



Structural Analysis of Students' Health Literacy Based on Hidden Curriculum ,Teaching Effectiveness and Teachers' Health Literacy Through the Mediation of Academic Performance

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ARTICLE INFO

Article history:

Received:

13/07/2024

Accepted:

03/12/2024

Available
online:

Winter 2024

Keyword:

Health
Literacy,
Hidden
Curriculum,
Teaching
Effectiveness,
Academic
Performance.

Abstract

Health literacy of students plays a key role in ensuring their health. The present study aims to structurally analyze students' health literacy based on hidden curriculum, teaching effectiveness, and teachers' health literacy through the mediation of academic performance. The research method is descriptive-correlational type of structural equation model. The statistical population includes all 12th grade students (N=6940) of female high schools of all 5 districts, who have passed health course as well as all of the health course teachers (N=131) who are teaching in these schools. Using Krejcie and Morgan Table and by applying proportional stratified random sampling, the sample size of students was 365 and the sample size of health teachers based on the schools of the selected students was 100. The data of the present study were collected using three questionnaires of health literacy, teaching effectiveness, hidden curriculum and the final scores of students. Validity and reliability of questionnaires were examined and confirmed to be higher than 0.7. The results of structural equations modelling by PLS software showed that health literacy of students based on hidden curriculum, teaching effectiveness and health literacy of teachers through the mediation of academic performance of 12th grade in female high schools of Tabriz is predictable ($p<0.01$).schools and teachers have the main role and responsibility of promoting health literacy in students, and providing appropriate curricula to promote health literacy will lead to the improvement of health behaviors in students

Hashempoor, E., Talebi, B., & Adib, Y.,(2024). Structural Analysis of Students' Health Literacy Based on Hidden Curriculum ,Teaching Effectiveness and Teachers' Health Literacy Through the Mediation of Academic Performance, Journal of School Administration, 12(4),87-100.

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Introduction

Health Literacy (HL) is generally known as a set of individual capacities to achieve, process and understand the information and primary healthcare services, which supports suitable decision-making related to health or disease (Silva & Santos, 2021). Schools have a key role in promoting the students' health (Moghaddam Hosseini & Talebi, 2018). Students' HL is also known as one of the health education outputs in schools (Schulenkorf et al., 2021). According to the researches, 65 to 85 percent of healthcare is provided by students and their families without the intervention of experts, and the impact of self-care in improving health consequences and decreasing costs is reported in various studies (Schmidt et al., 2023). HL was defined as the ability of a person to acquire, interpret and understand the information and health services needed to make appropriate decisions (Charoghchian Khorasani et al., 2023) which includes a set of reading, listening, analysis and decision-making skills and the ability to use these skills in health-related situations (Ahmadzadeh sani et al., 2019), and now it is a global issue (Moharramzadeh et al., 2022). Many of the researches show that students with low HL are less interested in their health condition. Also, HL has a significant effect on health behaviors (Ameri et al., 2022; Rajabi et al., 2023) and quality of life (Hosseinkhani & Talebi, 2020).

According to Bandura social learning theory, it can be said that people react spontaneously to external stimuli and are influenced by influencers who are higher in personality and social status (Wosu, 2023). Therefore, it could be concluded that Hidden Curriculum (HC), Teaching Effectiveness (TE), the teachers' HL and Academic Performance (AP) of health course would promote HL level of students.

HC includes the factors which are not a part of formal curriculum but affect the students' thought, emotions and behavior (Bayanfar et al., 2011). Such curriculum refers to anything students learn through interacting with other students, teachers and other school staff and the general atmosphere of school (Nowrozi Chegini et al., 2017). Students learn HC through non-academic features of school in the classroom. According to Jackson, these learned norms are called HC (Safayi movahhed & Bavafa, 2013). HC includes implied messages of social atmosphere of educational centers which are not written but felt by everyone (Mahbobi et al., 2018).

On the other hand, experts believe that the teacher's ET leads to students' better learning. Researchers have conducted many researches on ET (Asadian et al., 2017). ET depends on the interaction between the student and the teacher (Burroughs et al., 2019), and

the important point is that the teacher should have a series of abilities to have the students learn better (Phillips et al., 2019). In an ET, the teacher is competent in her own field, gets excited for her work and is a good leader (Cao et al., 2019). TE is a function of method, awareness, content knowledge, intentions and human relations (Asadi et al., 2015). In addition to influencing students through behavioral models, HC, and ET, the teachers affect the students through HL. But, playing such a role depends on the HL level of the teachers. HL of teachers includes teachers' ability to access and interpret health services, as well as their competence to use the information and services to improve students' knowledge of health concepts and skills (Ahmadi et al., 2017). The behaviors which enhance the teachers' health can induce healthy behaviors through positive health consequences on students (Bae & Yoon, 2021); as a teacher's expectations of the student determines her educational progress (De Boer et al., 2018), the teacher's HL would also determine student's success in health course; therefore, it can be said that the programs to enhance teachers' HL provide a mechanism to improve teachers' competence and improve the supports required by students (Yamaguchi et al., 2021), and improve the academic variables in them (Ghanizadeh et al., 2021).

Considering HL of a student in terms of her own individual abilities, her AP in health course can have a significant role. The main efficiency criteria of any educational system, especially the education system is the students' success as well as creating positive beliefs and attitudes in them (Doorgarayi et al., 2023). According to recent education theories, the learners must be encouraged to work through necessary training, which not only makes them achieve academic success but also positive attitude, motivation and belief (Sahragard et al., 2022). The main sign of success of an educational system in achieving its goals is the level of its learners' success and includes numerous cognitive, emotional and motivational subsets (Hejazi et al., 2021). In fact, AP means the ability to prove academic success in achieving the goals which are planned for (Tadese et al., 2022).

Therefore, it can be said that high AP acts as a mediation between variables through increasing the students' health awareness, and students can establish regular health patterns by relying on the contents of this course. While reviewing previous studies, some researchers have reported the role of educational interventions in enhancing HL: the studies by Panahi et al. (Panahi et al., 2018) aiming to determine the influence of educational intervention on HL; studies by Vamos et al. (Vamos et al., 2020) on studying the role of education in HL; a study by Bayati et al.) on

investigating the effect of education on HL and its relation to health-promoting behaviors, and Lai et al. (Lai et al., 2018) entitled "HL, teaching beliefs, attitudes, efficacy, and intentions of middle school health and physical education". The importance of health models and its role in school settings in the schools of Australia reflect the effectiveness of interventions and educational variables.

