



Food insecurity among food bank "Tafel" clients during the COVID-19 pandemic

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Abstract

The aim of the study was to investigate the prevalence of food insecurity among bank clients during the COVID-19 pandemic, how the clients realized their access to food, the extent to which they received social support and what association the latter two aspects show with food insecurity. For this purpose, a written and oral survey was conducted in 2020 and 2021 among a total of 985 food bank clients. Descriptive and regression analyses, stratified for 2020 and 2021, were used. The results show a high prevalence of poor social support and food insecurity among respondents. Most participants received food from the food bank at least three times a month for more than a year. Aspects related to food insecurity included family status, social support and the relative amount of food received from the food bank. The article concludes with recommendations for action derived from the results.

Citation

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Introduction

Before the COVID-19 pandemic began in 2019, it was estimated that up to 1.65 million people visited a total of 956 Tafel food banks across Germany [1]. Despite the high number, food bank clients have so far been rarely involved in health or nutritional studies. The few earlier studies describe food bank clients as a heterogeneous group in terms of their level of education, with a low income and the majority of them receiving social benefits [2–4]. A study of more than 1,000 Tafel clients in three cities (Berlin, Stuttgart, Karlsruhe) in the year 2015 reported that over 35% of respondents had experienced moderate or severe food insecurity in the previous 12 months [2]. Food insecurity is defined as at least temporarily limited access to adequate, i. e. sufficiently nutritious, safe and culturally accepted food [5]. A characteristic feature of food insecure people is the restriction of food variety to low-cost, filling products combined with the worry of not having enough money for food, e.g. at the end of the income month. If the situation worsens further, restriction of food quantities or even hunger can occur [6,7].

Given the associations between food insecurity and diet quality [8,9] and the physical and, in particular, mental health of children and adults observed in other high-income countries [10,11], the issue of food insecurity has received greater political and scientific attention in Germany in recent years. In its statement "Food poverty under pandemic conditions", the Scientific Advisory Board for Agricultural Policy, Food and Consumer Health Protection at the Federal Ministry of Food and Agriculture (WBAE) examined, among other things, the question of what consequences the closure of Tafel food banks due to the lockdown could have for population groups at risk of food insecurity [12].

The start of the COVID-19 pandemic and the associated first lockdown led to considerable restrictions on the offer of food banks [13]. Almost 60% of the more than 400 food banks surveyed had closed at least temporarily between March and May 2020 [13]. Although most of them were open again in summer 2020, many food banks had modified their food distribution to a low-contact variant, e.g. by using pre-packed bags, moving the food distribution outside and/or offering a delivery service [13]. While the impact of the COVID-19 pandemic on Tafel food banks has already been described, the data available to



answer the WBAE's question above is still scarce and it is largely unknown to what extent food bank clients were affected by food insecurity during the pandemic, how they realized their access to food through food banks and commercial stores, to what extent they received social support and what associations exist between the latter two aspects and food insecurity.

The "Food Insecurity Among Tafel users" (FINATA) project, which was initiated before the pandemic and adapted at the start of the pandemic, aimed to close these research gaps by conducting a survey among food bank clients. The adaptation of the project also offered the opportunity to compare the results of different recruitment and data collection methods.

Method

Study design

FINATA is a cross-sectional study. With the start of the COVID-19 pandemic, it became necessary to adapt the originally planned protocol so that the questionnaire was adjusted, and a written survey was conducted in winter 2020 and a face-to-face survey in late fall 2021. The survey of Tafel clients was approved by the ethics committee of the University of Hohenheim.

Procedure

In December 2019, the managers of all member food banks of Tafel Deutschland e. V. were informed by post and email about the objectives and organization of the study and asked for their consent to the customer survey. After the start of the survey was postponed due to the pandemic, 114 food banks that had initially given their consent were asked again by telephone in September 2020 to confirm their consent. Of the 114 food banks, 62 agreed to participate, 18 declined and 25 either could not be reached or left their participation open.

