

RESEARCH

Open Access



The effects of emotional contagion on fear of contagion/ transmission in communicable diseases: emotional epidemic

Bahar Kefeli Çol^{1*} , Ayşe Gümüşler Başaran² , Burcu Genç Köse² , Emine Bakoğlu³ and Kazım Şahin⁴

Abstract

Purpose Emotional contagion, which is known as individuals unknowingly experiencing similar emotions, may cause fear of contagion and transmission in the presence of communicable diseases. This study aimed to evaluate the effect of emotional contagion on the fear of contracting or transmitting communicable diseases.

Method This study employed a mixed-methods approach, conducted in December 2022. The quantitative dimension of the study was completed with 509 students, and the qualitative dimension with 49 university students. Data were collected with emotional contagion and fear of contagion/transmission scales. Pearson Correlation and linear regression were used to analyze quantitative data. Qualitative data were analyzed using descriptive analysis.

Results The mean score of the emotional contagion scale was 2.96 ± 0.49 , and the mean score of the fear of contagion/transmission scale was 89.65 ± 16.58 . A weak positive correlation was found between emotional contagion and fear of contamination. It was found that emotional contagion predicts fear of infection/transmission at a statistically significant level, though with a low effect size ($r = 0.29$). A total of 16 main themes were reached in the qualitative dimension of the study. The themes were as follows: fear, a compulsory process, taking precautions, danger to society, not finding it scary, disruption in social life, importance of hygiene, maintaining social distance, use of masks, strengthening immunity, negative psychological impact, negative social impact, negative physical impact, turning to positive thoughts, uneasiness, fear of the future and a normal process.

Conclusion This study highlights the significance of emotional contagion in shaping the fear of contracting communicable diseases.

Keywords Communicable disease, Fear of transmission, Emotional transmission, Fear of being infected

*Correspondence:

Bahar Kefeli Çol
bahar.kefelicol@erdogan.edu.tr

¹Recep Tayyip Erdoğan University Güneşu School of Physical Therapy and Rehabilitation, Rize, Türkiye

²Recep Tayyip Erdoğan University Faculty of Health Sciences, Rize, Türkiye

³Recep Tayyip Erdoğan University Vocational School of Health Services, Rize, Türkiye

⁴Recep Tayyip Erdoğan University Faculty of Medicine, Rize, Türkiye



© The Author(s) 2026. **Open Access** This article is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License, which permits any non-commercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if you modified the licensed material. You do not have permission under this licence to share adapted material derived from this article or parts of it. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/>.

Introduction

Emotional contagion is the process of unwittingly transferring positive or negative emotions from one individual to another. In this way, emotions can be transmitted to others; individuals can experience and internalize the emotions of those around them without realizing it, and enter into similar emotional states. This situation prepares the ground for individuals to develop a shared emotional state, influenced by their social environment, and to spread similar emotions at the social level [1, 2]. In this way, emotional contagion can occur when people are affected by each other's emotions. At the same time, emotional contagion can spread both among teams and across all social networking platforms [3]. This spread is usually automatic, uncontrolled, unintentional, and unrecognized in a fast process [4].

Emotional contagion becomes more pronounced, especially during times of crisis that affect society as a whole, such as pandemics caused by communicable diseases. One of the most common negative emotions associated with communicable diseases is fear, and fear spreads more rapidly than positive emotions [5–7]. A study reported that fear was the most contagious emotion during the COVID-19 pandemic [8]. Emotional contagion is a significant factor that amplifies the level of fear and accelerates the rate of spread [9]. The recent COVID-19 pandemic is a striking example of this situation. The most dominant emotion during the pandemic is the intense fear that individuals or their relatives will contract the disease. This fear quickly spread throughout society through the media, social networks, friends, and family [3].

In communicable disease processes, fear can spread through emotional contagion, having both positive and negative consequences. Fear of the disease can play a positive role in preventing its spread by encouraging individuals to adopt protective behaviors [9–11]. A study shows that individuals who experience negative emotions during the COVID-19 pandemic adopt more preventive behaviors [12]. However, when negative emotions are not managed, the tendency for individuals to express their emotions in both online and offline environments increases, leading to the transfer of emotions to others. In this way, emotions can continue to spread rapidly in the social environment and lead to the formation of social clusters where negative emotions are concentrated, thus leading to the emergence of an emotional spiral [3, 5, 13, 14].

