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RESEARCH ARTICLE

RISK AWARENESS AND PROTECTIVE BEHAVIORS OF COMMUNICABLE DISEASES AMONG ADULTS IN TÜRKİYE: A CROSS-SECTIONAL STUDY

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ABSTRACT

Purpose: This study aimed to assess risk awareness and protective behaviors against communicable diseases among adults in Kayseri, Türkiye.
Material and Methods: A descriptive cross-sectional study was conducted in January 2023 with 293 individuals aged 18 and over, recruited from four central Family Health Centers. Data were collected using the Communicable Diseases Risk Awareness and Protective Behaviors Scale and a demographic information form. Analyses were performed with SPSS and RStudio.
Results: The average CDRAPS score was 143.7±19.1. The lowest scores were in “Common Life Risk Awareness,” and the highest in “Personal Contagion Awareness.” Women, individuals aged 50 and older, and urban residents showed significantly higher awareness and protective behavior levels. Educational level had no significant impact.
Conclusion: Although overall awareness was high, gaps remain in recognizing risks in communal environments. Targeted public health strategies that consider factors such as age, gender, and place of residence are needed to enhance disease prevention efforts.

Keywords: Communicable disease, disease awareness, public health, protective behavior, health promotion

INTRODUCTION

Communicable diseases (CD) pose a significant threat to global health, causing illness, disability, and mortality on both societal and worldwide scales (1). Sustainable Development Goal 3 targets the elimination of epidemics like AIDS, tuberculosis, and malaria by 2030, emphasizing the urgency to address all CD, including lower respiratory tract infections, which are identified as the world's fourth leading cause of death (2).

In Türkiye, there has been an increase in CD-related fatalities, particularly due to lower respiratory tract infections, observed between 2018 and 2019. The COVID-19 pandemic has further exacerbated this trend, making CD the second leading cause of death in the country (3). The link between CDs and climatic conditions, amplified by the effects of global warming, highlights the growing need to understand and mitigate CD risks. Additionally, globalization and increased mobility through migration and travel have accelerated both the emergence and transmission of infectious diseases (4).

A fundamental approach to combating CDs involves interrupting the chain of transmission between infected and susceptible individuals (5). The specific measures required depend on the transmission route of each disease. Personal precautions—such as wearing masks, practicing hand hygiene, and using condoms—play a pivotal role in disrupting this transmission chain (6). Rising human interaction and population density have further facilitated the rapid spread of CDs, underscoring the importance of personal preventive measures in controlling disease transmission (7). While community-level policies and regulations are sometimes necessary, the core principle remains preventing contact between infected and healthy individuals. Within this framework, individual risk awareness and engagement in protective behaviors are crucial not only for personal health but also for broader public health efforts.

Awareness of CD risks and adherence to protective behaviors vary based on socio-demographic factors, socio-cultural context, technological accessibility, and personal experiences (8). Understanding public awareness and behavior is therefore essential for developing effective, community-based infectious disease prevention strategies. Türkiye continues to prioritize combating CDs, with the 2023 Sustainable Development Report showing moderate progress toward national health goals (9). Kayseri, a city in Central Anatolia with a population of 1,441,523, shares demographic characteristics representative of Türkiye as a whole (3). Despite ongoing initiatives, persistent challenges underscore the need for continuous evaluation and intervention.

Although previous studies in Türkiye and comparable countries have investigated risk awareness and protective behaviors related to specific diseases or transmission routes (10), comprehensive assessments that examine awareness and behaviors across multiple transmission pathways in a single representative adult population remain limited. Most existing research tends to focus on either a single disease (e.g., COVID-19 or tuberculosis) or target group (e.g., healthcare workers or students), limiting generalizability. This study seeks to address this gap by providing a broad, integrated assessment of both risk awareness and protective behaviors related to CD in the general adult population of Kayseri—a city demographically reflective of the national context. By doing so, the study aims to offer new insights into public health preparedness and contribute to the development of more inclusive, data-driven strategies for managing CD risks.