Eligible participants were those who were at least 18 years old and had authorization to use the respective Tafel food bank as well as sufficient reading skills in at least one of the seven languages offered (German, English, French, Russian, Turkish, Farsi, Arabic). A total of 5,716 study documents, each consisting of study information, declaration of participation and questionnaires, were sent to the Tafel food banks willing to participate in German, 824 in English, 405 in French, 1,076 in Turkish, 1,358 in Russian, 2,373 in Arabic and 965 in Persian. The participating food banks were instructed to hang up prepared posters with information about the study in the food bank and to hand out a study package consisting of study information, consent form and questionnaire to each customer household.

The completed questionnaires were either placed in a box on site and collected by the Tafel food banks or sent back to the study team in prepared envelopes by the participants. No compensation was provided for the participants. One food bank thanked the participating clients with a packet of coffee.

After the easing of the coronavirus restriction measures, personal recruitment and interviews were possible at the *Schwäbische Tafel Stuttgart* e. V. between 18 October and 12 November 2021. Each of the four Tafel stores was visited by two interviewers on five

consecutive days for four to five hours a day during opening hours. While the clients were packing their groceries after shopping, they were approached by the interviewers. They introduced the project and invited interested clients to complete the questionnaire on site. As German, English and Arabic were spoken by the interviewers, clients with knowledge of one of these three languages could be offered support in completing the questionnaire or the oral survey. Due to the time savings (the questions were often answered while the food was being packed), most participants preferred the personal interview. All participants gave their consent verbally and by ticking a box on the consent form.

Data collection instruments

The questionnaire consisted of four parts. The questionnaire for recording food insecurity (see below) was already available from an earlier study [2] in a slightly adapted form in German, English, Russian and Arabic. All other study documents, including the questionnaires, were translated by a professional translation agency into the six other languages mentioned above (available in German) and then checked for comprehension by German-speaking native speakers.

Questionnaire on socio-demographics and health status

Large parts of the questionnaire on sociodemographic and health data were developed and tested as part of a survey at the Berliner Tafel e. V. [14]. The questionnaire was based on the "Health questionnaire 18 to 64 years" of the German health interview and examination survey for adults (DEGS) [15]. This part of the questionnaire was used to collect socio-demographic data (e. g. age, educational level, marital status) and health-related data (height and weight, chronic diseases, smoking status) by means of predominantly closed questions.

Shopping and food bank usage behavior

Based on international literature [16] and previous surveys [3,14], a questionnaire was developed on the shopping behavior and food bank usage behavior of food bank clients, which included questions on the duration and frequency of use of the food bank, changes in the frequency of use since the beginning of the pandemic, the proportion of food from the food bank to all food in the household and the frequency of shopping outside the food bank. Most of the questions related to the last 30 days before the survey.



Social support

The Oslo-3-Items-Social-Support Scale (OSS-3) [17,18] was used to assess social support. The questionnaire measures how many people one can rely on in case of serious problems, how many show interest and sympathy in what one is doing and how easy it would be to get practical help from the neighbors if one needed it. The OSS-3 measures the perceived availability of social support. The individual scores from the three questions are added together. Based on the total score, three classifications are made: low (3–8 points), medium (9–11 points) and strong social support (12–14 points) [19]. The internal consistency (Cronbach's alpha) determined in the representative sample was $\alpha = 0.64$; the construct validity of the survey instrument has been confirmed multiple times [20].

Food insecurity

The Food Insecurity Experience Scale (FIES) [21], developed and validated by the Food and Agriculture Organization of the United Nations (FAO), was used to assess food insecurity. The questionnaire contains eight closed questions and measures experiences with food insecurity over the last 30 days. It asks about worries about and experiences of limited access to food in terms of quality and quantity due to a lack of financial resources. The categorization of food insecurity was based on the number of affirmative responses according to an earlier study on food insecurity among food bank clients [2]. According to this, participants with no affirmative answers were considered food insecure, with one to three affirmative answers as midly food insecure, with four to seven affirmative answers as severely food insecure.