Also, the research conducted by Ahmadi et al. (Ahmadi et al., 2017) on investigating the effectiveness of planning HL curriculum for student-teachers of Teacher Education University to enhance their HL; the studies of Kahtari et al. (Kahtari et al., 2017) on determining the effect of educational intervention on students' HL of Female High Schools; Fallahi and Miri's (Fallahi & Miri, 2017) on determining electronic education effect on the component of HL, have reported similar results.

Considering the issue in this study, the studies on HL level of students show that even the developed countries do not benefit from a suitable level of HL (Velasco et al., 2021) and in some cases, the trend has even been declining (Yang et al., 2021). After studying the meta-analysis of 52 studies, the status of HL in Iran has been reported to be low and borderline (Hoseinzadeh et al., 2021), and it is even low among Iranian students aged 6 to 18 years (Jafari et al., 2021). On the other hand, literacy researchers' interest has shifted from HL among public to HL among professionals of healthcare (Munangatire et al., 2022). Therefore, this study aims to answer whether HL of students could be predicted based on HC, TE and HL of health course teachers through the mediation of AP of health course of 12th grade students.

Material and Methods (Times New Romans, 12 Bold)

The present study aims to structurally analyze students' health literacy based on hidden curriculum, teaching effectiveness, and teachers' health literacy through the mediation of academic performance. Regarding research method, this study uses descriptive-correlational method based on structural equations model. The statistical population includes all 12th grade students (N=6940) of female schools of all 5 educational districts, who have passed health course as well as all of the health course teachers (N=131) who are teaching in these schools. A proportional stratified random method based on 5 districts of Tabriz is used, and in sampling health teachers, the basis of sampling was students and according to the students' school, the school health teacher was included as the sample. In other words, the health teachers are studied according to the schools of the students who were selected randomly.

Accordingly, 100 health teachers are selected according to the students' school. To gather data of AP of health course, the score of the students taken on the final exam is taken into account. To gather the data of other variables the following questionnaires are used:

HL of students and teachers' questionnaire (Tavousi et al., 2016): the questionnaire includes 5 components and 33 items. The components include access, reading skill, understanding, analysis and applying health information. The reliability of this questionnaire in the studies of Tavousi et al. (Tavousi et al., 2016) and Ahmadi et al. (Ahmadi et al., 2017) is reported 0.89 and 0.91, respectively.

HC questionnaire: to measure the level of HC in this study, a researcher-made HC questionnaire is used, which includes 5 components: physical factors, educational, structural, individual and interpersonal factors and behavioral role models, and 52 items. This questionnaire is based on theoretical foundations and background of the studies extracted from 51 curriculum-related articles published. In this regard, using content analysis method, 95 codes were extracted from the articles and were provided to the experts as 95 distinct items. In the next stage, 75 items were approved and given to experts to assess content validity, and 52 item were approved based on content validity ratio (CVR) and content validity index (CVI) and were included in the questionnaire. In the next stage, the questionnaire was handed over to 30 12th-grade students of district 4 of Tabriz to measure its reliability and classify its factors through exploratory factor analysis. Based on the results of factor analysis, 52 items were retained due to their high correlation with the five extractive factors, and the items were divided into 5 factors based on correlational coefficient and logical relation of the item with other items of that factor. In the final stage, the categories were provided to the experts by mentioning the items of each to name the factors. The final group who answered the questionnaires were students. The results of confirmatory factor analysis test show over 0.7 reliability in whole questionnaire and each of the 5 components.

TE questionnaire: To measure the effectiveness level of teaching, a researcher-made questionnaire is used in this study. This questionnaire includes 49 items and measures 8 characteristics of TE technique. The present questionnaire is based on theoretical foundations and research background and is extracted from 44 articles published in the field of teaching and learning. Accordingly, using content analysis, 92 codes were extracted as distinct 92 items from the articles and were handed over to the experts; from which 83 were approved and handed over to the experts to analyze their content validity. Based on

CVR and CVI, 49 items were approved and included in the questionnaire. In the next stage, the questionnaire was handed over to 30 12th- grade students of district 4 of Tabriz to measure its reliability and classify its factors through exploratory factor analysis. Based on the results of factor analysis, 49 items were retained due to their high correlation with the 8 extractive factors, and the items were divided into 8 categories based on correlational coefficient and logical relation of the item with other items of that factor. In the final stage, the factors were provided to the experts by mentioning the items of each to name the factors. The final group who answered the questionnaires were students. The results of confirmatory factor analysis test show over 0.7 reliability in whole questionnaire and each of the 8 components. The scale of all three questionnaires had a five-degree scale with a Likert scale. To analyze the data, partial least squares test is used by applying Smart PLS software. Ethical considerations such as confidentiality, trustworthiness and informed consent have been considered in this study.

Hidden Curriculum

Curriculum planners and educators believe that schools often teach pre-defined goals that are an integral part of school activities besides intentional and guided learning (Jan Alizadeh et al, 2013). Historically, the notion of the hidden curriculum has had a range of definitions. Some scholars referred to the same concept using different names, such as “unstudied” curriculum, the “covert” and “latent” curriculum, “non-academic outcomes of schooling”, “residues of schooling”, and “by-products of schooling” (Raissi Ahvan et al, 2021).

The hidden curriculum exists of values, norms, and beliefs, amongst others, that are not documented or part of the official teaching, but that students are exposed to in the classroom (Uleanya, 2022). A hidden curriculum is a tool that should be utilized in the development of skills and competencies in students—skills and competencies that they need to enter the workforce (Rossouw & Liezel, 2023). The hidden curriculum furthermore aids in the development of social and emotional learning (Maynard et al., 2022). The hidden curriculum, therefore, needs to be conceptualized properly to be understood and harnessed deliberately by lecturers in their teaching, which does not currently seem to be the case. The hidden curriculum can furthermore be used to help students develop over and above the formally taught curriculum so that they can develop into employable graduates and contributing citizens of society (Thielsch, 2017).