METHOD

This descriptive cross-sectional study was conducted among individuals aged 18 years and older residing in four central districts of Kayseri, Türkiye. From each district, one Family Health Center (FHC) was selected. Data were collected in January 2023 using a non-probability convenience sampling method. Intern doctors administered the surveys to individuals visiting the FHCs. Although this sampling method facilitated data collection, it poses limitations in terms of the generalizability of the findings, which should be considered when interpreting the results.

The required sample size for this study was calculated using the G*Power 3.1 program. A two-tailed power analysis was performed under the test family of z-tests using the “Proportions: Different from constant (binomial test)” option. The following parameters were used: $\alpha = 0.05$, power $(1–\beta) = 0.80$, and a low effect size of 0.1 (Cohen’s h), which is conventionally accepted as indicating a small effect. Since no previous studies using this scale were available in the literature, and the expected proportion of awareness in the population was unknown, the knowledge level was conservatively assumed to be 50%. This value represents the point of maximum variance, making it a standard and cautious choice when estimating proportions in the absence of prior data. Based on these assumptions, the minimum required sample size was calculated to be 199 individuals. To improve statistical power and account for possible data loss, it was aimed to include at least 300 literate volunteers with no hearing impairments or acute psychiatric conditions. Data collection was completed with 293 participants.

Data were gathered using two tools: a "Demographic Information Form" and the "Communicable Diseases Risk Awareness and Protective Behaviors Scale (CDRAPS)," developed by Ener, Seyfeli, and Çetinkaya (6). CDRAPS includes 36 items across six subdimensions: Common Life Risk Awareness, Self-Protective Awareness, Protective Behaviors, Handwashing Behaviors, Social Protective

Awareness, and Personal Contagion Awareness. The scale does not have a cutoff point; higher scores indicate greater awareness and more protective behavior regarding CD, with total scores ranging from 36 to 180. As a result of the exploratory factor analysis (EFA) conducted on the scale, the six-factor structure accounts for 45.21% of the total variance. A high percentage of explained variance is interpreted as an indicator of how well the relevant concept or construct is measured. The Cronbach's Alpha reliability coefficients of the scale are above 0.80, and the Spearman-Brown split-half reliability coefficients are above 0.70. This indicates that the scale has a high level of reliability. In the confirmatory factor analysis (CFA) model established to ensure the construct validity of the dimensions in the scale, the RMSEA value being 0.049 indicates a good fit. Since the CDRAPS is a newly developed instrument, to our knowledge, it has not yet been applied in other published studies. Therefore, this study also contributes to the literature by providing initial data on the scale's performance in a broader adult population.

Data were analyzed using SPSS version 25. Descriptive statistics were used for demographic variables. Before performing parametric tests, data were assessed for normality using the Kolmogorov–Smirnov test and skewness–kurtosis values; results indicated approximate normal distribution. Therefore, independent sample t-tests and one-way ANOVA were used for group comparisons. The Tukey test was used as a post-hoc analysis. In addition, effect size calculations related to group differences were performed using the R programming language in the RStudio environment (version RStudio 2023.09.1+494). For comparisons between two independent groups, Cohen's d was calculated and reported along with the corresponding 95% confidence intervals. The effsize package (version 0.8.1) was used for these analyses. For multiple group comparisons (one-way ANOVA), Eta squared (η^2) was calculated as the measure of effect size. The effectsize package (version 0.8.6) was used for this analysis. Cohen's d and Eta squared values were reported to indicate the magnitude of the difference and the proportion of variance explained, respectively. According to Cohen, d values of 0.2, 0.5, and 0.8 are considered small, medium, and large effects, respectively; for Eta squared, values of 0.01, 0.06, and 0.14 are considered to represent small, medium, and large effects. A 95% confidence level was used, and p-values <0.05 were considered statistically significant.