Statistical analyses

The data from the customer survey were first described descriptively using absolute and relative frequencies, mean, standard deviation and median stratified by survey location/type/year (2020 vs. 2021). In addition, the Pearson chi-square test was used to investigate whether the study populations of 2020 and 2021 differed in nominal and ordinal variables, respectively. If at least 20 percent of the cells in the cross-tabulations had an expected cell frequency < 5, the Fisher's exact test [22] was performed. For 2 x 2 crosstabulations, the correction according to Yates [23] was performed for the chi-square statistic. Differences in metric variables by survey year were examined by using the unpaired t-test, or in the case of non-normal distributions, by using the Mann-Whitney test. Due to the different recruitment and data collection and the found differences, the subsequent analyses were stratified by survey year (2020 vs. 2021). Binary logistic regression analyses were performed with food insecurity (moderately or severely food insecure vs. food secure or mildly food insecure) as the dependent variable and the following potential independent variables: Age in years, sex, country of birth (Germany vs. other country), educational qualification dichotomized (completed at least apprenticeship vs. no educational gualification), marital status (dummy variables: married/living in partnership, single, widowed, divorced/separated), affected by obesity (no vs. yes), smoking status dichotomized (non-smoker vs. smoker), social support dichotomized (medium or high social support vs. low social support), presence of at least one chronic disease (not present vs. present), duration of food bank use (less than one year vs. at least one year), frequency of food bank use in the previous 30 days (less than three times vs. at least three times), proportion of food in the household from the food bank (less than half from the food bank vs. at least half of the food from the food bank), frequency of shopping outside the food bank in the previous 30 days, travel time to the main food shop outside the food bank in the previous 30 days in minutes. Due to the exploratory nature of the study, the selection of the independent variables for the models followed the procedure of Hosmer and Lemeshow [24, 25]. Multicollinearity of the predictors was inferred if the variance inflation factor was greater than 10.0. The results were presented as odds ratio (OR) and 95% confidence intervals. The analysis was performed using IBM SPSS Statistics 27. P-values < 0.05 were considered significant unless otherwise stated.

Results

Socio-demographic description of the study population

• Table 1 shows the socio-demographic characteristics of the 985 participants by survey year and overall. In 2020, 565 Tafel clients and in 2021, 420 Tafel clients took part in the survey. The data show that the study populations of the 2020 and 2021 survey periods differ in all the socio-demographic characteristics examined, with the exception of the gender and length of stay in Germany of respondents who were not born in Germany.

In 2020, of the 62 food banks that had confirmed their participation, 44 food banks from nine federal states (excluding Thuringia, Hesse, Bremen, Hamburg and Berlin) actually recruited participants. The remaining food banks did not take part in the recruitment process for various reasons. Food bank location could be assigned to 452 of the 565 food bank clients who took part in 2020. Accordingly, 44,5% of the participants were clients of a food bank in a non-rural district or an independent city (according to the typology of the *Thünen Institute's Landatlas* [26]), 15,7% came from a food bank in a very rural district with a less favorable socio-economic situation, 11,3% from a food bank in a very rural district with a good socio-economic situation, 17,9% from a food bank in a rural district with a less good socio-economic situation and 10,6% from a food bank in a rural district with a good socio-economic situation.

Food bank use and shopping behavior of the participants

• Table 2 shows the examined variables of the participants' food bank use and shopping behavior by survey year and overall. The majority of participants in both survey years had been visiting the food bank for more than a year at the time of data collection, at least three times a month and received at least half of their food from the food bank. However, around 27% of participants went to the food bank for the first time in the previous year, i.e. during the COVID-19 pandemic. In addition, the majority of participants bought food outside the food bank once or twice a week in a commercial store. The participants in 2020 and those in 2021 also differed in the variables examined with regard to food bank use and shopping behavior, except for the duration of food bank use.

