtained from these theses were listed.

**Results** It is observed that the concept with the highest degree of centrality and betweenness centrality is “health literacy,” as expected. Following the keyword “health literacy,” the keywords “life quality,” “mortality,” “family medicine,” “vaccine,” and “diabetes mellitus” have the highest degree of centrality, respectively. It is observed that the betweenness centrality values of the “newest vital sign” and “life quality” keywords are quite high compared to the degree centrality values.

**Conclusions** Through this study, researchers can focus on issues that are not emphasized much, create original research questions and contribute to the literature. In addition, it may be important to reveal which concepts are associated with the concept of health literacy through this study.

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**Keywords:** Family medicine, health literacy, social network analysis, degree centrality, betweenness centrality.



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## Introduction

Health literacy has been defined by the World Health Organization (WHO) as “a set of cognitive and social skills that encourage individuals to access, understand and use the information to maintain and improve their good health and determine their abilities in these matters.”<sup>1</sup> According to the working definition developed by the Health Literacy Europe (HLS-EU) Consortium, health literacy is related to general literacy and accessing, understanding, evaluating, and applying health information to make decisions and make judgments in daily life related to health care, disease prevention, and health promotion to maintain or improve quality of life throughout life. It has a scope and framework that requires people’s knowledge, motivation, and competencies.<sup>2</sup>

Because all individuals need health services, it would not be wrong to say that everyone is a health user. The health sector has a very complex structure due to the constant changes in technology and information. In this complex structure, the individual’s health status is in question, and therefore, it is impossible not to have any knowledge or equipment. When it comes to the individual’s level of health knowledge, the concept of health literacy appears. At this very point, the importance of the patient’s ability to understand and interpret the medical information given to them and make decisions accordingly comes to the fore.

In the European Health Literacy study covering eight European Union member countries, it was determined that the health literacy level of the participants was inadequate at 12.4%, problematic at 35.2%, sufficient at 36%, and excellent at 16.5%. According to the national adult literacy study in the USA, 12% adequate, 53% medium level, 22% basic level, 14% below the basic level of health literacy were found.<sup>3</sup> In the study conducted in 2019, it was reported that 57.9% of the participants were found to have insufficient health literacy levels.<sup>4</sup>

In recent years, it has been seen that the concept of health literacy has an increasing interest in academic studies and theses published in Turkey. Within the scope of the study, the theses written on health literacy in the field of family medicine

were evaluated, and it was aimed to reveal the thematic development and knowledge structure of the theses published in this field. Thus, the present study aims to give an idea about the trend in the literature on family medicine studies that will work on health literacy in the future, create a research question, and guide them.

## Material and Methods

Within the scope of this study, which was evaluated with a bibliometric method, social network analysis was carried out based on the keywords obtained from the theses prepared with the target of health literacy. Theses included in the study were accessed via <https://tez.yok.gov.tr/UlusalTezMerkezi/>. The studies that include the phrase “health literacy” in the title were selected in the examination scope, and the keywords obtained from these theses were listed. As a result, 39 theses and 75 keywords obtained from these theses were included in the study. The bibliometric analysis comprises obtaining and analyzing data about a specific topic or range of issues. The bibliometric method applies mathematical and statistical methods to written communication tools such as books, journals, and articles.<sup>5</sup> By examining the articles and scientific papers in the literature with the bibliometric approach, the relationships between the documents can be statistically analyzed; and a general inference can be made about the relevant literature, and it can be determined how the articles have developed over time or the trend towards on the relevant topics.<sup>6</sup> Social network analysis (SNA) is a statistical method that can be widely used in interdisciplinary fields to analyze bibliometric studies in recent years.<sup>7</sup> SNA enables the examination and analysis of social networks. Social networks are structures that show the relations and ties between the units or actors interacting.<sup>8</sup> Within the scope of this study, the units are the keywords collected from the theses on health literacy in family medicine. Relationships and bonds between keywords are tried to be revealed and visualized. There are specific criteria used in social network analysis to indicate these relationships. SNA enables the review and analysis of social networks. Social networks are structures that show the relationships and links between units or actors interacting with

each other. For this study, units are the keywords taken from theses on health literacy in family medicine. SNA tries to reveal and visualize the relationships and links between keywords. There are specific criteria used in SNA to indicate these relationships. With social network analysis network map of keywords is visualized.

