Eating an enjoyable and balanced diet

Food literacy among older adults

Felix Zastrow, Katrin Neher, Carola Pentner, Holger Hassel

Abstract

The term food literacy is used to describe people's ability to meet the complex requirements of a balanced diet. To date, there has been little research into the relationships between food literacy in older adults, their health literacy and their dietary behavior. These three aspects are the subject of a study on the promotion of food literacy in older adults. The baseline data of 119 study participants were used for this analysis. Daily fruit and vegetable consumption and daily fluid intake were used as a proxy for dietary behavior. The food literacy score according to Poelman et al. (2018) of 97 participants (mean age: 72.2 years) exhibits a positive association with their health literacy according to Sørensen et al. (2015). However, discrepancies in sociodemographic factors suggest that food literacy and health literacy cannot be assessed in the same way.

Keywords: food literacy, dietary behavior, health literacy, older adults

Introduction

Given that nutrition is central to healthy aging and the prevention of chronic diseases, understanding how dietary behavior is shaped is crucial. Food literacy is the ability to organize everyday eating and nutrition in an autonomous, responsible and enjoyable way that supports balanced dietary behavior [1–5]. However, the definition of food literacy differs in terms of what particular aspects—what factual and practical nutritional knowledge and what habits and skills—actually contribute to a balanced diet, and in terms of how these abilities and skills should be measured [6–12]. It appears that *practical* food literacy (for example knowing how to prepare a balanced meal), is more important in shaping dietary behavior than *factual* food literacy (for example knowing that pasta is high in carbohydrates) [13].

According to the model proposed by Vidgen and Gallegos [10], food literacy is composed of four core skills:

1. Planning and management
2. Selection
3. Preparation
4. Eating

Poelman et al. [6] developed an instrument based on these skills to measure food literacy in adults. To do this, they created a scale with eight domains designed to cover the spectrum of food literacy (▮▮▮▶ methods section).

From a scientific point of view, food literacy is a specific form of health literacy [4]. The fact that food literacy is closely linked to the comprehensive concept of health literacy is also reflected by the measurement instruments used for food literacy [7, 8], since these are based on health literacy models—especially those proposed by Nutbeam [14] and Sørensen et al. [15].

> **According to the conceptual model of the European Health Literacy Survey (HLS-EU), "health literacy entails people's knowledge, motivation and competences to access,**

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> **understand, appraise, and apply health information in order to make judgments and take decisions in everyday life concerning healthcare, disease prevention and health promotion to maintain or improve quality of life during the life course" (wording from [15]).**

Health literacy levels are key determinants of healthy aging and the prevention of chronic diseases. In Germany, the older adult age group (aged 65 years or over) in particular exhibits limited health literacy [16, 17].

The same is true for food literacy. According to a representative national study conducted in Germany, 42.5% of people in the 60 to 69 year-old age group have an inadequate or problematic level of food literacy [18]. Furthermore, the nutritional situation among older adults in Germany is very heterogeneous. The percentage of adults aged 65 years or over who are overweight or obese is particularly problematic [19]. In addition, age can come with some specific challenges, such lacking a sensation of thirst [20]. In addition to overweight and obesity, other diseases have also been described as consequences of an unbalanced diet. These include coronary heart disease and cancer [21, 22].

Studies have shown that both health literacy and food literacy influence dietary behavior [7, 16, 23]. This article aims to investigate the association between food literacy and health literacy and the dietary behavior of older adults.

Study question and initial hypotheses

This article therefore aims to answer the following question: Is there a statistical association between the food literacy of the participating older adults and their health literacy and dietary behavior? Furthermore, this article will investigate whether differences in the food literacy of the respondents depend on their age, their highest completed level of education, or the presence of one or more chronic diseases.

Based on the conceptual considerations presented in the introduction, it was expected that there would be a positive association between food literacy and the overarching concept of health literacy [24]. It was also expected that food literacy would be higher among women and that it would be linked to a higher level of educational attainment [7, 25, 26]. Furthermore, it was assumed that lower food literacy would be associated with the presence of chronic diseases [16].

In addition, the daily fruit and vegetable consumption and daily fluid intake of the older adult participants were analyzed. The current German Nutrition Society recommendations in this regard are 5 portions of fruit and vegetables a day and a fluid intake of 1.5 liters per day [27]. It was assumed that those with a higher fruit and vegetable consumption would have a higher level of food literacy [6, 7]. Moreover, it was determined whether there was a difference in food literacy between participants who achieved the recommended daily fluid intake and those who did not.