Social support, health aspects and food insecurity of the participants

• Table 3 shows the social support, health support and food insecurity over the previous 30 days.

Overall, around 58% of respondents negate all FIES items and were therefore considered food secure in the 30 days prior to the survey; however, almost 18% were moderately or severely food insecure. Of the items used to measure food insecurity, between a quarter and a third of participants responded in the affirmative to the items measuring the psychological aspect of food insecurity ("having worried") and the items measuring the reduction in the quality of the food supply ("not being able to eat healthy and varied food" and "only being able to choose between a few different foods") (Figure 1). The experienced social support, the status of food insecurity and some health aspects examined significantly differed between the years of data collection.

		Year of data		
Characteristic	overall	2020ª	2021 ^b	test
Sex number of participants, n ^c female male	973 561 (57.7) 412 (42.3)	554 307 (55.4) 247 (44.6)	419 254 (60.6) 165 (39.4)	$\chi^2 = 2.44$ p = 0.12
Age in years number of participants, n ^c mean (SD) median	964 51.1 (15.4) 52.0	546 53.8 (15.5) 55.0	418 47.6 (14.6) 46.5	U = 88153.5 p < 0.001
Nationality number of participants, n ^c German other	975 475 (48.7) 500 (51.3)	557 370 (66.4) 187 (33.6)	418 105 (25.1) 313 (74.9)	χ ² = 161.44 p < 0.001
Country of birth number of participants, n ^c German other	973 340 (34.9) 633 (65.1)	555 276 (49.7) 279(50.3)	418 64 (15.3) 354 (84.7)	χ ² = 122.74 p < 0.001
Duration of residence in Germany, if not born in Germany, in years number of participants, n ^c mean (SD) median	552 13.6 (13.5) 6.0	245 14.7 (13.7) 10.0	307 12.8 (13.2) 6.0	U = 36,127.5 p = 0.43
School-leaving qualification number of participants, n ^c no school-leaving certificate (yet) lower secondary school (up to 9 th grade) secondary school (up to 11 th grade) upper secondary school (up to 13 th grade)	934 218 (23.3) 230 (24.6) 243 (26.0) 246 (26.3)	521 85 (16.3) 158 (30.3) 163 (31.3) 118 (22.6)	413 133 (32.2) 72 (17.4) 80 (19.4) 128 (31.0)	χ ² = 61.34 p < 0.001
Highest level of education number of participants, n ^c no qualification (yet) completed training (including vocational training, bachelor etc.)	916 410 (44.8) 506 (55.2)	503 164 (32.6) 339 (67.4)	413 246 (59.6) 167 (40.4)	χ ² = 66.67 p < 0.001
Marital status number of participants, n ^c married/living with someone in partnership divorced/separated widowed single	971 502 (51.7) 219 (22.6) 60 (6.2) 190 (19.6)	553 225 (40.7) 153 (27.7) 44 (8.0) 131 (23.7)	418 277 (66.3) 66 (15.8) 16 (3.8) 59 (14.1)	χ ² = 62.74 p < 0.001

Tab. 1: Socio-demographic characteristics of participants by survey year; unless otherwise stated

absolute frequencies (in brackets in percent) ^a recruitment via Tafel volunteers and workers in 44 local Tafel food banks; written data collection; ^b proactive recruitment in Stuttgart; oral and written data collection; ^c differences to n = 985 total, n = 565 in 2020 and n = 420 in 2021 are due to missing data: SD: standard deviation



¹ It should be noted that most food banks allow their customers to shop once a week. Many food banks in Baden-Württemberg do not apply a frequency limit based on the principle of a social supermarket or at least allow a higher frequency.