The centrality criterion is one of the essential criteria used in the SNA. In studies, centrality criteria can be used in two different ways as degree and betweenness centrality. With degree centrality, the sum of the connection numbers of the actors in the network with other actors is calculated. Actors with a high degree of centrality are in the most central position in the network.<sup>8</sup> A higher degree of centrality indicates a more central keyword; therefore, it can be interpreted as a common keyword that has been actively studied in the literature.<sup>9</sup> If it is considered within the scope of the study, keywords with a high degree of centrality have more ties with other keywords and are in a central position in the network map. Betweenness centrality indicates the degree to which an actor is between two unrelated actors. An actor with a high centrality betweenness establishes a connection and mediates between two actors that are not connected (Wasserman and Faust, 1994:188). Within the scope of the

study, the keywords obtained from 39 theses related to health literacy were examined by SNA, and the network map created by these keywords was tried to be revealed. Analyzes were performed in the UCINET<sup>10</sup> program. A 75 x 75 data matrix was prepared in the UCINET 6 program with 75 keywords obtained from the theses. It has been determined that different expressions are used for the concept of health literacy in some theses. These expressions were entered into the data matrix as a single keyword so that these expressions with the same meaning are not included in the matrix separately.

### Results

The cumulative distribution of theses published on health literacy in family medicine between 2016 and 2021 is given in Figure 1. When Figure 1 is examined, it is understood that the date when theses on health literacy in family medicine started to be written as 2016. There has been a noticeable increase in the number of theses since then. It is aimed to reveal the network structure of the keywords obtained from 39 theses by using SNA.

For this purpose, 75 keywords of 39 theses related to health literacy were processed into a

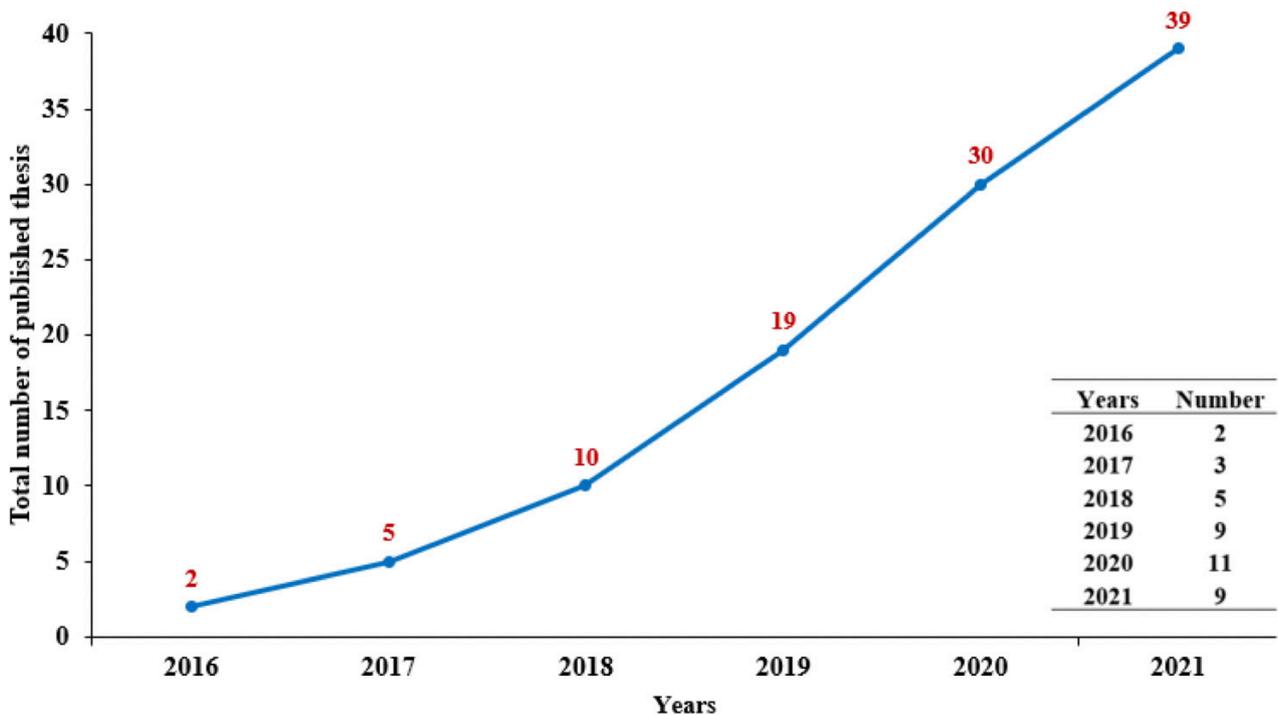


Figure 1. Distribution of the thesis according to the years.