The hidden curriculum is highly flexible and contextual, and the definition and enactment of the

hidden curriculum often differ from the time and location that it was enacted (Nahardani et al., 2022).

Nowrouzi et al. pointed out that the hidden curriculum is classically defined as the unwritten, unofficial, and often unintended lessons, values, and perspectives that students learn in school (Nowrouzi et al., 2014). The hidden-curriculum concept is based on the recognition that students absorb lessons in school that may or may not be part of the formal course of study, for example, how they should interact with peers, teachers, and other adults; how they should perceive different races, groups, or classes of people; or what ideas and behaviors are considered acceptable or unacceptable (Rajalakshim & Jayanthi, 2019).

The hidden curriculum has developed extensively in terms of the understanding of the concept. One feature that has become clear is that the hidden curriculum is an irreplaceable component of the curriculum, and a valuable resource in teaching and learning (Hongmei, 2019). The curriculum is therefore an important starting point in the understanding of the hidden curriculum. The curriculum is a determining factor in the student learning experience and social relationships that exist within the learning environment. The student learning experience and social relationships within the classroom are regarded as the conceptual origin of the hidden curriculum (Rossouw & Liezel, 2023).

The best definition that can be given for the hidden curriculum is that this concept is often used to describe the informal school system. This system is not written anywhere and no teacher teaches it. Rather, the educational environment of the school teaches it with all its characteristics. Regardless of how competent the school's teachers are and how advanced the curriculum is, students are exposed to something they were never told about. Over time, under the influence of this informal system, they acquire a special approach to life and a special attitude to education and learning (Morteza et al., 2022).

The hidden curriculum is described as “hidden” because it is usually unacknowledged or unexamined by students, educators, and the wider community. Because the values and lessons reinforced by the hidden curriculum are often the accepted status quo, it may be assumed that these “hidden” practices and messages do not need to change, even if they are contributing to undesirable behaviors and results, whether it is bullying, conflicts, or low graduation and college-enrollment rates. It should be noted that a hidden curriculum can reinforce the lessons of the formal curriculum or contradict the formal curriculum, revealing hypocrisy or inconsistencies between a school's stated mission, values, and convictions and what students experience and learn while they are in

school (Raissi Ahvan et al, 2021). Thus, the hidden curriculum should be considered one of the conceptual capitals of the curriculum course. This concept avoids looking at the curriculum as a superficial phenomenon and considers it at the implementation level with tracking its dynamics.

Teaching Effectiveness

After five decades of research on the effectiveness of teaching, experts believe that effectiveness of teaching is one of the most important factors that ultimately leads to better learning for students. In the last ten years, researchers have done many researches related to effective teaching and have used different words in this case (Asadian et al., 2017). One point of effective and high-quality teaching is that effective teachers work more than the nature of their duties and activities, but their main concern is increasing learning and cultivating logical and critical thinking in students. Effective teaching should be a regular and purposeful activity and its goal is to create favorable conditions for learning and for the teacher and student to influence each other. The important point in this process is that the teacher must have a series of abilities for better learning of the learners (Harris, 2020). The best thing is for the teacher to start with himself, that is, to update his knowledge and skills in relation to his specialized field and to pay special attention to his personality and moral characteristics in a way that he can be the most effective. students and in general, to have in their profession (Bonakdari et al., 2016).

Effectiveness of teaching is one of the important and basic components of education. The effectiveness of learning depends on the interaction between teaching and learning between the student and the teacher (Phillips et al., 2019). One of the most important components of effective teaching is the teacher. Because it has been observed that in effective teaching, teachers are supportive, compassionate, competent in their field, excited for their work, and have good leadership (Cao et al., 2019). Effectiveness of teaching is a function of method, awareness, content knowledge, intentions and relationship. In this view, in order to have a good and effective teaching, it is necessary for the teacher to observe a combination of related indicators (Asadi et al., 2015). The meaning of teaching effectiveness is a set of skills, characteristics and functions of the teacher, which leads to the achievement of the educational and learning goals of the student and finally, the advancement of the main goals of the school (Aminkhandaghi & Seifi, 2013). Effective teaching includes a series of teachers' functions and characteristics, which lead to the achievement of educational goals and the creation of desirable learning in students (Asadi and Gholami,

2016). Effectiveness of teaching is a set of ways to reach students and help them to accumulate knowledge, skills and accepted values. Influence on students' performance by using various factors and classroom processes is another definition of teaching effectiveness (Alijan Nodeh Pashangi et al., 2018). Effectiveness in teaching is defined as a set of capabilities, abilities and interests that lead to the achievement of educational goals in both the teacher and the learner (Ghonji et al., 2015).

Health Literacy

The World Health Organization has recognized health literacy as a key outcome of health education. Recently, the European Health Literacy Project proposed a coherent definition based on a systematic review, which is that health literacy refers to the knowledge, motivation, and adequacy of access to understand, evaluate, and use health-related information in health care, prevention of diseases and health promotion to maintain or improve quality of life throughout the life course (Pendl et al., 2023).

Health literacy is defined as the ability of people to obtain, analyze, and understand basic health information and services that they need in order to be able to participate in their health issues and make the right decisions. In other words, health literacy, the skill and ability of people in line with appropriate decision-making in the field of maintaining and promoting health (De Buhr et al., 2020). But it should be noted that health literacy is a concept beyond the individual abilities of a person. Health literacy is also related to the abilities, tastes, and expectations of providers of information and health care; People like physician, nurses, media, and many other people like parents can influence the health of children and adolescents (Sato et al., 2023).

Health literacy is a broad and complex concept that has been defined in various ways. But there are commonalities in all these concepts that are related to the capacity of people to obtain, process and understand health information and basic services needed for appropriate decisions for health care. In total, several dimensions of health are taken into account and are mixed with health behaviors (Dadaczynski et al., 2020):

The capacity and ability to access information, understand, process and evaluate, make decisions and behave regarding medical and health information, the ability to read, refine and understand health information in order to make a correct judgment, the ability to understand and interpret the meaning of information in written and spoken texts and how to motivate people to pay attention or ignoring health-

related activities, the ability to derive concepts from different forms of communication, using a variety of skills to achieve health-related goals, what is clearly seen in the basis of all definitions is that they all consider health literacy as a set of skills. They know capabilities and capacities in various dimensions, and this is what distinguishes this index from health knowledge. The skills that appear sometimes in the dimension of acquiring and obtaining information, sometimes in the dimension of understanding it, sometimes in the dimension of processing and interpretation, and sometimes in the dimension of decision making and applying information, and these skills are the basis of assessment in health literacy tools (Auld et al., 2020).