Methodology

Data collection in the "GUSTO" project

The project *"Gemeinsam gesund älter werden mit Genuss – Förderung der Ernährungskompetenz älterer Menschen in der Kommune"* ("Enjoy Eating and Stay Healthy Together - Promoting Food Literacy in Older Adults in the Community") ("GUSTO") is funded by the *Gesund. Leben.Bayern.* initiative of the Bavarian State Ministry of Health and Care and aims to optimize health literacy and especially food literacy among people aged 65 and over who live independently. For this project, 136 people were recruited and 11 groups were set up by the local authority project partners in 11 participating Bavarian institutions. The intervention consists of a community group program for groups of older people working independently with the help of peer facilitators (for more information, see: [28], a publication on the development of the intervention is currently being prepared).

In the "GUSTO" project, participants complete a written questionnaire that uses a quasi-experimental evaluation design with a pre-post comparison. The results presented here refer to the questionnaire at the beginning of the intervention.

Food literacy To measure food literacy, a version of the self-perceived food literacy scale (SPFL scale) that was translated into German [6] was used. This same measurement had previously been used in a representative study investigating food literacy in Germany [18]. The participating older adults were asked about a broad spectrum of aspects with 29 questionnaire items in total (a five-level scale was used, ranging from "not at all/never" to "yes/always"; original questionnaire: Overview 1, last page). The questions were about the following eight topics (in accordance with [6]):

1. Food preparation skills
2. Resilience and resistance
3. Healthy snack styles
4. Social and conscious eating
5. Examining food labels
6. Daily food planning
7. Healthy budgeting
8. Healthy food stockpiling

The food literacy score was calculated from the mean value of the 29 responses given by the respondents. The scoring was from 1 to 5, with 5 being the best possible food literacy score. The food literacy score was divided into four categories: inadequate (1.00 to 2.49 points), prob-

lematic (2.50 to 3.49 points), adequate (3.50 to 4.49 points) and excellent (4.50 to 5.00 points) (see [18]).

Health literacy To measure health literacy, an abridged German version of the measurement instrument that was developed for the European Health Literacy Survey (HLS-EU-Q) [29] with 16 questions was used (see [30, 31]). In the HLS-EU-Q16, participants were asked about how difficult they feel it is to cope with 16 tasks or activities that are relevant to health. The participants estimated how easy or difficult they felt it was for them to perform each task or activity (using a four-category Likert scale ranging from "very easy" to "very difficult"). Based on the responses, an index with values from 0 (very low health literacy) to 50 (very high health literacy) was created. Threshold values were also defined for the index, creating four different health literacy levels, analogous to the method used for food literacy [15, 29, 31, 32].

Dietary behavior The questionnaire about dietary behavior focused on two key food groups as proxies for dietary behavior. This was done to limit the length of the questionnaire so that it did not become too long for the participants.

Data was collected on the average consumption of the following foodstuffs in the previous four weeks: 1) fruit and vegetables or salads and 2) all drinks except for milk. A significantly abridged and modified version of a consumption frequency questionnaire [33] with three items was used for this. The German Nutrition Society dietary recommendations for fruit and vegetable consumption and fluid intake were used as the target values [27].

Sociodemographic and other characteristics

The following variables were recorded: age, sex, immigrant background, highest completed level of education, and type and number of chronic diseases from a list of chronic diseases (self-reported).

	Participants	Group leaders
Sample size n = 119	97 (81.5%)	22 (18.5 %)
Age (± SD)	72.2 (6.8)	67.1 (4.0)
Sex		
Female	70 (72.2 %)	14 (63.6 %)
Male	27 (27.8 %)	8 (36.4 %)
Immigrant background	6 (6.2 %)	2 (9.1 %)
Highest completed level of education		
Lower secondary level school leaving certificate *(Haupt-/Volksschulabschluss)*	37 (38.1 %)	4 (18.2 %)
Intermediate level secondary school leaving certificate *(Realschulabschluss)*	37 (38.1 %)	3 (13.6 %)
School leaving certificate allowing access to university studies *([Fach-]Hochschulreife*)	9 (9.3 %)	5 (22.7 %)
University degree	12 (12.4 %)	10 (45.5 %)
Chronically ill	61 (62.9 %)	15 (68.2 %)
Health literacy		
Inadequate	8 (8.2 %)	1 (4.5 %)
Problematic	28 (28.9 %)	6 (27.3 %)
Adequate	41 (42.3 %)	10 (45.5 %)
Excellent	17 (17.5 %)	4 (18.2 %)
Daily fruit and vegetable consumption		
≤ 2 portions	21 (21.6 %)	2 (10.0 %)
3 portions	16 (16.5 %)	2 (10.0 %)
4 portions	16 (16.5 %)	8 (36.4 %)
≥ 5 portions **(recommended intake achieved)**	37 (38.1 %)	8 (36.4 %)
Recommended daily fluid intake achieved	55 (56.7 %)	16 (72.7 %)