75x75 data matrix and subjected to social network analysis. The degree and betweenness centrality findings regarding the keywords are given in Table 1. To avoid making the table too long, keywords with a degree centrality of less than six were not included.

When Table 1 is examined, it is observed that the concept with the highest degree of centrality and betweenness centrality is “health literacy,” as expected. Following the keyword “health literacy,” the keywords “life quality,” “mortality,” “family medicine,” “vaccine,” and “diabetes mellitus” have the highest degree of centrality, respectively. These keywords are the concepts with the highest number of links, the most focused on the network, and discussed in many theses. The concepts of “health literacy,” “newest vital sign,” and “life quality” have a high betweenness centrality. Keywords with high betweenness centrality connect concepts that are not related to each other by acting as a bridge. It is observed that the betweenness centrality values of the “Newest vital sign” and “life quality” keywords are quite high compared to the degree centrality values. Although the newest vital sign keyword is not used frequently in theses, it can be said that it brings together concepts that are not related to each other at a high rate. The network map of the keywords obtained from the theses written on health literacy in family medicine in the literature is given in Figure 2.

## Discussion

In today’s world, which is accepted as the information age, individuals are expected to recognize and identify their diseases and make decisions they think are suitable for their health. The ability to take these decisions correctly is related to the level of health literacy.<sup>11</sup>

Health literacy, which is included in the scope of health promotion, changes the lifestyle and living conditions of the individual, enabling him to acquire the level of knowledge, individual skills, and self-confidence that will lead him to behavior that will improve both individual and public health.<sup>12</sup> It supports and develops the ability of the individual to reach the correct information and service and the ability to use this service to protect and maintain health.<sup>13</sup> Thus, it strengthens the more effective use of existing health services, creating quality conditions in health services and the individual’s competence over his health and public health.<sup>14,15</sup> It has been shown that limited or inadequate health literacy is associated with poor health decisions, more risky health behaviors, worse health parameters, and increased use of the health system.

As the concept of health literacy has become popular in recent years, it is seen that a substantial number of studies are published every year in the field of medicine, taking this concept to the center.

**Table 1.** Top keywords with degree centrality and betweenness value for health literacy.

Keyword	Degree centrality	Keyword	Betweenness centrality
	Value		Value
Health literacy	72	Health literacy	2,528.50
Life quality	12	Newest vital sing	144
Mortality	9	Life quality	21
Family medicine	7	Mortality	8
Vaccine	7	Family medicine	6.50
Diabetes mellitus	7	Diabetes mellitus	5.50
Chronic disease	6	Vaccine	4.50
Primary health care	6	Primary health care	4
Hypertension	6	Chronic disease	3.83
Caregiver	6	Periodical examination	3
Periodical examination	6	Hypertension	2.67



these cases were handled together with cases that were not related to each other in different theses. In other words, these cases were not studied together with the same cases. The Newest Vital Sign scale consists of 6 questions and measures an individual's reading and understanding of a food label. It is advantageous because it measures calculation, reading, and comprehension aspects and has 3-6 minutes of application time. In the theses examined, different concepts were tried to be brought together, and their relations with health literacy were tried to be revealed by using this measurement tool.

## Conclusions

This study is a guide for researchers who want to work on health literacy in family medicine to show which subjects the concept of health literacy, which has gained popularity in recent years, is intensely associated with. Through this study, researchers can focus on issues that are not emphasized much, create original research questions and contribute to the literature. In addition, it may be important to reveal which concepts are associated with the concept of health literacy through this study.

### Conflict of interest

Author declare that there is no conflict of interest with regard to this manuscript.

### Authors' Contribution

Study Conception, Data Collection and/or Processing, Materials, Literature Review, Manuscript Preparation held by GO.