Results

Demographic characteristic of health teachers shows that 12 of them (12%) have less than 10 years

of working experience. 18 (18%), 42 (42%), and 28 of these teachers (28%) have 10-15, 15-20 and more than 20 years of working experience, respectively. 70 teachers (70%) hold bachelors' degree. 29 (29%) hold master's degree and 1 holds Ph.D. degree.

Demographic characteristics of the students show that 99 (27.1%), 156 (42.7%), and 110 students (30.1) are studying in the fields of human sciences, experimental sciences and mathematics, respectively.

As shown in Table 1, according to descriptive statistics, all variables are higher than average, except for AP, and the status of AP is average. Since the responses have 5 degrees, to determine the average level, the number of items used in measurement is multiplied by 3 (average of the answers). Considering the lowest passing score of 10 and the highest score of 20, to estimate the average of AP, they were added and divided by two to the final result of 15.

Table 1. Descriptive Statistics of Research Variables and Their Condition Regarding the Average

Variable	Min	Max	Mean \pm SD	Variable status
AP	10	20	15.45 \pm 15.45	average
TE	110	245	204.33 \pm 29.77	Higher than average
HC	55	260	213.22 \pm 31.63	Higher than average
Teacher's HL	42	165	133.91 \pm 16.93	Higher than mean
Student's HL	43	165	121.51 \pm 23.9	Higher than average

The most important stage in statistical analysis of structural equations models is the analysis of data model fit. To fit measurement model, factor loads of each variable is used and as for fitting structural model, the values of significance level of paths and coefficients of determination are used, which have shown the desirability of model fit. Using first and second order confirmatory factor analysis method, the factor loads of 0.4 and higher than that were included in the model, which confirms its being a suitable agent for the related factors.

Cronbach's alpha reliability, composite reliability, convergent validity, and divergent validity have also

been evaluated. Convergent validity has been evaluated using the Fornell and Larcker criteria and according to Table 2, its value was higher than 0.5 in all variables. Divergent validity has been evaluated based on HTMT criteria and according to Table 2, its value was less than 0.9 in all variables. Also, according to Table 2, in all variables, the composite reliability value was greater than the convergent validity value. In general, considering that the fit criteria of the model (Abdali et al., 2022) have been estimated, the model is valid and has sufficient fit in terms of measurement and structure.

Table 2. The fit values of the measurement model and the structural model of the research

Variable	Factor loads	Cronbach's alpha reliability	Composite reliability	Convergent validity (AVE)	Divergent validity (HTMT)
AP	More than 0.4 in all items	1	1	1	0.83
TE		0.89	0.92	0.61	0.76
HC		0.81	0.81	0.58	0.78
Teacher's HL		0.83	0.83	0.56	0.71
Student's HL		0.84	0.87	0.6	0.74

Based on the data in Table 2 and according to the evaluation criteria of the model fit, because the coefficient of determination (R^2) is equal to 0.724 and higher than 0.67 in the model for predicting the students' HL, it indicates a higher-than-average relationship and a good fit structural model. Also, based on the goodness-of-fit (GOF) index, it can be said that considering that in predicting the students' HL, this index is equal to 0.47 and higher than 0.36, the model has a high goodness of fit, and based on this,

the presented general model is valid. According to Table 2, other indices also show a high fit of the structural equation model.

Research hypothesis test with PLS software at significance level of 0.05 shows that students' HL can be explained based on HC, TE, and teachers' HL through the mediation of AP of health course taken by 12th grade students of Female high schools of 5 educational districts of Tabriz.

Table 2: Goodness-of-fit index results of the confirmed model

Fit Index	Value	Acceptable Fit	Good Fit
R^2	0.724	$0.67 \leq R^2 \leq 0.33$	$0.99 \leq R^2 \leq 0.67$
GOF	0.47	$0.36 \leq GOF \leq 0.25$	$0.99 \leq GOF \leq 0.36$
NFI	0.955	$0.90 \leq NFI < 0.95$	$0.95 \leq NFI \leq 1.00$
SRMR	0.03	$0.05 \leq SRMR \leq 0.08$	$0 \leq SRMR < 0.05$

According to fig 1, the structural part of equation model indicates that teachers' HL variable with a direct effect of 0.51 plays the most role in explaining the students' HL; TE of health course with a direct effect of 0.47 and HC with a direct effect of 0.41 play a role in explaining students' HL decline. Corrected coefficient of determination with value of 0.72 indicates the capability of predicting students' HL variable based on predicting HC, TE, and teachers' HL

through the mediation of AP at higher than average (higher than 0.67). At the same time, according to the structural equation model presented, HC, TE, and teachers' HL with value of corrected coefficient of determination of 0.49 is capable of explaining AP at average (within the range of 0.33 to 0.67). TE with a direct effect of 0.56 and teachers' HL with path coefficient of 0.12 have the most and least influence, respectively.