The survey was administered face-to-face by trained intern doctors, who received prior instruction on standardized questionnaire administration to reduce interviewer bias. All participants were informed about the purpose of the study and provided verbal and written informed consent before participation. Ethical approval was obtained from the Erciyes University Clinical Research Ethics Committee (Decision number: 2022/796, date: 07/12/2022). Participation was voluntary, and no incentives were provided. The study received no financial support, and the authors declare no conflicts of interest. The response rate was approximately 97.6%, with seven individuals declining to participate. Missing data were minimal (<2%) and were excluded using listwise deletion.

RESULTS

The study group consists of 293 individuals, including 163 males and 130 females. The mean age of the group is 33.9±12.8. (Table 1).

CDRAPS score mean of the group is 143.7±19.1 out of 180. There was no significant difference between the total scale score averages in terms of educational status, economic status, being a healthcare worker, having a healthcare worker in the family, having any chronic disease, and owning a pet (Table 1). Among the independent variables found to be significant (gender, age, marital status, and place of residence), multivariate linear regression analysis revealed that gender, marital status, and place of residence were significantly associated with the total CDRAPS score. The lowest score is in the "Common Life Risk Awareness" dimension, and the highest score is in the "Personal Contagion Awareness" dimension (Table 2).

When the score averages were evaluated according to gender, except for the protective behavior subscale, the total and subscale score averages were significantly higher in women than in men (Table 3).

When looking at the average scores according to age, the total score and the sub-dimensions of common life risk awareness, protective behaviors, and social protective awareness are higher in the group aged 50 and over (Table 4).

The total score and the scores for protective behavior and personal contagion awareness sub-dimensions are significantly higher in those living in urban areas compared to those living in rural areas (Table 5).

Table 1. Distribution of total scores according to sociodemographic characteristics of the study group

	n, %	Mean± SD	t, F	Cohen's d, Eta squared	Confidence Interval	p
All group	293	143.7±19.1				
Gender						
Male	163 (% 55.6)	140.43±18.77	3.306[a]	0.389	[0.16, 0.62]	0.001
Female	130 (% 44.4)	147.73±18.79				
Age						
18-24	94 (% 32.1)	139.65±18.01	3.634[b]	0.020	[0.00, 1.00]	0.028
25-49	159 (% 54.2)	144.88±18.77				
50 and over	40 (% 13.7)	148.30±21.50				
Marital status						
Married	130 (% 44.4)	148.32±19.45	3.804[a]	-0.447	[-0.68, -0.21]	<0.001
Single	163 (% 55.6)	139.96±18.02				
Children status						
Yes	124 (% 42.5)	148.21±19.40	3.633[a]	0.430	[0.19, 0.67]	<0.001
No	168 (% 57.5)	140.17±18.14				
Place of residence						
Urban	235 (% 80.2)	144.82±18.38	2.094[a]	0.307	[0.02, 0.60]	0.037
Rural	58 (% 19.8)	139.00±21.31				
Health worker status						
Yes	36 (% 12.3)	146.11±19.01	0.816[a]	0.145	[-0.21, 0.50]	0.415
No	257 (% 87.7)	143.33±19.12				
Having a chronic disease						
Yes	52 (% 17.7)	144.94±19.57	0.527[a]	0.081	[-0.22, 0.38]	0.599
No	241 (% 82.3)	143.40±19.02				
Having a pet animal						
Yes	69 (% 23.5)	143.34±19.66	0.163[a]	0.022	[-0.25, 0.29]	0.871
No	224 (% 76.5)	143.77±18.96				

Superscript symbols indicate the statistical test used for each comparison: [a] refers to independent samples *t*-tests; [b] refers to one-way ANOVA (*F* test) results applied to comparisons involving more than two groups. *Cohen's d* is reported only for comparisons analyzed with *t*-tests, whereas *eta squared* is presented for variables assessed via ANOVA.

