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PREDICTORS OF SELF-PERCEPTIONS OF AGING AND HEALTH AMONG OLDER ADULTS IN TÜRKİYE: THE ROLE OF CRITICAL HEALTH LITERACY, PERCEIVED USEFULNESS OF ICT AND SOCIODEMOGRAPHIC FACTORS

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Abstract

Objectives: This cross-sectional study examines factors shaping Turkish older adults' self-perceptions of aging and health (SPAH), emphasizing sociodemographic characteristics, critical health literacy, and perceived usefulness of information and communication technologies (ICTs).

Materials and Methods: Drawing on data from 450 participants aged 65 and over in Istanbul, this cross-sectional research employs a range of quantitative methods, including descriptive and comparative analyses, cross-tabulations, correlations, and path modeling.

Results: Covariance analyses reveal a positive and significant relationship between perceptions of aging and health ($B>0$, $p<0.05$). The study's central contribution lies in uncovering a potential cognitive link between perceptions of aging and health. Path analysis also indicates that the perceived usefulness of ICTs influences critical health literacy, which in turn affects health perceptions. These results suggest that increasing the perceived usefulness of ICTs and critical health literacy can improve perceptions of aging and health. Another key result highlights that socio-demographically disadvantaged older people—particularly women, widows, and those with lower education and income levels—tend to report more negative perceptions of aging and health, along with lower ICT usefulness and critical health literacy.

Conclusion: The findings underline how cumulative social disadvantages shape older adults' aging and health perceptions. By integrating individual-level cognitive factors with broader social determinants, this study addresses a significant gap in the Turkish context. Future research should track these perceptions over time to contribute to developing comprehensive health policies.

Keywords: Aging perception, critical health literacy, health perception, older people, perceived usefulness, sociodemographic factors.

Introduction

The global and Turkish older adult population is rapidly increasing, making population aging one of the most critical demographic challenges of the 21st century. This transformation highlights the need to foster healthy aging experiences and to understand how societies and individuals perceive and respond to aging for the development of effective social policies.

Self-Perceptions of Aging (SPA) refers to older adults' beliefs, expectations, and attitudes about their aging process.[1] In contrast, self-perception of health reflects an individual's subjective evaluation of their health, including feelings, thoughts, and beliefs about whether they perceive themselves as healthy or unwell.[2] Self-perceptions of aging and health (SPAH) directly shape older adults' physical and psychological health and health behaviors.[3] Individuals' perspectives on aging and health provide critical insights into their future health trajectories.[4] Positive SPAs are associated with higher quality of life and preventive health behaviors, while a positive self-perception of health reduces dementia risk by 50%, underscoring its protective role.[3,5]

Globally, older adults in high-income countries report poorer perceptions of physical, mental, social, and psychological health than those in low- and middle-income countries.[6] In contrast, older adults in low-resource countries are more likely to see aging as linked to loss than those in higher-resource countries.[7] In Türkiye and Eastern Europe, older adults perceive their health more negatively than peers in Northern and Western Europe.[8] However, cross-cultural research on SPAH remains limited, and more comparative studies are needed to understand these differences between countries.[7]

Despite the strong interconnection between these aging and health perceptions and their significant influence on health outcomes, they are often examined in isolation within the literature.[9] Given this gap, the interaction between SPA and health perceptions remains under-researched and warrants comprehensive examination. In Türkiye, studies have examined these concepts separately in relation to other variables, but direct research on the relationship between them is scarce.[10–12] The study endeavors to bridge this gap by delving into the relationships between SPA, health, and sociodemographic characteristics, perceived usefulness of Information Communication Technologies (ICT), and critical health literacy levels of older adults in Türkiye. This study may provide valuable evidence for the development of aging policies that enhance the quality of life for older adults in Türkiye and for strategies aimed at reducing the digital health divide.