Table 1: **Characteristics of participants and group leaders**
SD = standard deviation

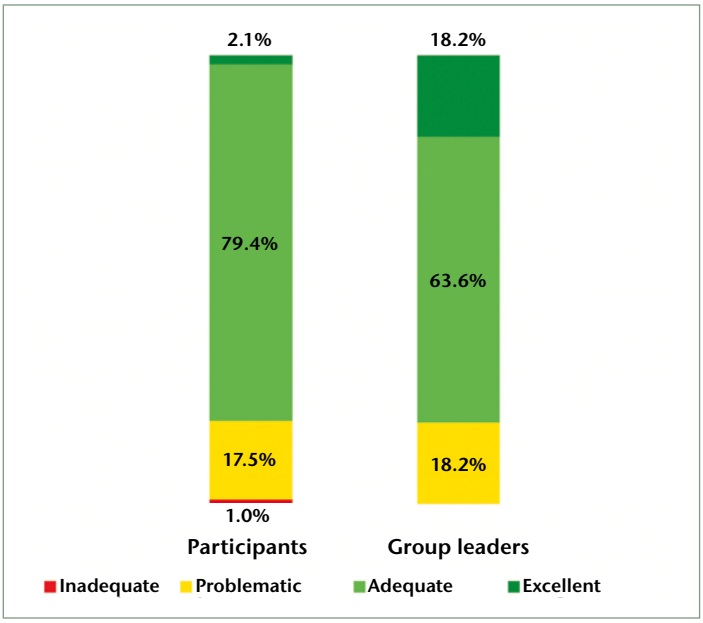


Fig. 1: **Distribution of the food literacy scores of participants and group leaders by category**

Statistical evaluation

The group leaders were given training on what their role as peer facilitators involved. For this reason, the group leaders and other participants have been evaluated separately.

The data were evaluated using IBM SPSS Statistics 26. Individual missing values were accepted and not replaced. First, the normal distribution of the participants' food literacy scores was tested using a Shapiro-Wilk test. Since there was no normal distribution, Spearman's rank correlation for metrically scaled variables, the Mann-Whitney U test for categorical variables with two groups and the Jonckheere-Terpstra test for categorical variables with more than two ordinal groups were selected as suitable statistical analyses.

Results

A total of 119 people (97 participants and 22 group leaders) were surveyed at the first measurement.

Demographic characteristics

The group leaders (67.1 ± 4.0 years) were on average 5.1 years younger than the participants (72.2 ± 6.8 years). They also had a higher level of educational attainment. 62.9% of the participants (and 68.2% of the group leaders) had at least one chronic disease. Sociodemographic characteristics and other data are recorded in ◆ Table 1.

Health literacy

17.5% of the participants had excellent health literacy. However, more than a third (37.1%) had limited health literacy. The trend was similar for the group leaders (◆ Table 1).

Dietary behavior

The percentage of group leaders and participants achieving the recommended intake of 5 portions of fruit and vegetables per day was almost identical. However, there were differences between group leaders and participants who consumed 4 or 3 or fewer portions of fruit and vegetables per day (◆ Table 1). The percentage of group leaders (72.7%) who achieved the recommended daily fluid intake was significantly higher than for the participants (56.7%).

Food literacy score

The average score for participants was 3.83 (standard deviation [SD] = 0.43) on the SPFL scale from 1 to 5. The average food literacy score for the group leaders was slightly higher at 3.94 (SD = 0.46) (◆ Figure 1).