Table 2. Total and sub-dimension scores of the study group

Total and subscale scores (n=293)	Mean ± SD	Min-Max
Total score	143.7±19.1	36-180
Subscales		
Awareness score		
Common life risk awareness	32.0±7.6	9-45
Self protective awareness	33.0±4.3	8-40
Social protective awareness	16.5±2.7	4-20
Personal contagion awareness	17.4±2.2	4-20
Behaviors score		
Protective behaviors	32.0±4.9	8-40
Handwashing behaviors	12.8±2.1	3-15

Table 3. Total and subscale scores by gender in the study group

Scores	Gender		t	p
	Male (n=163)	Female (n=130)		
Total score	140.43±18.77	147.73±18.79	3.306	0.001
Subscales				
Awareness score	**96.45±13.42**	**101.98±13.68**	**3.473**	**0.001**
Common life risk awareness	31.16±7.61	33.07±7.56	2.141	0.033
Self protective awareness	32.11±4.31	34.17±4.11	4.158	<0.001
Social protective awareness	16.15±2.75	16.90±2.66	2.319	0.021
Personal contagion awareness	17.01±2.30	17.83±2.09	3.119	0.002
Behaviors score	**43.98±6.35**	**45.75±6.01**	**2.428**	**0.016**
Protective behaviors	31.52±5.01	32.55±4.70	1.799	0.073
Handwashing behaviors	12.46±2.23	13.20±1.93	3.039	0.003

Table 4. Total and subscale scores according to age in the study group

Scores	Age			F	p
	18-24 (n=94)	25-49 (n=159)	50 and order (n=40)		
Total score	139.65±18.01[a]	144.88±18.77[ab]	148.30±21.50[b]	3.634	0.028
Subscales					
Awareness score	**96.07±13.23[a]**	**99.55±13.45[ab]**	**103.0±15.37[b]**	**3.996**	**0.019**
Common life risk awareness	30.09±7.58[a]	32.54± 7.35[b]	34.40±8.03[b]	5.465	0.005
Self protective awareness	32.36±4,43	33.24±4.23	33.72±4.46	1.831	0.162
Social protective awareness	16.48±2.67[ab]	16.18±2.80[a]	17.67±2.29[b]	4.841	0.009
Personal contagion awareness	17.12±2.19	17.57±2.13	17.20±2.73	1.306	0.273
Behaviors score	**43.58±5.85**	**45.33±6.27**	**45.30±6.87**	**2.497**	**0.084**
Protective behaviors	30.94±4.71[a]	32,43±4,80[b]	32,60±5,41[ab]	3.140	0.045
Handwashing behaviors	12.63±2.13	12.89±2.13	12.70±2.16	0.480	0.619

According to the Tukey post-hoc test, age groups sharing the same superscript letter do not differ significantly. Groups with different letter(s) indicate a statistically significant difference at the $p < 0.05$ level. A group with a two-letter superscript (e.g., [ab]) does not differ significantly from groups sharing either of those letters.

Table 5. Total and subscale scores of the study group according to their place of residence

Scores	Place		t	p
	Urban (n=235)	Rural (n=58)		
Total score	144.82±18.38	139.00±21.31	2.094	0.037
Subscales				
Awareness score	**99.52±13.55**	**96.41±14.59**	**291**	**0.124**
Common life risk awareness	32.15±7.70	31.44±7.40	0.629	0.530
Self protective awareness	33.25±4.19	32.08±4.83	1.850	0.065
Social protective awareness	16.58±2.66	16.10±2.98	1.196	0.232
Personal contagion awareness	17.52±2.13	16.77±2.60	2.298	0.022
Behaviors score	**45.30±5.80**	**42.58±7.52**	**2.572**	**0.012**
Protective behaviors	32.40±4.54	30.24±5.85	3.061	0.002
Handwashing behaviors	12.89±2.04	12.34±2.41	1.775	0.077

When the average scores were evaluated according to the level of education as primary education, high school, and higher education, no significant difference was found between the total and sub-dimension scores based on the level of education.

When analyzing the responses from the research group, the predominant protective measures participants reported against CD are as follows: 98.7% stated, "I wash my hands with soap after using the toilet"; 94.5% believe that having multiple sexual partners increases the risk of disease transmission; and 89.1% indicated, "I wash my hands with soap upon returning home from outside."