		Year of data		
Characteristic	overall	2020ª	2021 ^b	test
Frequency of food bank use in the last 30 days number of participants, n ^c < three times ≥ three times	980 181 (18.5) 799 (81.5)	560 72 (12.9) 488 (87.1)	420 109 (26.0) 311 (74.0)	χ ² = 26.47 p < 0.001
Frequency of food bank use in the last 30 days compared to before the pandemic number of participants, n ^c less frequently just as often more frequently	922 188 (20.4) 616 (66.8) 118 (12.8)	508 83 (16.3) 406 (79.9) 19 (3.7)	414 105 (25.4) 210 (50.7) 99 (23.9)	χ ² = 110.74 p < 0.001
Relative amount of food the house- hold received from the food bank in the last 30 days number of participants, n ^c < half ≥ half	960 329 (34.3) 631 (65.7)	541 224 (41.4) 317 (58.6)	419 105 (25.1) 314 (74.9)	χ ² = 27.28 p < 0.001
Duration of food bank use number of participants, n ^c ≤ 1 year > 1 year	979 260 (26.6) 719 (73.4)	559 150 (26.8) 409 (73.2)	420 110 (26.2) 310 (73.8)	$\chi^2 = 0.023$ p = 0.88
Frequency of food shopping in the last 30 days. other than in the food bank number of participants, n ^c less frequently 2–3 times/30 days 1–2 times/week 3–4 times/week (almost) every day	974 53 (5.4) 125 (12.8) 556 (57.1) 160 (16.4) 80 (8.2)	559 30 (5.4) 90 (16.2) 320 (57.7) 91 (16.4) 24 (4.3)	419 23 (5.5) 35 (8.4) 236 (56.3) 69 (16.5) 56 (13.4)	χ ² = 35.34 p < 0.001
Travel time to the main food shop. one way in minutes number of participants, n ^c mean (SD) median	969 13.9 (9.3) 13.0	551 14.8 (9.2) 13.0	418 12.6 (9.2) 8.0	U = 97,046.5 p < 0.001

Tab. 2: Tafel food bank use and food shopping behavior of participants by survey year; unless otherwise stated absolute frequencies (in brackets in percent)

^a recruitment via Tafel volunteers and workers in 44 local Tafel food banks; written data collection; ^b proactive recruitment in Stuttgart; oral and written data collection; ^c differences to n = 985 total, n = 565 in 2020 and n = 420 in 2021 are due to missing data; SD: standard deviation

• Table 4 shows the final regression models for the relationships between food insecurity and the variables examined for the participants in 2020 and 2021. Both the model for 2020 (χ^2 [10, n = 275] = 53.69, p < 0.001) and the model for 2021 (χ^2 [8, n = 380] = 27.18, p > 0.001) were statistically significant. There was no multicollinearity. Nagelkerke's R was 0.27 (2020) and 0.14 (2021).

Discussion

For the first time, the FINATA project examined aspects of food insecurity, shopping behavior, health aspects and food insecurity of food bank clients during the COVID-19 pandemic.



Almost 18% of respondents suffered from moderate or severe food insecurity in the previous 30 days. A comparison with the results of the 2015 study on food insecurity [2] is not possible, as the latter recorded the 12-month prevalence of food insecurity. Studies using other instruments to measure food insecurity at household level showed that the prevalence at a 30-day interval is only about half of the prevalence at a 12month interval [27,28]. Notwithstanding methodological limitations, a doubling of the 30-day prevalence of moderate or severe food insecurity observed in the present study would correspond approximately to the 12-month prevalence reported by Depa and colleagues [2].

Supporting the results of 2015 study [2], in both samples - 2020 and 2021 - single food bank clients had higher odds of being moderately or severely food insecure compared to married or partnered clients. International studies have also shown that marital status moderates the widely confirmed association between food insecurity and a tendency towards poorer mental health [29,30]. Likewise, in both samples, participants whose households received at least half of their food from the food bank in the previous 30 days had lower odds of being food insecure compared to participants whose households received proportionately less food from the food bank. This could indicate that customer households that (have to) buy proportionately more food in commercial stores are more likely to be food insecure. However, these results do not allow conclusions about whether and to what extent the food offered at food banks influences dietary quality, e.g. in terms of variety.