Statistical evaluation

Among the participants (the evaluation of the analytical statistics for the group leaders is not shown due to the small group size), the a priori expected positive association between food literacy and health literacy was present. The food literacy score correlated significantly with the health literacy score (r_s = 0.213, p = 0.039, n = 94). At the same time, there was an observable association between the food literacy score and ascending levels of health literacy (inadequate, problematic, adequate and excellent) for this group (T_{JT} = 1841.500, p = 0.019) (◆ Figure 2).

In addition, food literacy was lower among men than among women (U = 601.000, Z = -2.770, p = 0.005). Furthermore, food literacy was lower among those with chronic disease than among those without (U = 686.500, Z = -2.902, p = 0.004). However, there is no significant difference in food literacy scores between people with different levels of educational attainment.

The participants' food literacy scores also correlated with their fruit and vegetable consumption. Participants who had a higher daily fruit and vegetable consumption also had a higher food literacy score (T_{JT} = 1731.000, p = 0.036). However, there was no significant difference in food literacy scores between people who achieved the recommended daily fluid intake of 1.5 liters per day and those who did not.

Discussion

As expected, the participants' food literacy and health literacy were positively correlated with each other. The observed differences in food literacy—which depend on sociodemographic factors (gender, chronic diseases) and fruit and vegetable consumption—have also been observed in other studies on health literacy and food literacy [6, 7, 16, 26].

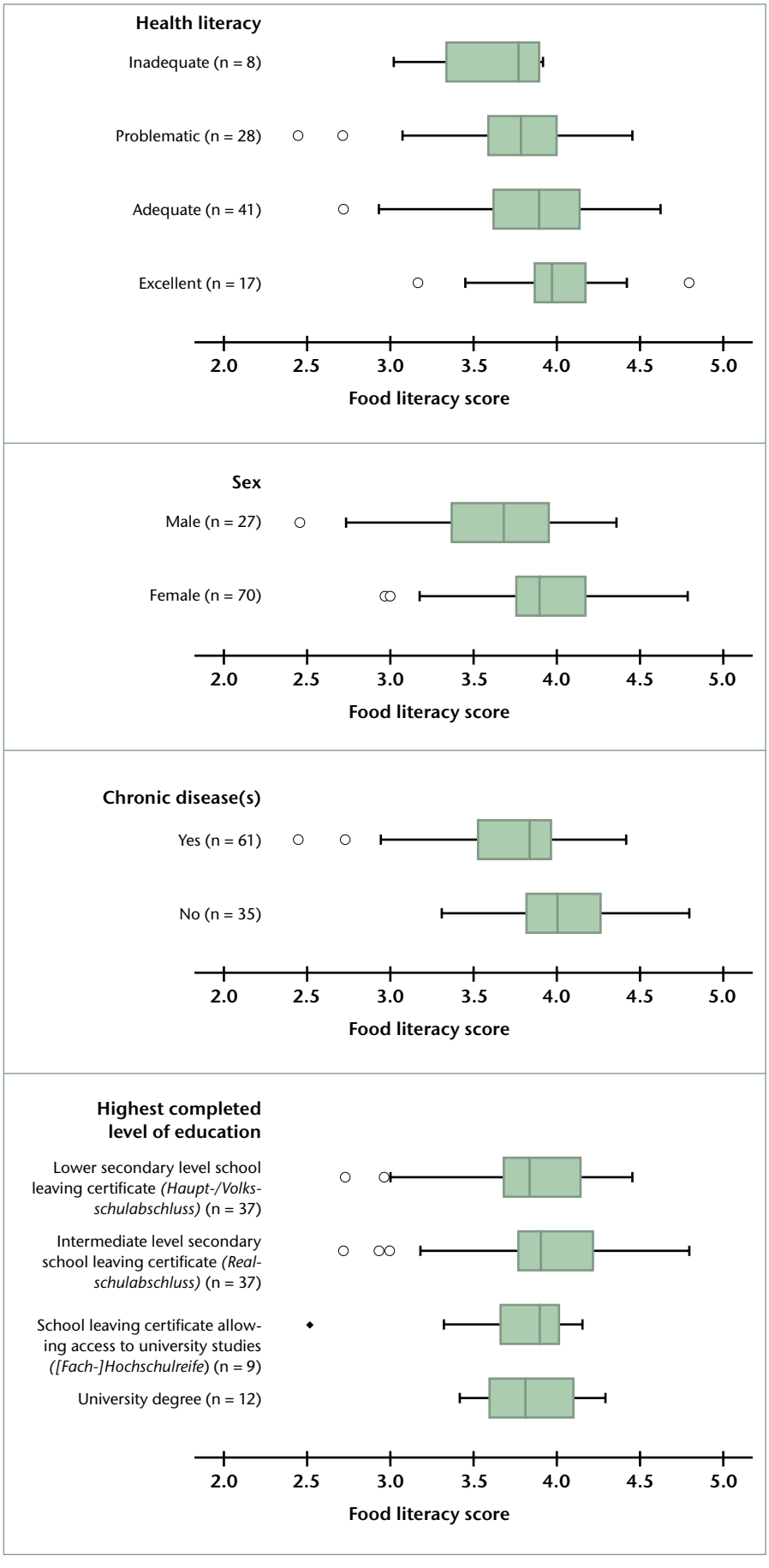
Based on these results with regard to food literacy and sociodemographic factors, the group leaders ought to have had a lower level of food literacy compared to the other participants because there were more men and people with chronic diseases among the group leaders. However, the group leaders actually had a slightly higher level of food literacy than the other participants on average.