The least recognized avoidance behaviors among participants included feeling uneasy about consuming meat products in out-of-home settings like restaurants and cafeterias (35.9%), paying attention to the presence of ear tags on stray dogs (44.7%), and avoiding places like hot springs, baths, and swimming pools due to potential disease transmission concerns (47.7%).

DISCUSSION

This study aimed to assess adults' awareness and protective behaviors regarding a broad range of CD. Data collected from 293 adults revealed that overall awareness, as measured by the CDRAPS, was above average (mean score: 143.7/180). Among the subdimensions, the lowest scores were recorded in Common Life Risk Awareness, while the highest were in Personal Contagion Awareness, suggesting that individuals are more alert to personal risk but may underestimate environmental or communal risks.

To our knowledge, no previous study in the literature has comprehensively evaluated awareness and protective behaviors across all major transmission routes of CD. Therefore, our comparisons rely on disease-specific or behavior-focused studies. For example, Li et al. (11) and Jones & Salathé (12) demonstrated increased awareness during COVID-19 and influenza outbreaks, largely influenced by public attention and media campaigns. Ergün et al.'s study involving 160 emergency healthcare personnel revealed an above-average level of knowledge about COVID-19 following the outbreak (13). Contrasting with our findings, Roy et al.'s study in India with 662 participants reported a moderate level of knowledge about COVID-19 infection and prevention (14). These studies, however, focused on a single disease during a crisis period, potentially explaining their higher awareness scores. Our findings, collected post-COVID-19, reflect broader and more stable attitudes toward infectious disease risk in general.

Gender-based analysis revealed that women scored significantly higher in CD awareness and protective behavior, consistent with previous research (15–18). De Zwart and colleagues' international study on SARS also indicated that women had higher awareness regarding SARS (15). In a study conducted by Cui and colleagues in a province of China, which examined avian influenza awareness, knowledge, and protective behaviors among poultry farmers, it was found that women had higher awareness of avian influenza compared to men (16). Ibuka et al.'s study evaluating individuals' awareness about H1N1 flu in the USA showed that women had a higher awareness (17). In the study conducted by Linares et al., which investigated the awareness of Covid-19, women exhibited significantly higher levels of awareness compared to men (18). While earlier studies often attribute this difference to women's traditional roles in family health and hygiene, a deeper perspective should also consider psychological and sociocultural factors. Women tend to utilize healthcare services more frequently, engage more in health-seeking behaviors, and may perceive health risks differently due to caregiving roles and social expectations.

Participants aged 50 and above showed significantly higher scores, especially in Common Life Risk Awareness, Protective Behaviors, and Social Protective Awareness. This aligns with previous findings (16, 19). Cui et al.'s study among poultry farmers in China demonstrated that perceived self-efficacy in controlling avian influenza was positively correlated with age, indicating increased confidence with older age in managing disease risks (16). Similarly, Fang et al., in their study on bird flu risk perception and risk reduction, found that age significantly influences higher bird flu risk perceptions, with the elderly showing heightened risk awareness (19). Although age was not found to be a significant predictor of the total CDRAPS score in the multivariate linear regression analysis, these findings suggest that older adults' heightened awareness and protective behaviors may be influenced by accumulated life experience, greater health-related knowledge, and a stronger sense of social responsibility.

Our study also highlights differences in awareness and perception of infectious disease risks between individuals living in urban and rural areas, emphasizing the influence of environmental and social factors on public health.Our findings indicate that individuals residing in urban areas exhibit significantly higher levels of awareness and engagement in protective behaviors related to CD. This disparity may be attributed to several structural and informational advantages present in urban settings. Urban residents generally benefit from easier access to healthcare services, more frequent interactions with healthcare professionals, and greater exposure to health education through both formal (schools, institutions) and informal (media, social networks) channels. Additionally, public health campaigns tend to be more concentrated and visible in urban areas, further reinforcing awareness. In contrast, Barr et al.'s study in Australia revealed that rural residents, despite infrastructural limitations, showed heightened awareness of influenza, possibly due to a stronger perception of vulnerability and a greater sense of self-reliance (20). These contrasting findings suggest that place of residence interacts with a variety of factors—including accessibility, exposure, perceived risk, and social context—that jointly influence CD awareness. Therefore, interventions aiming to increase awareness should be tailored to the specific needs and barriers of both urban and rural populations.