Socio-economic and demographic characteristics are key social determinants of health. Within this framework, health literacy reflects individuals' capacity to access and understand health information to make informed decisions for disease prevention and health protection.[13] Although there are a limited number of studies examining the relationship between health literacy and health perceptions in older adults,[10] there are no

studies in Türkiye investigating how health literacy interacts with both aging and health perceptions. For this reason, our study also examines socio-demographic factors and critical health literacy to understand the relationship between social determinants of health and aging and health perceptions.

Finally, alongside health literacy, technology adoption, particularly the perceived usefulness of ICT, represents another critical factor shaping how older adults perceive aging and health. Perceived usefulness reflects individuals' beliefs about how valuable ICTs are for their needs. Perceived usefulness is a key determinant of technology adoption, whereas perceived ease of use exerts only an indirect influence through usefulness.[14] Our study contributes to the literature by revealing the pathways between aging and health perceptions in Türkiye.

Hypotheses

H1: Sociodemographic characteristics (gender, education, and income level) are significantly associated with older adults' perceptions of aging and health.

H2: Sociodemographic characteristics (gender, education, and income level) are significantly associated with critical health literacy and perceived usefulness of ICT.

H3: The perceived usefulness of ICT positively influences the critical health literacy levels of older adults.

H4: Critical health literacy levels significantly influence older adults' health perceptions.

H5: There is a significant relationship between older individuals' aging and health perceptions.

Materials and Methods

Population and Sample

This cross-sectional study population consists of older adults residing in Istanbul. According to the Turkish Statistical Institute,[15] Istanbul's older population totals 1.21 million: 64.5% are aged 65-74, 27.7% are aged 75-84, and 7.9% are aged 85 or older. To achieve a representative sample within a 5% margin of error at a 95% confidence level, at least 385 respondents were required; thus, the study collected data from 450 participants. Sample adequacy for factor analysis was assessed using the Kaiser–Meyer–Olkin (KMO) criterion (0.60–0.70 = sufficient; >0.80 = perfect), with all scale-specific KMO values >0.70 and an overall average KMO calculated at 0.805, indicating good sample adequacy.

As shown in Table 1, participants were recruited from Istanbul districts based on the Socio-Economic Development Index (SEGE). Interviews took place in public spaces where older adults gather, such as

coffeehouses, parks, markets, and women-only community events. To encourage female participation, the team included at least one female surveyor. A total of 670 older adults were approached; 450 of them agreed to participate (67% response rate). Stratified random sampling ensured balanced representation across SEGE regions. Data were collected between September 2023 and April 2024. The main reasons for refusal were lack of time, health issues, or concerns about safety and fraud.

Table 1. Sample Selection Criteria

Category	**Details**
Population	**Individuals aged 65 and above residing in Istanbul.**
Population Size in Istanbul	**1,21 million***
Sample Size	**450**
Inclusion Criteria	Age ≥ 65, Residing in Istanbul, able to communicate in Turkish
Exclusion Criteria	Severe physical or cognitive impairments, living in nursing homes or institutional care, residing outside Istanbul
Sampling Criteria	**Socio-Economic Development Index**
District Distribution	
1st Tier Districts	**Şişli, Beşiktaş, Kadıköy, Bakırköy, Fatih, Ataşehir, Başakşehir, Beyoğlu, Ümraniye, Sarıyer, Üsküdar, Tuzla, Maltepe, Beylikdüzü, Pendik, Esenyurt, Bahçelievler, Zeytinburnu, Bağcılar, Kartal, Bayrampaşa, Kağıthane, Küçükçekmece, Güngören, Büyükçekmece, Eyüpsultan, Adalar, Beykoz, Avcılar**
The Number of Participants	**225**
2nd Tier Districts	**Gaziosmanpaşa, Çekmeköy, Esenler, Silivri, Sancaktepe, Sultangazi, Arnavutköy, Çatalca, Şile, Sultanbeyli**
The Number of Participants	**225**

*This study was based on the 2023 TUIK population data.