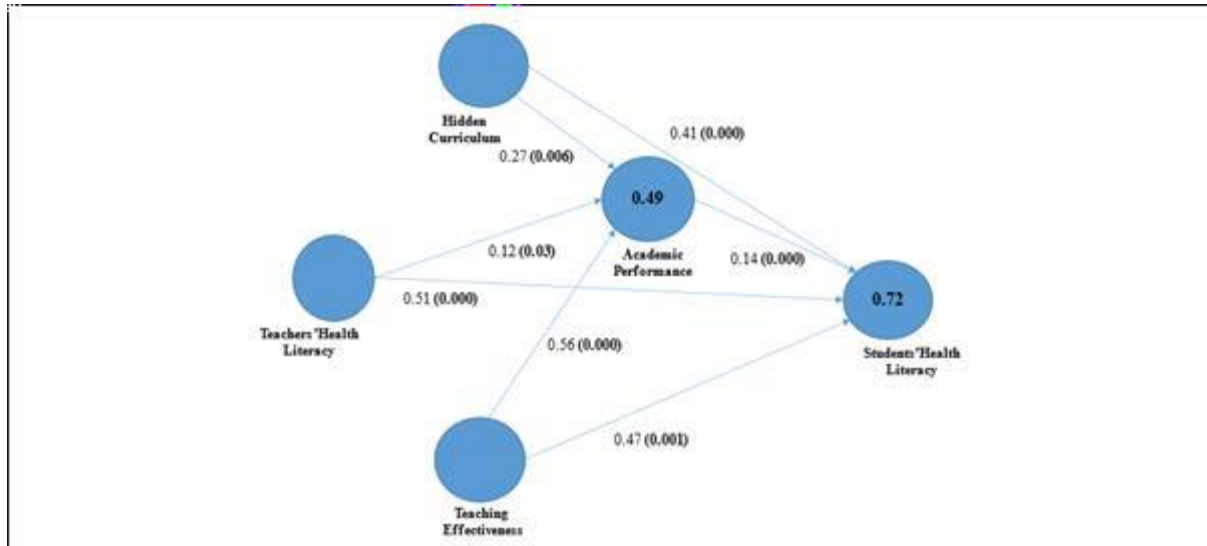


Fig 1. Values of Path coefficient, Significance Level and Determination Coefficient of Structural Equation Model of Predicting Students' HL Based on HC, TE, and Teachers' HL Through the Mediation of AP

According to fig 1, significance level of all paths is less than 0.05. Therefore, the direct effect of HC, TE, teachers' HL and AP on students' HL and direct effect of HC, TE, and teachers' HL on students' AP in health course at the significance level of lower than 0.05 is confirmed.

According to the data of table 3, indirect effect indicates that AP in health course play a mediating role among HC, TE and teacher's HL and students' HL and these effects are at a significance level of lower than 0.05.

Table 3. Indirect Effect of HC, TE, Teachers' HL Through the Mediation of AP on Students' HL

Path	Path coefficient	P
Teacher's HL -> AP -> student's HL	0.16	0.006
HC -> AP -> student's HL	0.07	0.041
TE -> AP -> student's HL	0.29	0.000

Discussion

According to the research results, students' HI based on TE of health course, HC, health teachers' HL is predictable through the mediation of students' AP in health course.

HL is one of the key factors of enhancing health of an individual and society, which it is itself a function of human and social environment (Jafari et al., 2021) and content and tendency to health education (Cheng et al., 2020). According to Lai et al. to improve HL of students, school and educational authorities must pay attention to critical factors and intentions of health teachers (Lai et al., 2018). Vamos et al. consider health education of teachers as the basis of developing health education of students (Vamos et al., 2020). Schmidt et

al. report that society and school-oriented interventions are effective in enhancing students' HL (Schmidt et al., 2023). Taba et al. reported significant relation between self-efficacy and successful performance and HL (Taba et al., 2022).

According to Brick et al. educational effectiveness of HL of teacher improves their teaching, reduces the use of verbal and corporal punishment and increases positive reward systems such as social and emotional support of students through making good relations (Brick et al., 2021). Kirchhoff et al. reported similar results (Kirchhoff et al., 2022). Nevertheless, these results are not consistent with the findings of Otten et al. where little evidence is found to prove that education effectiveness of HL of teachers leads to

teachers' behavioral change toward students (Otten et al., 2022).

According to social learning theory, while reviewing HL formation in individuals from cognitive, attitude and performance points of view, it can be said that: throughout life from childhood and at home, most of the parents' and others' behaviors form main part of our health awareness and behaviors and these awareness and health performances could continue to our teenage and other periods of life or could deteriorate. Therefore, at school ages, besides other social factors, the role of school environment and the ways of spending educational hours in school could determine the continuation or decline of previous health related-knowledge of the students. HC is the main part of such factors that can influence HL of students via continuous interaction of students with physical environment of school, when facing with school rules and disciplinary structure, interaction with students and teachers and even other individuals' interaction with each other and the quality of classrooms. TE is another determining factor, especially in health course, that can guarantee learning in various cognitive, emotional and psychomotor domains and can play a key role to enhance HL which is of the main goal of this course at 12th grade. In this regard, self-efficacy of health teachers as a main part of HC and as a key factor of school health plays a key role in enhancing HL of students and their individual and social behaviors and the way of conducting their duties regarding school health.

To better control the sample, the present study limits the samples to 12th grade students and to measure the research variables, the questionnaires are used. Therefore, it is suggested that future studies be carried out on this subject using qualitative method and interview.

Conflict of interest: There are no conflicts of interest.

Financial sponsor: There is no financial support.

Acknowledgements: This article is taken from the Ph.D. thesis in the Islamic Azad University of Tabriz branch, which was researched in secondary schools of Tabriz city, and we thank of the school principals, teachers and students who cooperated in collecting research data.

References

Abdali E, Talebi B, Khadivi A. (2022) Validation of Rosenberg Teachers' Occupational Stress Scale on

Iranian Teachers. *J Occup Health Epidemiol*, 11 (4) :281-290

Ahmadi F Z, Mehr-Mohammadi Mahmoud , Vala Jean , & Montazeri Ali (2017). Developing a health literacy curriculum for pre-service teachers using a Dialogue Education Approach: A normative inquiry. *Payesh (Health Monitor) Journal*, 16(3), 367-381. <http://payeshjournal.ir/article-1-110-en.html>

Ahmazadeh sani, t., Vahedian-Shahroodi, M., Tehrani, H., & Esmaily, H. (2019). Relationship between health literacy and nutrition among middle-aged women. *Journal of Health Literacy*, 3(4), 9-15. <https://doi.org/10.22038/jhl.2019.36772.1019>

Alijan Nodeh Pashangi, Majid, Behrangi, Mohammad Reza, Abdollahi, Bijan, and Hassan Reza Zeinabadi. (2018) "Elements of the Effectiveness of Classroom Leadership Teaching and Learning in Secondary Schools." *Journal of Research in School and Virtual Learning* 6, no. 2 , 65-80 (Persian).

Ameri, F., Dastani, M., Sabahi, A., Hooshangi, F., Rahimkarimi, M., Rajabi, E., & Yaghooby, P. (2022). The Role of E-Health Literacy in Preventive Behaviors for COVID-19: A Systematic Review. *Journal of Health Literacy*, 6(4), 88-97. <https://doi.org/10.22038/jhl.2021.61581.1241>

Aminkhandaghi, Maghsoud & Seifi Gholamali. (2013) "Effective Skills and Skills Required for University Teaching." *Research and Planning in Higher Education* 19th Year, no. 3, 121-47 (Persian).