In our study, participants who had children were found to have higher average CDRAPS scores, indicating greater awareness of CD risks. This finding aligns with several studies suggesting that having children in the household may increase individuals' exposure to health information and encourage more cautious, preventive behaviors. For example, Schwarzinger et al. found that parents demonstrated greater acceptance of the A/H1N1 vaccine compared to childless adults, with acceptability increasing in relation to both the number of children and perceived disease severity (21). Such findings suggest that parental responsibility may heighten individuals' perceived accountability for protecting not only themselves but also their families. However, the literature on this topic is not entirely consistent. Janowski et al.'s study in the United States revealed that individuals without children perceived a higher personal risk of SARS-CoV-2 infection than those with children (22). This counterintuitive result may be attributed to a form of optimism bias or a sense of control within the family environment, wherein parents perceive themselves as taking more precautions and therefore at lower risk. Similarly, Commodari's study found no significant association between having children and influenza risk perception (23), which might reflect variations in disease type, cultural context, or measurement tools used across studies.These conflicting findings highlight that the relationship between parental status and infectious disease awareness is likely multifaceted. Factors such as the age of children, prior health experiences, access to pediatric healthcare services, and psychological variables (e.g., perceived control, anxiety levels) may mediate how having children influences awareness. Future studies would benefit from a more nuanced approach that considers these moderating factors when exploring how family structure affects health-related behaviors and perceptions.

The relationship between individuals' education level and perceived risk of CD remains ambiguous. Although it is generally assumed that higher education is associated with increased health awareness, our study found no significant differences in total or sub-dimension scores of the CDRAPS based on educational status. This finding contrasts with several studies in the literature. For instance, Fang et al. reported that individuals with higher education levels demonstrated greater risk perception regarding avian influenza, likely due to better access to scientific information and health literacy (19). Conversely, Commodari's study found that individuals with lower educational attainment exhibited higher influenza risk perception scores, which may be attributed to heightened vulnerability or anxiety due to limited understanding and reduced access to reliable information (23). Similarly, Tagini et al. observed that lower education levels were associated with increased perceived risk of respiratory CD (24).

These contradictory findings suggest that the relationship between education and risk perception is not linear and may be influenced by a variety of mediating factors. Cultural context plays a critical role—educational systems differ across countries in how they address health education, and the societal value placed on formal education varies. Moreover, the type of disease, public salience, and recent experiences (such as pandemics) can influence whether higher education leads to heightened awareness or reduced perceived vulnerability due to overconfidence. Additionally, individuals with lower education levels may rely more on community knowledge, traditional beliefs, or past experiences, which can either amplify or distort risk perceptions. Therefore, the impact of education on disease awareness should be interpreted within a broader sociocultural and psychological framework, considering not just the number of years of education but also its content, relevance, and the individual's engagement with health-related information.

In our study, participants most commonly reported engaging in hand hygiene practices to protect themselves from CD. Specifically, 98.7% reported washing their hands with soap after using the toilet, and 89.1% upon returning home from outside. These high engagement rates are consistent with a national study in Türkiye, where 91.1% of participants reported post-toilet handwashing and 78% acknowledged handwashing as a critical preventive behavior (25). Likewise, a study by Tanrıverdi and Salcan among medical faculty students revealed that handwashing frequency significantly increased during the COVID-19 pandemic, underscoring the influence of large-scale public health messaging (26). The widespread practice of hand hygiene in our sample likely reflects the cumulative effect of pandemic-era campaigns, high media exposure, and the simplicity and accessibility of the behavior itself. Handwashing is an individual, low-cost, and culturally normalized habit that requires minimal resources and effort, making it easier to adopt consistently.Supporting evidence from Korea also confirms that individuals exposed to hand hygiene training or public messaging exhibited significantly higher frequencies of handwashing and use of soap or disinfectant (27). These findings emphasize the effectiveness of structured health communication and educational outreach in shaping daily health behaviors.