Data Collection Instruments

Face-to-face interviews were conducted to address digital literacy differences and ensure clarity, with participants giving voluntary consent. The survey included sociodemographic questions and four validated scales. To measure individuals' health perceptions, the Health Perception Scale, adapted to Turkish by Kadıoğlu and Yıldız, was used.[16] In this 15-item Likert-type scale, higher scores indicate more positive health perceptions. The Brief Aging Perceptions Questionnaire (B-APQ), adapted to Turkish by Özkaptan, Kapucu, and Akyar, assessed aging perceptions with a Cronbach alpha reliability of 0.63, indicating that higher scores reflect more positive aging views.[17] The Critical Health Literacy Scale by Türkoğlu and Kılıç evaluated critical health literacy with a Cronbach alpha of 0.85.[18] The Perceived Usefulness Scale, based on Davis's Technology Acceptance Model (1989) and adapted to Turkish by Kadıoğlu and Yıldız, had a reliability coefficient 0.91.[19]

Participants completed the survey independently or with the interviewer's assistance and received further research information afterward.

Data Analysis

This study employed descriptive and reliability analyses, mean comparison and cross-tabulation tests, data visualization, correlation analyses, confirmatory factor analysis (CFA), and path analysis. The Shapiro-Wilk test assessed normality. For non-normal data with three or more groups, Kruskal-Wallis tests were used, with Mann-Whitney U tests applied for two groups. When Kruskal-Wallis results were significant, Bonferroni-adjusted Dunn post-hoc tests were conducted. Since normality was not met, ANOVA and Tukey-HSD tests were not applied. Spearman's correlations examined relationships between scale scores.

The internal consistency of the scales was assessed using Cronbach's alpha and Omega coefficients, with Omega providing additional validation. Since the data were Likert-scale, polychoric correlation matrices were applied, as they are more appropriate for ordinal data.[20] Bidirectional relationships and causal associations within the research model were examined through path analysis. In both CFA and path analysis, the Diagonally Weighted Least Squares (DWLS) estimation method was used due to its robustness against non-normality.[21] CFA results were interpreted based on the threshold values defined in the literature, and the construct validity of the data was assessed using fit indices.[22]

All statistical analyses were conducted at a significance level of $p<0.05$, and R software was used to obtain the findings. The R packages used in the analyses are lavaan for structural equation modeling, Likert for the analysis of Likert-type scale data, psych for psychometric analyses, and the ggcorrplot package for the visualization of correlation matrices.

Results

Participant Characteristics

Table 2 presents the demographic characteristics of the participants included in the study. According to these findings, the mean age of the participants (n=450) was determined as 71.020 ± 5.767. Examining the gender distribution, 42.20% of the participants were female, while 57.80% were male. In terms of marital status, most participants (75.60%) were married, whereas 17.30% were widowed, 4.00% were divorced, and 3.10% were single. Regarding educational background, most participants had completed primary school (44.70%) or secondary school (19.10%), while 7.60% held a university degree or higher level of education. When analyzing

income levels, the majority of participants (58.90%) had an income ranging between 1,000 TRY and 15,000 TRY.

Table 2. Characteristics of Participants Included in the Study (n=450)

Variable	Group	n	%
Age	Mean±SD	71.02±5.77	–
Gender	Female	190	42.20
	Male	260	57.80
Marital Status	Single	14	3.10
	Divorced	18	4.00
	Widowed	78	17.30
	Married	340	75.60
Education Level	Illiterate	13	2.90
	Literate (no formal education)	24	5.30
	Primary School	201	44.70
	Middle School	86	19.10
	High School	89	19.80
	University	34	7.60
	Master's Degree	3	0.70
Income Level (TRY)	No Income	83	18.40
	1,000–15,000	265	58.90
	16,000–30,000	86	19.10
	31,000–50,000	14	3.10
	51,000–100,000	2	0.40