Asadi, M. G., Khalil, & Bolandhematan, K. (2015). Fundamental Factors and Components of Effective Teaching in Higher Education from the Perspective of Students and Faculty Members of Kurdistan University. *Modern Educational Thoughts*, 11(1), 123-149. (Persian).

Asadi, Mohammad and Gholami, Khalil. (2016) "Synthesis of research on the model of effective teaching in higher education." *Educational Planning Studies* 5, no. 9 , 113-44 (Persian).

Asadian, s., Piri, M., & SaadatFar, R. (2017). Effective Teaching in Higher Education Based on Professional Experiences of Professors and Its Relationship with Self-Reported Teaching. *Journal of higher education curriculum studies*, 8(15), 113-134. (Persian).

http://www.icsajournal.ir/article_53545_ebbb08904_ea2c976d749c31d97cd7bc4.pdf

Auld, M. E., Allen, M. P., Hampton, C., Montes, J. H., Sherry, C., Mickalide, A. D., Logan, R. A., Alvarado-Little, W., & Parson, K. (2020). Health Literacy and Health Education in Schools: Collaboration for Action. *NAM perspectives, 2020*, 10.31478/202007b. <https://doi.org/10.31478/202007b>

Bae, E. J., & Yoon, J. Y. (2021). Health Literacy as a Major Contributor to Health-Promoting Behaviors among Korean Teachers. *Int J Environ Res Public Health*, 18(6). <https://doi.org/10.3390/ijerph18063304>

Bayanfar, F., Maleki, H., Dlavar, A., & Saif, A.-A. (2011). A study on the probable impact of junior high school hidden curriculum on student achievement: Presenting an efficient model. *Educational Innovations*, 10(1), 71-100. http://noavaryedu.oerp.ir/article_78940_1ac6a299b96d9518af39eafbc07850b.pdf

Bayati, T., Dehghan, A., Bonyadi, F., & Bazrafkan, L. (2018). Investigating the effect of education on health literacy and its relation to health-promoting behaviors in health center. *J Educ Health Promot*, 7, 127. https://doi.org/10.4103/jehp.jehp_65_18

Bonakdari, Nasrin, Mehran, Golnar, Mahroozadeh, Tayebeh and Seyed Abbas Hashemi. (2016) "Characteristics of Competent Teachers in Iranian Higher Education: A Qualitative Study." *New Approach in Educational Management* 7, no. 27, 117-38 (Persian).

Brick, K., Cooper, J. L., Mason, L., Faeflen, S., Monmia, J., & Dubinsky, J. M. (2021). Training-of-Trainers Neuroscience and Mental Health Teacher Education in Liberia Improves Self-Reported Support for Students [Original Research]. *Frontiers in Human Neuroscience*, 15. <https://doi.org/10.3389/fnhum.2021.653069>

Burroughs, N., Gardner, J., Lee, Y., Guo, S., Touitou, I., Jansen, K., & Schmidt, W. (2019). A Review of the Literature on Teacher Effectiveness and Student Outcomes. In N. Burroughs, J. Gardner, Y. Lee, S. Guo, I. Touitou, K. Jansen, & W. Schmidt (Eds.), *Teaching for Excellence and Equity: Analyzing Teacher Characteristics, Behaviors and Student Outcomes with TIMSS* (pp. 7-17). Springer International Publishing. https://doi.org/10.1007/978-3-030-16151-4_2

Cao, Y., Postareff, L., Lindblom-Ylänne, S., & Toom, A. (2019). Teacher educators' approaches to teaching

and connections with their perceptions of the closeness of their research and teaching. *Teaching and Teacher Education*, 85, 125-136. <https://doi.org/https://doi.org/10.1016/j.tate.2019.06.013>

Charoghchian Khorasani, E., Jafari, A., Mahdiadeh, M., Tehrani, H., Moghzi, M., & Peyman, N. (2023). Designing a model of health literacy organization in health care centers in Iran. *Journal of Health Literacy*, 7(4), 44-59. <https://doi.org/10.22038/jhl.2021.60603.1214>

Cheng, C., Beauchamp, A., Elsworth, G. R., & Osborne, R. H. (2020). Applying the Electronic Health Literacy Lens: Systematic Review of Electronic Health Interventions Targeted at Socially Disadvantaged Groups. *J Med Internet Res*, 22(8), e18476. <https://doi.org/10.2196/18476>

Dadaczynski, K., Rathmann, K., Hering, T., & Okan, O. (2020). The Role of School Leaders' Health Literacy for the Implementation of Health Promoting Schools. *International Journal of Environmental Research and Public Health*, 17(6), 1855. doi:10.3390/ijerph17061855

De Boer, H., Timmermans, A. C., & van der Werf, M. P. C. (2018). The effects of teacher expectation interventions on teachers' expectations and student achievement: narrative review and meta-analysis. *Educational Research and Evaluation*, 24(3-5), 180-200. <https://doi.org/10.1080/13803611.2018.1550834>

De Buhr, E., Ewers, M., & Tannen, A. (2020). Potentials of School Nursing for Strengthening the Health Literacy of Children, Parents and Teachers. *International journal of environmental research and public health*, 17(7), 2577. <https://doi.org/10.3390/ijerph17072577>

Doorgarayi, P., Saberi, R., & Manzari Tavakoli, V. (2023). The mediating role of attention control, emotional regulation and cognitive flexibility in the relationship between mindfulness and academic achievement in students. *Thinking and Children*, 13(2), -. <https://doi.org/10.30465/fabak.2023.7768>

Fallahi, T., & Miri, M. (2017). The Effects of E-Learning Based on the Dimensions of Health Literacy in Patients with Ischemic Heart Disease [Research]. *nursing development in health*, 8(1), 29-36. <http://ndhj.lums.ac.ir/article-1-151-fa.html>

Ghanizadeh, D., Talebi, B., & Yazdani, S. (2021). Students' Academic Buoyancy Prediction based on Health Literacy and Performance of School Health Nurses. *International Journal of School Health*, 8(1), 23-30.