Furthermore, the expected difference in food literacy in connection with the highest level of educational attainment was not found, despite the fact that according to studies, people with a lower level of educational attainment have comparatively lower levels of health literacy [16]. The analysis suggests that this trend cannot be extrapolated to food literacy in the age group studied in the present study.

Moreover, no statistically significant difference in food literacy levels was found between those who achieved the recommended daily fluid intake and those who did not. This may be attributable to the fact that the SPFL scale does not take the implementation of dietary recommendations into account. There is therefore no positive influence on results for respondents who have an adequate daily fluid intake.

Compared to results from other studies, daily fruit and vegetable consumption among the participants in this study was relatively high [16, 34]. Their food literacy level was also higher than the average for the German population aged 60–69 years [18]. One reason for this could be that older people who were interested in the program may have been more likely to have healthier behaviors and dietary habits. In this study, the percentage of people with one or more chronic diseases was also higher than the German average for people over 65 years of age [35]. Living with a chronic disease may have caused affected participants to be more aware of the importance of a balanced diet and may have prompted more of them to participate in this group program.

The aforementioned discrepancies between the initial hypothesis and the data found suggest that other aspects—besides skills of daily liv-



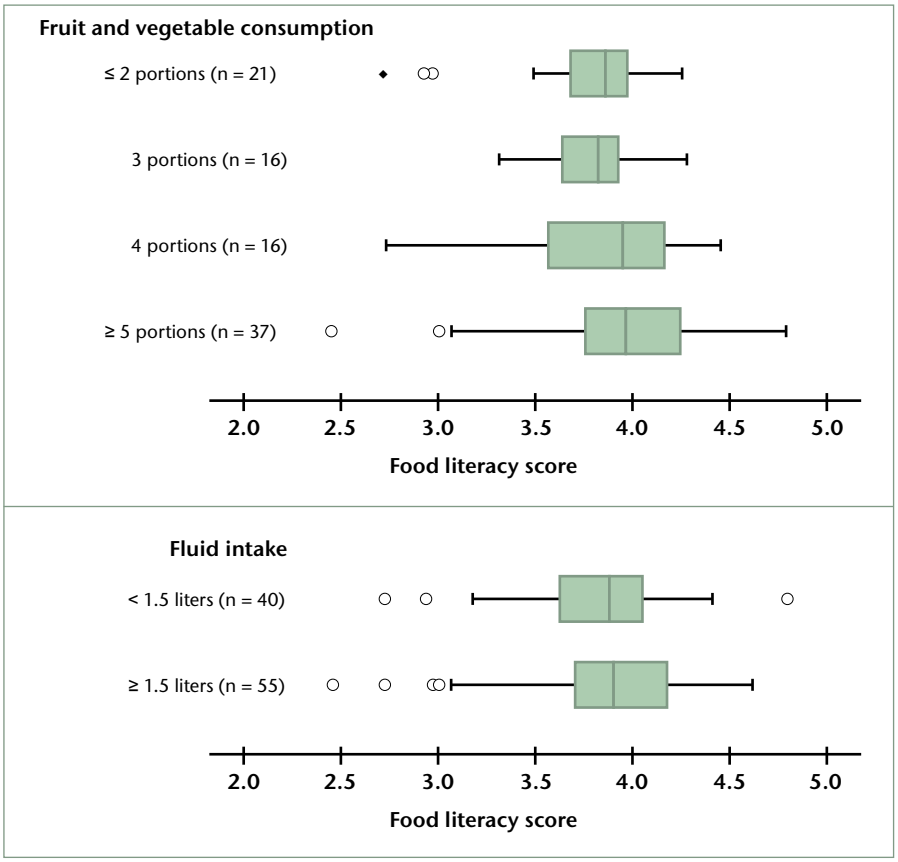


Fig. 2: **Associations between food literacy scores and selected variables**
The p-values were calculated using the Mann-Whitney U test for sex, presence of chronic disease and fluid intake, and using the Jonckheere-Terpstra test for health literacy, level of educational attainment and fruit and vegetable consumption. The expected differences in food literacy scores depending on health literacy, gender, presence of chronic disease and fruit and vegetable consumption are significant at a significance level of 0.05.

ing and social aspects—that the SPFL scale does not take into account may contribute to food literacy. The questions about food literacy according to Poelman et al. (2018) also have a very practical focus. For example, the ability to modify a dish does not require more factual nutritional knowledge, with the result that a person can be recorded as having a higher level of food literacy in this aspect even without such knowledge. However, according to Deroover et al. (2020) [13], it is these very practical skills that appear to contribute to actual dietary behavior. It is therefore likely that food literacy and health literacy cannot be assessed in the same way and that a higher level of education (in this age group) for instance does not lead to an increase in food literacy.

Limitations

All of the data collected in the study were self-reported. It is therefore possible that there may have been some bias in the respondents' statements. For example, statements on dietary behavior may have corresponded more with good intentions or social desirability than with reality. Contrary to initial assumptions, in order to obtain a more objective picture of food literacy, it is not sufficient have a second step in the survey in which health literacy (or the functional degree of health literacy, see [18]) is recorded along with dietary behavior as a proxy measure. This is because as explained above, it is not so much factual knowledge about nutrition that appears to be relevant in determining actual dietary behavior, but rather practical skills. The results presented here for food literacy and health literacy scores and selected food groups highlight the fact that the food literacy and health literacy construct as a whole remains incomplete. Due to the small sample size, no analysis was performed to examine whether the statistical results remain valid after adjustment.

Conclusions

A high level of food literacy is associated with health-promoting dietary behavior. However, it remains unclear which specific areas of skill contribute to comprehensive food literacy or how these skills can be measured. Furthermore, it is not yet sufficiently clear which areas influence the dietary behavior of older adults. The results discussed here indicate that it is mainly the fundamental practical aspects of food literacy that support a balanced diet.

Compliance with ethical guidelines
The Ethics Committee of the Coburg University of Applied Sciences and Arts has examined this project in accordance with its ethical guidelines and has declared it to be ethically sound. All of the study participants gave their written consent to participation in the study.

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Conflict of Interest
The authors declare no conflict of interest.