Table 3 presents the mean scores, Cronbach's alpha, and Omega reliability coefficients of the scales used in the study. Accordingly, the mean score for the Aging Perception Scale was calculated as 53.176 ± 5.633, while the Health Perception Scale had a mean score of 41.806 ± 6.283. The Perceived Usefulness of Information and Communication Technologies Scale recorded a mean score of 13.382 ± 9.376, whereas the Critical Health Literacy Scale had a mean score of 12.137 ± 5.895. The Cronbach's alpha and Omega reliability coefficients for all scales exceeded 0.70, indicating strong internal consistency. Based on the total mean scores, older adults generally perceived their aging (3.545) and health (3.380) at a moderate level of positivity. Additionally, participants' critical health literacy levels (3.034) were found to be moderate, whereas their perceived usefulness of information and communication technologies (3.345) was low.

Table 3. Self-perception of aging and health, Perceived Usefulness, Critical Health Literacy Scale Scores (n=450)

Scale/Sub-dimension	M	SD	Alfa	Omega
Aging Perception	53.176	5.633	0.764	0.862
Health Perception	41.806	6.283	0.737	0.856
Perceived Usefulness	13.382	9.376	0.988	0.961
Critical Health Literacy	12.137	5.895	0.953	0.985

Figure 1 presents the visualization findings of the correlation analyses between scale scores. A negative correlation coefficient indicates an inverse relationship, whereas a positive coefficient signifies a direct relationship. As the absolute value of this coefficient approaches 1, the strength of the relationship increases. According to the significance results, all scales exhibit positive and statistically significant relationships ($r>0$, $p<0.05$). A moderate positive correlation is observed between critical health literacy and perceived usefulness of information and communication technologies, whereas the relationships among other factors are positive but relatively weak.

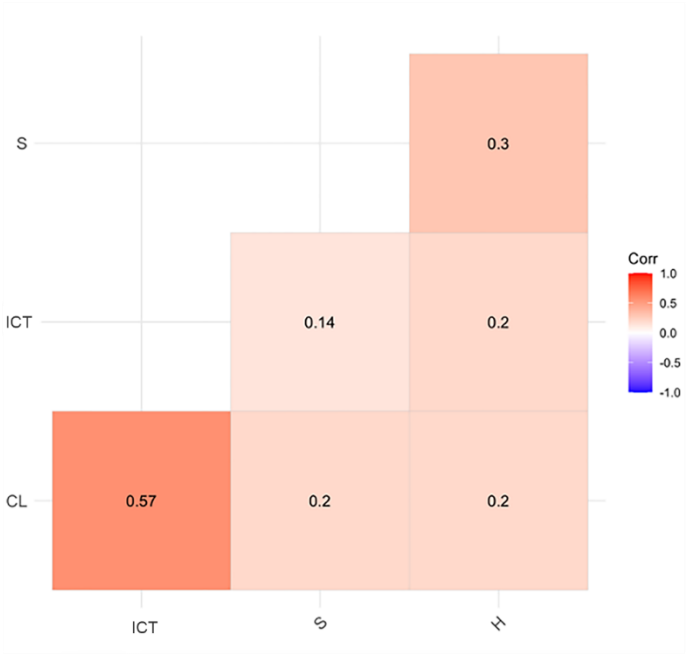

Figure 1. Correlation Graph of Self-Perceptions of Aging, Health, Perceived Usefulness, and Critical Health Literacy

S: Perception of Aging, H: Perception of Health, IT: Perceived Usefulness of Information and Communication Technologies, CL: Critical Health Literacy

Figure 2 presents the graphical representation of the path analysis results for the research model. In the graphical representations, only the path coefficients and causal/bidirectional relationships related to the theoretical model are symbolized. Detailed statistical data on path coefficients are provided in Table 4. In the first stage, the model fit of the path analysis was assessed based on fit indices. According to these indices, the Chi-square/df ratio is below 5, the CFI, GFI, TLI, and IFI values exceed 0.9, the AGFI results are above 0.85, and the RMSEA value is below 0.05.[23] Based on the fit indices obtained from the path analysis, the construct validity of the research model has been confirmed.