In line with international studies [31-33], participating food bank clients with poor levels of experienced social support had higher odds of being food insecure in 2020 compared to those with intermediate or strong levels of social support. Compared to the representative general population with a low level of education (women: around 23%, men: around 26% [34]) significantly more respondents in this study (68%) were affected by a poor level of experienced social support. Although the influence of the pandemic-related contact restrictions, including the contact restrictions in food banks [13], on the social support experienced by participants cannot be determined with certainty, it can be assumed that the social situation has worsened for many food bank clients during the pandemic.



Limitations

Like all studies, the survey is also subject to limitations. All information provided by participants is based on self-reporting and is therefore subject to various sources of bias, such as recall bias.

The participants who were recruited via the Tafel volunteers and workers in 2020 and those who were proactively recruited and surveyed in Stuttgart in 2021 differed in key socio-demographic information. It can be assumed that the different recruitment methods selected different customer groups. As with all cross-sectional studies, the present results do not allow any causal conclusions to be drawn. The survey took place during a difficult period for both the food banks and their clients, when COVID-19 incidences were rising again almost nationwide, and many food banks were busy initiating and maintaining various protective and hygiene measures. This presumably also explains why only some of the food banks that had previously agreed to take part actually did so. Possible selection bias at the level of the Tafel food banks cannot be ruled out.

² Chance is not to be understood here as positive in the sense

(probability ratio = probability/counter-probability).

of the prospect of success but rather as a statistical term

	Year of data		
overall	2020ª	2021 ^b	test
928 631 (68.0) 237 (25.5) 60 (6.5)	514 325 (63.2) 156 (30.4) 33 (6.4)	414 306 (73.9) 81 (19.6) 27 (6.5)	$\chi^2 = 14.30$ p < 0.001
935 28.3 (6.0) 27.4	519 28.6 (6.5) 27.6	416 28.0(5.3) 27.4	U = 104,600.5 p = 0.41
12 (1.3) 283 (30.3) 348 (37.2) 292 (31.2)	7 (1.3) 158 (30.4) 179 (34.5) 175 (33.7)	5 (1.2) 125 (30.0) 169 (40.6) 117 (28.1)	$\chi^2 = 4.70$ p = 0.20
969 688 (71.0) 281 (29.0)	551 369 (67.0) 182 (33.0)	418 319 (76.3) 99 (23.7)	$\chi^2 = 6.64$ p = 0.002
964 357 (37.0) 607 (63.0)	545 153 (28.1) 392 (71.9)	419 204 (48.7) 215 (51.3)	χ ² = 42.29 p < 0.001
757 442 (58.4) 181 (23.9) 104 (13.7) 30 (4.0)	361 148 (41.0) 121 (33.5) 78 (21.6) 14 (3.9)	396 294 (74.2) 60 (15.2) 26 (6.6) 16 (4.0)	χ ² = 93.50 p < 0.001
	overall 928 631 (68.0) 237 (25.5) 60 (6.5) 935 28.3 (6.0) 27.4 12 (1.3) 283 (30.3) 348 (37.2) 292 (31.2) 969 688 (71.0) 281 (29.0) 964 357 (37.0) 607 (63.0) 757 442 (58.4) 181 (23.9) 104 (13.7) 30 (4.0)	Year of data overall 2020 ^a 928 514 631 (68.0) 325 (63.2) 237 (25.5) 156 (30.4) 60 (6.5) 33 (6.4) 935 28.3 (6.0) 27.4 28.6 (6.5) 12 (1.3) 7 (1.3) 283 (30.3) 158 (30.4) 348 (37.2) 179 (34.5) 292 (31.2) 175 (33.7) 969 551 688 (71.0) 369 (67.0) 182 (33.0) 182 (33.0) 964 545 357 (37.0) 545 153 (28.1) 607 (63.0) 320 (71.9) 757 361 442 (58.4) 148 (41.0) 181 (23.9) 121 (33.5) 104 (13.7) 78 (21.6) 30 (4.0) 14 (3.9)	Year of data collectionoverall2020 ^a 2021 ^b 928514306 (73.9)631 (68.0)325 (63.2)306 (73.9)237 (25.5)156 (30.4)31 (19.6)60 (6.5)51927 (6.5)93528.3 (6.0)27.627.428.6 (6.5)27.412 (1.3)7 (1.3)5 (1.2)283 (30.3)158 (30.4)125 (30.0)348 (37.2)179 (34.5)169 (40.6)292 (31.2)551369 (67.0)969551369 (67.0)888 (71.0)369 (67.0)281 (29.0)153 (28.1)964545357 (37.0)515 (28.1)9757361148 (41.0)294 (74.2)181 (23.9)121 (33.5)757361148 (41.0)294 (74.2)181 (23.9)121 (33.5)0(4.0)78 (21.6)14.0)16 (4.0)