References

1. Döbert M, Anders MP: Health Literacy im Kontext von Alphabetisierung und Grundbildung. In: Korfkamp J, Löffler C (eds.): Handbuch zur Alphabetisierung und Grundbildung Erwachsener. Münster: Waxmann 2016.
2. Büning-Fesel M: Die Förderung von Selbstbestimmung und Entscheidungskompetenz im Ernährungshandeln. aid Infodienst Spezial 2008; 4: 1–6.
3. Velardo S: The nuances of health literacy, nutrition literacy, and food literacy. J Nutr Educ Behav 2015; 47(4): 385–9.e1.
4. Krause C, Sommerhalder K, Beer-Borst S, Abel T: Just a subtle difference? Findings from a systematic review on definitions of nutrition literacy and food literacy. Health Promot Int 2018; 33(3): 378–89.
5. Cullen T, Hatch J, Martin W, Higgins JW, Sheppard R: Food literacy: definition and framework for action. Can J Diet Pract Res 2015; 76(3): 140–5.
6. Poelman MP, Dijkstra SC, Sponselee H, et al.: Towards the measurement of food literacy with respect to healthy eating: the development and validation of the self perceived food literacy scale among an adult sample in the Netherlands. Int J Behav Nutr Phys Act 2018; 15(1): 54.
7. Gréa Krause C, Beer-Borst S, Sommerhalder K, Hayoz S, Abel T: A short food literacy questionnaire (SFLQ) for adults: findings from a Swiss validation study. Appetite 2018; 120: 275–80.
8. Palumbo R, Annarumma C, Adinolfi P, et al.: Crafting and applying a tool to assess food literacy: findings from a pilot study. Trends in Food Science & Technology 2017; 67: 173–82.
9. Amouzandeh C, Fingland D, Vidgen HA: A scoping review of the validity, reliability and conceptual alignment of food literacy measures for adults. Nutrients 2019; 11(4): 801.
10. Vidgen HA, Gallegos D: Defining food literacy and its components. Appetite 2014; 76: 50–9.
11. Johannsen U, Schlapkohl N, Kaiser B: Food & Move Literacy in der Erwachsenenbildung – Kompetenzanforderungen im Bereich der Alphabetisierung und Grund-bildung. ZfW 2019; 42(2): 265–87.
12. Boucher BA, Manafò E, Boddy MR, Roblin L, Truscott R: Stratégie sur l'alimentation et la nutrition de l'Ontario établissement d'indicateurs de l'accès aux aliments et de l'alphabétisme alimentaire pour un premier suivi de l'environnement alimentaire. Health Promot Chronic Dis Prev Can 2017; 37(9): 313–9.
13. Deroover K, Bucher T, Vandelanotte C, Vries H de, Duncan MJ: Practical nutrition knowledge mediates the relationship between sociodemographic characteristics and diet quality in adults: a cross-sectional analysis. Am J Health Promot 2020; 34(1): 59–62.
14. Nutbeam D: The evolving concept of health literacy. Soc Sci Med 2008; 67(12): 2072–8.
15. Sørensen K, van den Broucke S, Fullam J, et al.: Health literacy and public health: a systematic review and integration of definitions and models. BMC Public Health 2012; 12: 80.
16. Schaeffer D, Vogt D, Berens E-M, Hurrelmann K: Gesundheitskompetenz der Bevölkerung in Deutschland: Ergebnisbericht. Universität Bielefeld, Fakultät für Gesundheitswissenschaften 2016.