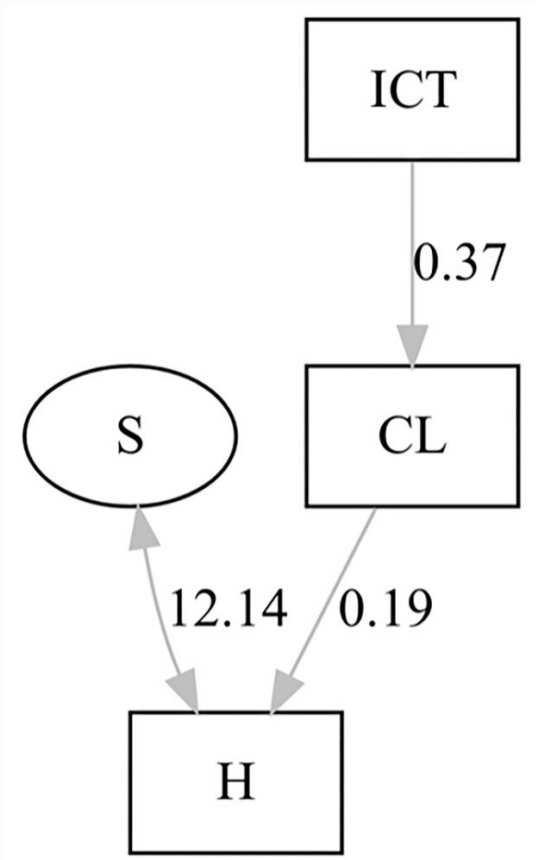

Figure 2. Path Analysis Diagram of the Research Model

S: Self-Perception of Aging, H: Self-Perception of Health, IT: Perceived Usefulness of Information and Communication Technologies, CL: Critical Health Literacy

Statistical evaluations were conducted based on the regression model and covariance results presented in Table 5. According to the covariance findings, there is a positive and statistically significant relationship

between self-perceptions of health and aging (B>0, p<0.05). Regression results indicate that older adults' perceived usefulness of information and communication technologies positively and significantly influences their levels of critical health literacy (B>0, p<0.05). Similarly, the critical health literacy levels among older individuals have a positive and statistically significant impact on their health perception (B>0, p<0.05). Based on the path analysis results, SPA and health perception in older adults will either increase or decrease simultaneously. In conclusion, as the perceived usefulness of information and communication technologies increases, critical health literacy levels are also expected to improve among older adults. Likewise, an increase in critical health literacy is expected to enhance health perception in this population.

Table 5. Regression Coefficients and Covariance Results for Path Analysis

Relationship	Path	B	SE	z	p	Std. β
Regression	ICT → CL	0.368	0.024	15.103	<0.001	0.586
Regression	CL → H	0.194	0.063	3.078	<0.001	0.143
Covariance	H ~~ S	12.143	2.204	5.509	<0.001	0.274

Perception of Aging (S), Health Perception (H), Perceived Usefulness of Information and Communication Technologies (ICT), Critical Health Literacy (CL), Unstandardized Path Coefficient (B), Standard Error (SE), and Standardized Path Coefficient (Std. β).

Tables 6 and 7 present the relationship between participants' sociodemographic characteristics and their self-perceptions of aging and health, perceived usefulness of ICTs, and critical health literacy. The study showed significant differences according to self-reported health status (p<0.05). Older adults who rated their health as very poor, poor, or fair reported more negative perceptions of aging and health, as well as lower levels of ICT usefulness and critical health literacy, compared to those who rated their health as good or very good.

Gender was also significantly associated with health perception (p<0.05); women reported more negative views about their health compared to men. Marital status had a significant relationship with critical health literacy (p<0.05); widowed respondents scored lower than those who were single, divorced, or married.

Furthermore, participants with higher education levels demonstrated more positive perceptions of both aging and health, while only those with higher income levels expressed more positive perceptions of health. Both education and income were positively associated with perceived ICT usefulness and critical health literacy.