Tab. 3: Social support and health aspects of participants by survey year; unless otherwise stated

absolute frequencies (in brackets in percent)

^a recruitment via Tafel volunteers and workers in 44 local Tafel food banks; written data collection; ^b proactive recruitment in Stuttgart; oral and written data collection; ^c differences to n = 985 total, n = 565 in 2020 and n = 420 in 2021 are due to missing data; SD: standard deviation



Fig. 1: Food insecurity among the participants Consent in percent of the participants



	Year of data collection					
	2020			2021		
Predictor	OR	95% CI	p-value	OR	95% CI	p-value
Marital status married/in partnership divorced/separated widowed single	ref. 2.50 2.86 4.89	[1.02–6.14] [0.78–10.46] [2–11.98]	0.045 0.11 0.001	ref. 1.87 2.93 2.69	[0.72–4.88] [0.73–11.72] [1.08–6.71]	0.20 0.13 0.033
Smoking status non-smoking smoking	ref. 1.70	[0.88–3.3]	0.12	/	/	1
Social support intermediate/strong poor	ref. 2.93	[1.44–5.94]	0.003	/	/	/
Chronic disease no yes	ref. 1.95	[0.9-4.24]	0.092	ref. 1.85	[0.87–3.93]	0.11
Duration of food bank use ≤ 1 year > 1 year	ref. 0.59	[0.3–1.13]	0.11	ref. 0.54	[0.25–1.17]	0.12
Frequency of food bank use in the last 30 days < three times ≥ three times	ref. 0.47	[0.19–1.18]	0.11	/	/	1
Amount of food the household received from the food bank in the last 30 days < half ≥ half	ref. 0.34	[0.17–0.68]	0.002	ref. 0.46	[0.21–1]	0.050
Travel time to the main food shop	/	/	/	1.04	[1–1.07]	0.042
Frequency of food shopping in the last 30 days < once/week ≥ once/week	ref. 0.58	[0.27–1.26]	0.17	ref. 0.38	[0.17–0.86]	0.020

 Tab. 4: Connection of food insecurity of the participants in 2020 and 2021 with aspects of sociodemography, shopping and health behavior

CI: confidence interval; OR: Odds ratio; ref.: reference

Conclusions

Food bank clients are a heterogeneous population group in terms of socio-demographic characteristics. They differ not only by location (cf. [3]), but presumably also considerably by the recruitment methods and measures used. With regard to the desirability of greater participation of population groups at risk of poverty in nutrition and health research, possible selection effects must be taken into account and access options and recruitment methods must be optimized.

Given the importance of social support for physical and mental health [35], the alarmingly high prevalence of poor social support among the respondents also implies a need for action, which could be countered, for example, with the implementation and further development of low-threshold social integration programs.

The high prevalence of food insecurity shows that the social safety net during the pandemic was not sufficient to meet the basic need for sufficient food for a significant proportion of the food bank clients surveyed. Although the present study shows that the food offered by food banks can possibly reduce the chance of food insecurity among clients, further studies, especially longitudinal studies, are needed on the mechanisms of action.

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