17. Quenzel G, Vogt D, Schaeffer D: Unterschiede der Gesundheitskompetenz von Jugendlichen mit niedriger Bildung, Älteren und Menschen mit Migrationshintergrund. Gesundheitswesen 2016; 78(11): 708–10.
18. Kolpatzik K, Zaunbrecher R: Ernährungskompetenz in Deutschland. Berlin: KomPart 2020.
19. Heseker H: Ernährungssituation in Deutschland. In: Deutsche Gesellschaft für Ernährung (ed.): 13. DGE-Ernährungsbericht. Bonn 2016; 17–101.
20. Begg DP: Disturbances of thirst and fluid balance associated with aging. Physiol Behav 2017; 178: 28–34.
21. Deutsche Gesellschaft für Ernährung (DGE): Obst und Gemüse in der Prävention chronischer Krankheiten. Ernährung 2007; 1(9): 410–3.
22. Deutsche Gesellschaft für Ernährung (DGE): Prävention von KHK. Ernährung 2008; 2(1): 30–2.
23. Colatruglio S, Slater J: Challenges to acquiring and utilizing food literacy: perceptions of young Canadian adults. CFS/RCÉA 2016; 3(1): 96.
24. Palumbo R: Sustainability of well-being through literacy. The effects of food literacy on sustainability of well-being. Agriculture and Agricultural Science Procedia 2016; 8: 99–106.
25. Grunert KG, Wills J, Celemín LF, Lähteenmäki L, Scholderer J, Storcksdieck genannt Bonsmann S: Socio-demographic and attitudinal determinants of nutrition knowledge of food shoppers in six European countries. Food Quality and Preference 2012; 26(2): 166–77.
26. Clouston SAP, Manganello JA, Richards M: A life course approach to health literacy: the role of gender, educational attainment and lifetime cognitive capability. Age Ageing 2017; 46(3): 493–9.
27. Deutsche Gesellschaft für Ernährung (DGE): Vollwertig essen und trinken nach den 10 Regeln der DGE. www.dge.de/fileadmin/public/doc/fm/10-Regeln-der-DGE.pdf (last accessed on 29 May 2020).
28. GUSTO – Gemeinsam gesund älter werden mit Genuss. www.gusto-jetzt-geniesse-ich.de/ (last accessed on 29 May 2020).
29. Sørensen K, van den Broucke S, Pelikan JM, et al.: Measuring health literacy in populations: illuminating the design and development process of the European Health Literacy Survey Questionnaire (HLS-EU-Q). BMC Public Health 2013; 13: 948.
30. Jordan S, Hoebel J: Gesundheitskompetenz von Erwachsenen in Deutschland. Ergebnisse der Studie „Gesundheit in Deutschland aktuell" (GEDA). Bundesgesundheitsblatt Gesundheitsforschung Gesundheitsschutz 2015; 58(9): 942–50.
31. Zok K: Unterschiede bei der Gesundheitskompetenz. Ergebnisse einer bundesweiten Repräsentativ-Umfrage unter gesetzlich Versicherten. WIdO monitor 2014; 11(2): 1–12.
32. Sørensen K, Pelikan JM, Röthlin F, et al.: Health literacy in Europe: comparative results of the European Health Literacy Survey (HLS-EU). Eur J Public Health 2015; 25(6): 1053–8.
33. Truthmann J, Mensink GBM, Richter A: Relative validation of the KiGGS food frequency questionnaire among adolescents in Germany. Nutr J 2011; 10: 133.
34. Mensink GBM, Schienkiewitz A, Lange C: Obstkonsum bei Erwachsenen in Deutschland. RKI-Bib1 (Robert Koch-Institut) 2017.
35. Robert Koch-Institut (RKI): Chronisches Kranksein: Faktenblatt zu GEDA 2012: Ergebnisse der Studie „Gesundheit in Deutschland aktuell 2012". www.rki.de/geda (last accessed on 3 February 2021).