Table 6. Relationships Between Sociodemographic Findings and Self-Perceptions of Aging and Health

Scales		Brief Aging Perception					Health Perception				
Variable	**Group**	**Mean**	**SD**	**Med**	**Min**	**Max**	**Mean**	**SD**	**Med**	**Min**	**Max**
Self-Reported Health	Very bad	50.727	3.319	50	47	57	47.182	6.478	47	37	60
	Bad	51.157	4.775	51	40	60	48.543	7.566	48	33	64
	Average	53.030	5.932	54	30	68	49.746	7.651	50	25	68
	Good	54.311	5.559	54	38	66	51.970	7.087	52	32	66
	Very good	54.364	4.891	55	43	62	57.000	11.141	61	39	72
	Test Statistic	20.646					23.812				
	p-value	**0.001**					**0.001**				
Gender	Female	53.126	5.793	54	30	68	49.268	8.071	49	25	71
	Male	53.192	5.509	54	33	66	51.738	7.852	51	32	72
	Test Statistic	24395					-3257				
	p-value	0.823					**0.001t**				
Marital Status	Single	53.286	6.132	54.5	42	64	49.000	10.612	46.5	34	64
	Divorced	55.000	4.472	55.5	45	62	50.389	6.946	48	42	69
	Widowed	51.846	6.073	51.5	30	68	49.192	8.608	48.5	33	72
	Married	53.365	5.519	54	33	66	51.126	7.810	51	25	72
	Test Statistic	7.770					6.381				
	p-value	0.051					0.094				
Education	Illiterate	51.231	5.102	50	44	62	46.923	4.89	46	40	56
	Literate	50.125	4.504	51	40	58	46.583	7.389	47	33	60
	Primary School	53.174	5.810	54	30	68	49.791	8.28	49	25	72
	Middle School	54.163	5.642	55	33	66	51.407	7.686	51	25	72
	High School	52.854	5.310	54	36	64	52.011	8.033	51	34	71
	University	54.441	5.327	55	45	66	54.794	6.304	55	44	68
	Master's Degree	51.333	7.767	49	45	60	54.667	7.572	58	46	60
	Test Statistic	16.565					4.237				
	p-value	**0.011**					**0.001F**				
Income Level	No Income	52.301	5.967	53	30	65	48.060	8.165	49	25	71
	1,000 TRY - 15,000 TRY	53.121	5.739	54	33	68	50.751	7.666	50	29	72
	16,000 TRY - 30,000 TRY	54.058	4.907	54	43	65	53.198	8.106	53	35	72
	31,000 TRY - 50,000 TRY	54.286	5.165	56	45	62	49.929	9.691	47	40	69
	51,000 TRY - 100,000 TRY	48.500	2.121	48.5	47	50	50.500	6.364	50.5	46	55
	Test Statistic	5.923					15.349				
	p-value	0.205					**0.004**				

Mean: Mean (Arithmetic Average), SD: Standard Deviation, Med: Median, Min: Minimum, Max: Maximum, KW: Kruskal-Wallis H Test, U: Mann-Whitney U Test, t: Independent Samples t-Test, F: Independent Samples ANOVA Test, p: Significance Value

Table 7. Relationships Between Sociodemographic Findings and Perceived Usefulness of ICT and Critical Health Literacy