<https://doi.org/10.30476/intjsh.2020.88382.1112>

Ghonji M, Khoshnodifar Z, Hosseini SM, Mazlounzadeh SM. (2015) Analysis of the some effective teaching quality factors within faculty members of agricultural and natural resources colleges in Tehran University. *Journal of the Saudi Society of Agricultural Sciences*. 14(2):109-15.

Harris J. (2020) If you can't do teach: Exploring short-termism in the teaching profession. *International Journal of Educational Research*. 99:101519.

Hejazi, E., Narenji thani, F., & Ghofrani, A. (2021). Psychological Components Related to Students Success in a Blended Learning Environment. *Journal of Applied Psychological Research*, 12(3), 105-127. <https://doi.org/10.22059/japr.2021.326666.643902>

Hongmei, L. (2019). The significance and development approaches of hidden curriculum in college English teaching. *Advances in Social Science, Education and Humanities Research*, 286, 262-265.

Hoseinzadeh, E., Tavakoli, N., & Safari, M. (2021). Health Literacy and its related factors among adults referring to healthcare centers of Saveh city, Iran [Research]. *Zanko Journal of Medical Sciences*, 21(71), 69-78. <http://zanko.muk.ac.ir/article-1-546-en.html>

Hosseinkhani, N., & Talebi, B. (2020). The Role of School Health Nurses' Health Literacy in their Quality of Life in Health-Promoting Schools [Research]. *Health-Based Research*, 5(4), 369-382. <https://doi.org/10.22062/5.4.369>

Jafari, A., Tavakoly Sany, S. B., & Peyman, N. (2021). The Status of Health Literacy in Students Aged 6 to 18 Old Years: A Systematic Review Study. *Iranian Journal of Public Health*, 50(3). <https://doi.org/10.18502/ijph.v50i3.5584>

Janalizadeh H, Sharepour M, Kashefi Rad R. (2013) The role of hidden curriculum on educational function of students (a case study in Neyshabour high-school students). *Journal of Sociological Studies of Youth*. 4(8):59-82. (Persian)

Kahtari, M., Farmanbar, R., Kasmaei, P., & Omid, S. (2017). The effect of the educational intervention on health literacy level in the girl students. *Journal of Health Literacy*, 2(3), 187-197. <https://doi.org/10.22038/jhl.2017.10939>

Kirchhoff, S., Dadaczynski, K., Pelikan, J. M., Zelinka-Roitner, I., Dietscher, C., Bittlingmayer, U. H., & Okan, O. (2022). Organizational Health Literacy in Schools: Concept Development for Health-Literate Schools. *International Journal of Environmental Research and Public Health*, 19(14), 8795. <https://www.mdpi.com/1660-4601/19/14/8795>

Lai, H. R., Wu, D. M., Lee, P. H., & Jhang, Y. S. (2018). Health Literacy Teaching Beliefs, Attitudes, Efficacy, and Intentions of Middle School Health and Physical Education Teachers. *J Sch Health*, 88(5), 350-358. <https://doi.org/10.1111/josh.12615>

Mahbobi, T., Karimi, S., & Mahbobi, K. (2018). Examining the relationship between hidden curriculum, motivational beliefs, and entrepreneurship of students in Payame Noor University. *Research in School and Virtual Learning*, 5(3), 101-109. https://etl.journals.pnu.ac.ir/article_4502_4440eef73395890d0f5a6457dbedd001.pdf

Maynard, E., Warhurst, A., & Fairchild, N. (2022). Covid-19 and the lost hidden curriculum: Locating an evolving narrative ecology of schools-in-Covid. *Pastoral Care in Education*, 1-21. <https://doi.org/10.1080/02643944.2022.2093953>

Moghaddam Hosseini, S., & Talebi, B. (2018). A Partial Least Squares Path Model of Principals' Performance in School Health Services Based on Spiritual Intelligence in Tabriz Female High Schools. *International Journal of School Health*, 5(3), 1-8. <https://doi.org/10.5812/intjsh.77217>

Moharramzadeh, A., Talebi, B., & Daneshvar, Z. (2022). Health Literacy Strategies for Human Resources (Qualitative Study in Iranian Bank) [Qualitative Research]. *Bimonthly of Education Strategies in Medical Sciences*, 15(4), 319-329. <http://edcbmj.ir/article-1-2283-fa.html>

Morteza, A., Talebi, B., & Adib, Y. (2022). Design and validation of students' hidden curriculum of University of Science Urmia. *Educational Development of Judishapur*, 13(1), 74-85. (Persian). doi: 10.22118/edc.2021.275117.1732

Munangatare, T., Tomas, N., & Mareka, V. (2022). Nursing students' understanding of health literacy and health practices: a cross-sectional study at a university in Namibia. *BMC Nurs*, 21(1), 8. <https://doi.org/10.1186/s12912-021-00776-z>

Nahardani, S. Z., Rastgou Salami, M., Hasan Keshavarzi, M., & Mirmoghtadaie, Z. (2022). The hidden curriculum in online education is based on systematized review. *Shiraz E Medical Journal*, 23(4). <https://doi.org/10.5812/semj.105445>

Nowrozi Chegini, B., Sheikhi Feniqi, A. A., Osareh, A., & Zarei, I. (2017). Explaining the effect of hidden curriculum on the sense of belonging to school of elementary school students. *Research in Teaching*, 4(3), 21-46.

Nowrouzi R, Jannat ferey dooni T, Mashakalayeh M. (2014) The study of the relationship between the hidden curriculum components and the national identity of high school students, *Research in Curriculum Planning*. 2014; 11(42):110-21. (Persian)

Otten, C., Nash, R., & Patterson, K. (2022). HealthLit4Kids: teacher experiences of health literacy professional development in an Australian primary school setting. *Health Promotion International*. <https://doi.org/10.1093/heapro/daac053>

Panahi, R., Ramezankhani, A., Tavousi, M., Osmani, F., Karami, A., & Niknami, S. (2018). Effect of educational intervention on health literacy and adoption of smoking preventive behaviors among university students. *Journal of Education and Community Health*, 5(2), 26-35.