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Overview 1: **The food literacy questionnaire with 29 individual questions:**

1. Are you able to prepare fresh vegetables in different ways?
   For example cooking [boiling, authors' note]*, steaming or stir frying, or in different dishes?*
2. Do you find it difficult to prepare a meal with more than five fresh ingredients?
3. Are you able to alter a recipe yourself?
   For example if you are missing one of the ingredients?
4. Are you able to prepare fresh fish in different ways?
   For example grilling, pan frying or stewing, or in different dishes?
5. Are you able to prepare a meal using fresh ingredients? So without pre-packed and processed foods?
6. Are you able to see, smell or feel the quality of fresh foods?
   For example of meat, fish or fruit?
7. Are you able to say 'no' to tasty snacks if you want to?
   For example birthday treats or finger foods?
8. Imagine that you are at a place where you see and smell tasty foods. Are you able to resist the temptation of buying them?
   For example at the train station, the petrol station, or at the bakery?
9. Are you able to eat healthily when you feel stressed?
10. Do you choose foods that are in line with your mood?
    For example if you are sad or annoyed?
11. Are you able to eat healthily if the situation deviates from a regular situation?
    For example when you have unexpected guests or experience time pressure?
12. Do you eat the total contents of a bag or container of crisps, candies or cookies in one go?
13. Do you take along healthy snacks for yourself when you are on the go?
    For example fruit, cherry-tomatoes, nuts?
14. Do you eat vegetables as snacks?
15. Do you eat fruit as a snack?
16. Do you have healthy snacks for yourself in stock?
    For example nuts, carrots, cherry tomatoes, or mini cucumbers?
17. Do you find it important to eat at the dinner table if you are eating with others?
18. Do you find it important to eat dinner at the same time if you are with others?
19. Do you engage in any other activities while eating?
    For example reading, working, or watching television?
20. Do you compare the calories, fat, sugar or salt content of different products?
21. Do you check the nutritional labels of products for calories, fat, sugar or salt content?
22. If you have something to eat, do you take account of what you will eat later that day?
23. If you have something to eat, do you reflect on what you have eaten earlier that day?
24. Do you purchase healthy foods, even if they are a bit more expensive?
    For example vegetables, fruit, or whole grain products?
25. Do you purchase healthy food, even if you have limited money?
    For example vegetables, fruit, or whole grain products?
26. Do you have 4 or more packages of crisps, pretzels or savoury snacks in stock?
27. Do you have 4 or more packages of candy, cookies or chocolate in stock?
28. Do you have 4 or more bottles of sugar sweetened beverages or lemonade with sugar in stock?
29. Do you have 4 or more cartons of fruit juice in stock?

(wording from [6])