Scales		Perceived Usefulness					Critical Health Literacy				
Variable	**Group**	**Mean**	**SD**	**Med**	**Min**	**Max**	**Mean**	**SD**	**Med**	**Min**	**Max**
Self-Reported Health	Very bad	7.909	8.769	4	4	28	9.545	6.861	4	4	20
	Bad	10.829	8.777	4	4	28	10.529	5.743	11.5	4	20
	Average	13.025	9.125	8	4	28	12.244	6.011	14	4	20
	Good	15.385	9.482	20	4	28	12.896	5.619	15	4	20
	Very good	14.606	10.124	10	4	28	12.667	5.737	16	4	20
	Test Statistic	18.267					10.218				
	p-value	**0.001**					**0.037**				
Gender	Female	13.753	9.070	16	4	28	11.984	5.768	14	4	20
	Male	13.112	9.601	8	4	28	12.25	5.994	15	4	20
	Test Statistic	25.486					23.624				
	p-value	0.546					0.422				
Marital Status	Single	12.214	9.141	9	4	28	15.071	5.03	16	4	20
	Divorced	15.722	7.706	20	4	24	14.889	3.359	16	8	20
	Widowed	11.128	8.758	4	4	28	10.372	6.148	10	4	20
	Married	13.824	9.545	16	4	28	12.276	5.866	14	4	20
	Test Statistic	5.892					12.09				
	p-value	0.117					**0.007**				
Education	Illiterate	4.000	0.000	4	4	4	9.846	6.866	4	4	20
	Literate	6.875	5.788	4	4	20	8.083	5.258	4	4	20
	Primary School	10.726	8.795	4	4	28	10.687	5.966	12	4	20
	Middle School	14.488	9.350	20	4	28	12.744	5.323	15	4	20
	High School	19.348	8.079	22	4	28	15.011	4.976	16	4	20
	University	18.000	8.068	20	4	28	15.353	4.148	16	4	20
	Master's Degree	23.000	5.000	23	18	28	12.667	7.767	15	4	19
	Test Statistic	83.767					57.020				
	p-value	**0.001**					**0.001**				
Income Level	No Income	7.952	7.117	4	4	24	8.614	5.342	4	4	20
	1,000 TRY - 15,000 TRY	12.826	9.495	8	4	28	12.245	5.989	15	4	20
	16,000 TRY - 30,000 TRY	19.337	7.492	20	4	28	14.581	4.651	16	4	20
	31,000 TRY - 50,000 TRY	18.857	6.200	20	4	28	15.714	3.384	16	8	20
	51,000 TRY - 100,000 TRY	18.000	14.142	18	8	28	14.000	8.485	14	8	20
	Test Statistic	64.215					47.198				
	p-value	**0.001**					**0.001**				

Mean: Mean (Arithmetic Average), SD: Standard Deviation, Med: Median, Min: Minimum, Max: Maximum, KW: Kruskal-Wallis H Test, U: Mann-Whitney U Test, t: Independent Samples t-Test, F: Independent Samples ANOVA Test, p: Significance Value

Discussion

This study examined the underlying factors influencing how Turkish older adults perceive aging and health, highlighting the roles of sociodemographic characteristics, critical health literacy, and the perceived usefulness of ICTs. According to the results, older participants' perceptions of aging (53.176±5.633) were found to be moderately high, their health perceptions (41.806±6.283) were moderate, their perceived usefulness of ICT (13.382±9.376) was low, and their critical health literacy (12.137±5.895) was at a moderate level. These findings suggest that older adults perceive their aging more positively than their health, yet all dimensions have room for improvement. The results align with previous studies that indicate Turkish older adults generally have moderate to low levels of aging perception.[24]

While these general patterns provide a useful overview, a closer look at critical health literacy reveals important nuances for older adults. Our results for critical health literacy and health perception are consistent with previous studies reporting moderate levels.[10] These discrepancies may reflect differences in how health literacy is defined or regional diversity. In addition, rural living increases social and health inequalities, which may explain varied findings on health literacy and aging perceptions.[25]

In parallel to limited health literacy, our findings also point to the perceived usefulness of ICT being low among older adults. Early research indicates that older adults' acceptance and intention to use ICT are influenced by multiple factors, including sociodemographic mediators, perceived usefulness, security, attitudes, subjective norms, perceived behavioral control, and emotions.[26] Accordingly, the low perceived usefulness observed in our study may be due to the interaction of these factors.