## References

1. WHO T. Health literacy and health behaviour. in 7th Global Conference on Health Promotion: track themes. Accessed at [https://cdn1.sph.harvard.edu/wp-content/uploads/sites/135/2015/09/neu\\_rev\\_hls-eu\\_report\\_2015\\_05\\_13\\_lit.pdf](http://www.who.int/healthpromotion/conferences/7gchp/track2/en/(on 10.01. 2017). 2015.</a></li>
<li>2. Consortium E H L S. Comparative report of health literacy in eight EU member states. 2012; Available from: Retrieved from Harvard University website:<a href=).
3. Akbal E, Gokler ME. COVID-19 salgını sürecinde eksikliği ortaya çıkan bir gerçek: Sağlık okuryazarlığı. *ESTÜDAM Halk Sağlığı Dergisi*. 2020;5:148-55 (in Turkish). doi: 10.35232/estudamhsd.763717.
4. Özdemir S, Hatice A Türkiye'de sağlık okuryazarlığı. *SDÜ Tıp Fakültesi Dergisi*. 2021;28:535-6 (in Turkish). doi: 10.17343/sdutfd.791741.
5. Sorensen RM, Jovanović B. From nanoplastic to microplastic: A bibliometric analysis on the presence of plastic particles in the environment. *Mar Pollut Bull*. 2021 Feb;163:111926. doi: 10.1016/j.marpollbul.2020.111926. E
6. Broadus RN. Toward a definition of "bibliometrics". *Scientometrics*. 1987;12:373-9. doi: 10.1007/Bf02016680.
7. Jang H, An JY. Social Network Analysis of Elders' Health Literacy and their Use of Online Health Information. *Healthc Inform Res*. 2014 Jul;20(3):216-25. doi: 10.4258/hir.2014.20.3.216.
8. Wasserman S, Faust K. *Social network analysis: Methods and applications*. Cambridge University Press; 1994.
9. Sohn D. *Social network analysis*. Korea: Kyungmun Publisher. Seoul, Korea: Kyungmun Publisher; 2010:1-21.
10. Borgatti SP, Everett MG, Freeman LC. *Ucinet for Windows: Software for social network analysis*. Harvard, MA: Analytic technologies; 2002:6.
11. Balçık PY, Taşkaya S, Şahin B. Sağlık okur-yazarlığı. *TAF Preventive Medicine Bulletin*. 2014;13(4):321-6 (in Turkish). doi: 10.5455/pmb1-1402386162.
12. Nutbeam D. Health promotion glossary. *Health Promot Int*. 1998;13(4):349-64.
13. Kutner M, Greenburg E, Jin Y, Paulsen C. *The Health Literacy of America's Adults: Results from the 2003 National Assessment of Adult Literacy*. NCES 2006-483. National Center for Education Statistics. 2006.
14. Sørensen K, Van den Broucke S, Fullam J, Doyle G, Pelikan J, Slonska Z, Brand H; (HLS-EU) Consortium Health Literacy Project European. Health literacy and public health: a systematic review and integration of definitions and models. *BMC Public Health*. 2012 Jan 25;12:80. doi: 10.1186/1471-2458-12-80.
15. Berkman ND, Sheridan SL, Donahue KE, Halpern DJ, Crotty K. Low health literacy and health outcomes: an updated systematic review. *Ann Intern Med*. 2011 Jul 19;155(2):97-107. doi: 10.7326/0003-4819-155-2-201107190-00005.
16. Wang HM, Beyer M, Gensichen J, Gerlach FM. Health-related quality of life among general practice patients with differing chronic diseases in Germany: cross sectional survey. *BMC Public Health*. 2008 Jul 21;8:246. doi: 10.1186/1471-2458-8-246.
17. Zheng M, Jin H, Shi N, Duan C, Wang D, Yu X, Li X. The relationship between health literacy and quality of life: a systematic review and meta-analysis. *Health Qual Life Outcomes*. 2018 Oct 16;16(1):201. doi: 10.1186/s12955-018-1031-7.
18. Song S, Lee SM, Jang S, Lee YJ, Kim NH, Sohn HR, Suh DC. Mediation effects of medication information processing and adherence on association between health literacy and quality of life. *BMC Health Serv Res*. 2017 Sep 16;17(1):661. doi: 10.1186/s12913-017-2598-0.
19. Fan ZY, Yang Y, Zhang F. Association between health literacy and mortality: a systematic review and meta-analysis. *Arch Public Health*. 2021 Jul 1;79(1):119. doi: 10.1186/s13690-021-00648-7.