Pendl, D., Maitz, K. M., & Gasteiger-Klicpera, B. (2023). Examining the relationship between health literacy and individual and sociodemographic factors in secondary school students. *Journal of Public Health*. <https://doi.org/10.1007/s10389-023-01836-1>

Phillips, K. F., Mathew, L., Aktan, N., & Sandanapitchai, P. (2019). The effectiveness of shared clinical teaching in nursing. *Int J Nurs Sci*, 6(2), 211-215. <https://doi.org/10.1016/j.ijnss.2019.03.002>

Rajabi, E., Dastani, M., Hadi Tavallae, N., Taghizadeh, N., Jalali, Z., & Ameri, F. (2023). Effect of E-Health Literacy on Mental Health of People During the COVID-19 Pandemic: A Systematic Review [Review]. *Journal of Modern Medical Information*

Sciences, 8(4), 396-407. <https://doi.org/10.32598/jmis.8.4.9>

Rajalakshim R, Jayanthi CE. (2019) Gender school and society. United States: Lulu Publication.

Raissi Ahvan Y, Shaykhei Fini AA, Zainalipour H. Effectiveness of the Hidden Curriculum on Affective Attitudes of High School Students Toward Learning. *Journal of Research & Health*. 2021; 11(6):423-434. <http://dx.doi.org/10.32598/JRH.11.6.1925.1>

Rossouw Nina & Liezel Frick (2023) A conceptual framework for uncovering the hidden curriculum in private higher education, *Cogent Education*, 10:1, DOI: [10.1080/2331186X.2023.2191409](https://doi.org/10.1080/2331186X.2023.2191409)

Safaei Movahed S. (2013) Towards another meta-theory for understanding the hidden curriculum. *Research in Curriculum Planning*. 10(37):75-95. (Persian)

Safayi movahhed, S., & Bavafa, D. (2013). Factors shaping the hidden curriculum in Iran's higher education: a self-mapping ethnography. *Journal of higher education curriculum studies*, 3(7), 30-53.

Sahragard, S., Haroon Rshidi, H., & Kazemianmoghadam, K. (2022). The Effectiveness of Positive Intervention on Motivational Beliefs of Students with Academic Failure. *Positive Psychology Research*, 8(2), 51-64. <https://doi.org/10.22108/ppls.2022.130539.2183>

Sato, Y., Suzuki, R., Shigihara, M., & Suzuki, C. (2023). The effect of guardians' health literacy on the child's spending time at home: A cross-sectional study among Japanese schoolchildren. *AIMS public health*, 10(1), 52-62. <https://doi.org/10.3934/publichealth.2023005>

Schmidt, T. J., Sellin, J., Molderings, G. J., Conrad, R., & Mücke, M. (2023). Correction : Health-related quality of life and health literacy in patients with systemic mastocytosis and mast cell activation syndrome. *Orphanet Journal of Rare Diseases*, 18(1), 29. <https://doi.org/10.1186/s13023-023-02645-1>

Schulenkorf, T., Krah, V., Dadaczynski, K., & Okan, O. (2021). Addressing Health Literacy in Schools in Germany: Concept Analysis of the Mandatory Digital and Media Literacy School Curriculum. *Front Public Health*, 9, 687389. <https://doi.org/10.3389/fpubh.2021.687389>

Silva, M. J., & Santos, P. (2021). The Impact of Health Literacy on Knowledge and Attitudes towards Preventive Strategies against COVID-19: A Cross-Sectional Study. *Int J Environ Res Public Health*, 18(10). <https://doi.org/10.3390/ijerph18105421>

Taba, M., Allen, T. B., Caldwell, P. H. Y., Skinner, S. R., Kang, M., McCaffery, K., & Scott, K. M. (2022). Adolescents' self-efficacy and digital health literacy: a cross-sectional mixed methods study. *BMC Public Health*, 22(1), 1223. <https://doi.org/10.1186/s12889-022-13599-7>

Tadese, M., Yeshaneh, A., & Mulu, G. B. (2022). Determinants of good academic performance among university students in Ethiopia: a cross-sectional study. *BMC Medical Education*, 22(1), 395. <https://doi.org/10.1186/s12909-022-03461-0>

Tavousi Mahmoud , Haeri Mehrizi Aliasghar, Rafiefar shahram , Solimani Atoosa , Sarbandi Fateme , Ardestani Mona , Hashemi Akram , & Montazeri Ali (2016). Health literacy in Iran: findings from a national study [Descriptive]. *Payesh (Health Monitor) Journal*, 15(1), 95-102. <http://payeshjournal.ir/article-1-199-fa.html>

Thielsch, A. (2017). Approaching the invisible: Hidden curriculum and implicit expectations in higher education. *Journal for Higher Education Development*, 12(4), 167-187. <https://doi.org/10.3217/zfhe.12-04/11>

Uleanya, C. (2022). Hidden curriculum versus transition from onsite to online: A review following

COVID-19 pandemic outbreak. *Cogent Education*, 9(1). <https://doi.org/10.1080/2331186X.2022.2090102>

Vamos, S., Okan, O., Sentell, T., & Rootman, I. (2020). Making a Case for "Education for Health Literacy": An International Perspective. *Int J Environ Res Public Health*, 17(4). <https://doi.org/10.3390/ijerph17041436>

Velasco, V., Gragnano, A., Lombardia, G. R. H., & Vecchio, L. P. (2021). Health Literacy Levels among Italian Students: Monitoring and Promotion at School. *International Journal of Environmental Research and Public Health*, 18(19), 9943. <https://www.mdpi.com/1660-4601/18/19/9943>

Wosu, U. N. (2023). Brainstorming, Field Trip and Gender Effects On Junior Secondary School Students' Attitude to Business Studies in Rivers State, Nigeria. *British Journal of Education*, 11(3), 25-37.

Yamaguchi, S., Foo, J. C., Kitagawa, Y., Togo, F., & Sasaki, T. (2021). A survey of mental health literacy in Japanese high school teachers. *BMC Psychiatry*, 21(1), 478. <https://doi.org/10.1186/s12888-021-03481-y>

Yang, P., Ou, Y., Yang, H., Pei, X., Li, J., Wang, Y., Tan, F., Zhao, X., & Liu, W. (2021). Research on Influencing Factors and Dimensions of Health Literacy in Different Age Groups: Before and After the COVID-19 Era in Chongqing, China. *Front Public Health*, 9, 690525. <https://doi.org/10.3389/fpubh.2021.690525>

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