Beyond health literacy and perceived usefulness, both correlation and path analysis results showed a positive association between older adults' self-perceptions of aging and health ($r > 0$, $p < .05$; $B > 0$, $p < .05$). Nevertheless, improving aging and health perceptions may enhance older adults' quality of life and health outcomes. Unlike previous studies, which have generally studied aging and health perceptions separately, our study makes a novel contribution by examining the interrelations among these perceptions. [4,9]

Our path analysis further clarifies how the perceived usefulness of ICTs may enhance broader health-related decision-making capacities, including critical health literacy. In this regard, path analysis first showed that the perceived usefulness of ICTs had a positive effect on critical health literacy ($B > 0$, $p < 0.05$). This finding supports previous studies suggesting that individuals with lower health literacy levels are less likely to use and perceive health information technologies as useful.[27] These findings are important to understanding the interaction between technology benefit perception and critical health literacy in later life.

According to the other path analysis findings, older adults' critical health literacy levels have a positive effect on their health perceptions (B >0, p<0.05). This finding is consistent with previous studies conducted among older adults in Turkey[10] and broader adult populations.[12] This finding suggests that critical health literacy has a crucial impact on accessing and evaluating health information and shaping individuals' perceptions of health. All these findings from the path analysis revealed that there is a bidirectional relationship between aging and the health perceptions among older people.

Even though perceived usefulness and critical health literacy are personal determinants of shaping perceptions, these are deeply intertwined with structural conditions, particularly sociodemographic characteristics, including income, education, and gender inequality. Our findings revealed that as the older adults' education and income levels increased, their perceptions of health and aging became more positive (p<0.05). This pattern aligns with previous research, which shows that higher education is associated with more positive perceptions of aging.[24] These findings reinforce the key role of income and educational resources in constructing positive aging and health perception among older adults.

In addition to income and education, gender differences are also determinants of health perceptions in older adults. In this matter, older women reported more negative health perceptions than men (p<0.05). This finding supports earlier studies showing that being female is associated with more negative subjective health perceptions.[28] Therefore, there may be a need for women-specific interventions to improve older women's perceptions of health.

Along with health and aging perception, we also explored whether sociodemographic factors contribute to the perceived usefulness of ICTs and critical health literacy among older adults. Our study found that as education and income levels rise, older adults tend to perceive ICTs as more useful. This finding is consistent with Chen and Chan, who found that older individuals with better economic conditions are more likely to use age-related technologies.[29] In contrast, the gender and marital status of the participants did not create a statistically significant difference in the perceived usefulness of ICT.

Likewise, income and educational status emerge as dominant predictors of critical health literacy among older adults. Higher income and education levels are significantly associated with increased critical health literacy (p<0.05). Beauchamp et. al. also found that lower levels of education are associated with lower levels of health literacy.[30] All these results indicate that income and educational status are key sociodemographic determinants for older people.

Limitations and Further Research

This study has some limitations. First, its cross-sectional design restricts causal inference, and the temporal order of variables should be tested in future longitudinal research. Second, as the sample was limited to older adults in Istanbul, the findings may not reflect rural populations, limiting generalizability. Third, the reliance on self-reports may have introduced bias. Future studies should include longitudinal designs, qualitative follow-ups, and intervention trials to improve digital literacy among older adults.

In conclusion, our findings show that disadvantages in older age are relational and cumulative, shaped by perceptual, technological, informational, and socioeconomic factors. SPAH are strong indicators of quality of life and well-being and should be used to evaluate social policies and inequalities. In practice, this calls for integrating technology education into community-based programs to boost digital participation and reduce inequalities. Health professionals can also use these perceptions in their interventions. Such efforts require coordination between the Ministry of Health and the Ministry of Family and Social Services.

Ethical Considerations: This study received ethical approval from the Galatasaray University Scientific Research and Publication Ethics Committee during its meeting on 06.07.2023, under decision number 01 of protocol code 2023/017. All participants were provided with detailed information about the study and consented through a voluntary consent form.

Conflict of Interest: The authors declare no conflict of interest.

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