However, our study also revealed that some protective behaviors were less commonly recognized, particularly those involving communal or shared environments. For instance, only 47.7% of participants identified communal areas such as pools, spas, and public baths as potential transmission hotspots for CD. This indicates a significant gap in risk perception related to indirect or environmental exposure routes. Although such spaces are widely acknowledged in the scientific literature as high-risk environments when hygiene measures are neglected, public awareness appears insufficient. Studies on swimming pool behavior reinforce this concern. Research shows widespread disregard for hygiene regulations in these settings (28, 29). In a multicenter study by Pasquarella et al. in Italy, 41.7% of participants admitted they never read the swimming pool rules. While 70.9% reported showering before entering the pool, 13.5% acknowledged urinating in the pool at least once, and only 93.9% consistently wore appropriate footwear (30). These behaviors suggest not only a lack of awareness but also a normalization of risk-taking in public recreational spaces. This contrast between highly practiced behaviors (e.g., handwashing) and overlooked risks (e.g., in shared public environments) highlights a crucial issue in public health education: generic messaging may increase basic hygiene compliance, but without targeted, context-specific education, other important risk domains may be neglected. Therefore, future awareness campaigns should broaden their scope to include behaviors related to communal environments, especially those perceived as safe or routine. Enhancing public understanding of disease transmission in such settings is essential for comprehensive CD prevention.

This study has several limitations. First, the use of a non-probability convenience sampling method limits the generalizability of findings. Participants were recruited from family health centers, potentially excluding individuals who do not regularly access healthcare services. Second, while the CDRAPS scale showed good internal consistency, it is a newly developed tool, and further validation studies in diverse populations are needed. Third, self-reported data may be subject to social desirability bias, especially concerning hygienic practices like handwashing. Fourth, environmental and structural factors influencing behaviors—such as access to soap, clean water, or health communication—were not assessed. Lastly, this cross-sectional design captures a single time point and does not reflect changes in awareness or behavior over time.

CONCLUSIONS

In conclusion, while the general level of awareness and engagement in protective behaviors against CD was found to be relatively high among adults in this study, important gaps remain—particularly in recognizing risks associated with communal environments such as public baths, pools, and spas. The lowest scores were observed in the Common Life Risk Awareness subdimension, whereas the highest scores were related to Personal Contagion Awareness, indicating that while individuals tend to be vigilant about personal risk, they may underestimate environmental or community-level transmission pathways.

Key socio-demographic factors—including gender, age, marital status, parenthood, and place of residence—were found to significantly influence awareness and behaviors. These findings highlight the need for tailored public health interventions that address specific population segments. For instance, targeted educational campaigns can be developed to increase awareness in younger individuals and rural populations, who may have lower access to health information. Moreover, gender-sensitive strategies may be beneficial, recognizing the consistently higher awareness levels observed among women.

To bridge awareness gaps regarding shared public spaces, context-specific health promotion efforts should be prioritized. These could include hygiene signage in communal facilities, community outreach programs, and media campaigns emphasizing the risks of indirect transmission in high-contact environments. Integrating these messages into school curricula, public service announcements, and primary care consultations can help normalize preventive behaviors beyond individual hygiene.

From a policy perspective, these findings support the development of risk communication frameworks that go beyond generic messaging and account for socio-cultural and environmental determinants of health behavior. Public health authorities should also consider the use of behavioral insights to design interventions that are both evidence-based and socially resonant.

In summary, this study offers valuable evidence for refining national and local health promotion strategies and underscores the importance of targeted, culturally informed, and behaviorally grounded approaches to CD prevention.

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