Fear spread through emotional contagion can negatively affect the general mental health of society, leading to anxiety, stress, depression, restlessness, obsessive thinking, sleep, and nutrition problems [15–17]. It can also negatively affect individuals' rational and balanced decision-making processes, leading to consequences

such as refusing or delaying medical treatment or misinterpreting symptoms. This may lead to delayed early diagnosis and treatment, posing serious risks to public health [9, 18, 19]. Similar studies on COVID-19 have yielded results in this direction, finding that the fear of contracting the virus delays medical care and even drives people away from health services [20–22]. Importantly, spreading fear can lead to negative consequences, including social panic, stigmatization, blame, and discrimination. These consequences may lead individuals to deny clinical symptoms, making it difficult to control the disease in the community [19, 23]. A study on HIV reported that fear of transmission leads to stigmatization of people living with HIV [24].

In the existing literature, emotional contagion has been examined primarily in the context of general fear, anxiety, and stress levels during pandemic periods. Previous studies have investigated the role of emotional contagion in shaping psychological responses such as fear and anxiety related to COVID-19. However, the number of studies directly addressing the fear of infection and transmission associated with infectious diseases is limited. Particularly in groups characterized by intense social interaction, such as university students, the relationship between emotional contagion and fears of infection and transmission has not been sufficiently examined.

Furthermore, the vast majority of studies in this field rely primarily on quantitative methods, and the limited number of mixed-methods studies constrains the development of a comprehensive understanding of how emotional processes interact with health-related fears. A more detailed examination of these relationships could provide important insights into the mechanisms through which emotional dynamics influence perceptions of disease-related risks.

This study examines the relationship between emotional contagion and the fear of contracting or transmitting infectious diseases in a descriptive cross-sectional framework. Fear related to transmission was measured using the Fear of Transmission/Infectious Disease Scale. Furthermore, integrating quantitative and qualitative data provides a more comprehensive understanding of the relationship between emotional contagion and health-related fears among university students.

Research questions

1. What is the level of emotional contagion among students studying in some departments of the health field?
2. What is the level of fear of contagion/transmission among students studying in some departments of the health field?

3. Is there a relationship between emotional contagion and fear of contagion?
4. Does emotional contagion have an impact on fear of contagion/transmission?

Materials and methods

Research design

This study is a descriptive cross-sectional, mixed-methods study conducted in December 2022 [25, 26]. The data in the study were collected using a convergent parallel design [27–29]. In this design, quantitative and qualitative data were collected within the same time frame, analyzed independently, and findings were compared during the interpretation phase to provide a comprehensive evaluation. Quantitatively, students' emotional responses to infectious diseases and their fear of infection/transmission were measured. Qualitatively, students' experiences and perceptions of infectious diseases were examined within a descriptive qualitative approach.

Population and sample

The study population consists of 1100 students enrolled in two Vocational Schools at the relevant university. The quantitative sample size was calculated as 285 students using the Raosoft Sample Size Calculator, based on a 50% event frequency, 95% confidence level, and 5% margin of error. In the study, 509 volunteer students provided data, thus meeting the minimum sample requirement. The fact that data was collected above the calculated minimum sample size supports the adequacy of the sample for quantitative analysis.

The qualitative sample consisted of volunteer students who agreed to participate in the study during data collection. Data collection was terminated at data saturation, when responses began to repeat, and no new themes emerged. The qualitative sample size was limited to 49 participants.

Inclusion criteria: being 18 years of age or older, answering all survey questions thoroughly and consistently, and participating voluntarily.

Exclusion criterion: presence of blank questions in the data collection forms and absence from class during data collection.

Data collection process and tools

This study used a mixed-methods design, in which both quantitative and qualitative data obtained through open-ended questions were analyzed. The data were collected in writing during a single session in a classroom setting under the researcher's supervision. Before the data collection process, the purpose of the study was explained to the participants, their verbal consent was obtained, and the principles of anonymity and confidentiality were ensured. The data collection process lasted an average

of 20–25 min. Additionally, a scale was used to collect quantitative data in the study.

Personal information form

The form, prepared by the researchers, consisted of three questions regarding the participants' gender, age, and the program in which they were enrolled.

Quantitative tools

Data were collected using the Emotional Contagion Scale and the Contagion/Transmission Fear Scale. The reliability of the scale was assessed using Cronbach's Alpha.

Qualitative questionnaire

The questionnaire was developed with consideration of the literature on risk perception of infectious diseases, emotional responses, and emotional contagion. The questionnaire was designed as an open-ended survey to elicit participants' individual emotions and perceptions, as well as the factors that influence the formation of these emotions and their manifestations in a social context. The questionnaire consists of a total of four open-ended questions:

1. What is your opinion about communicable diseases? Tell us.
2. What do you do to protect yourself from communicable diseases? Tell us.
3. How would your life be affected if you were infected with a communicable disease? Tell us about it.
4. How would you feel if you were told that communicable diseases will increase in the future? Tell us about it.

All participants were asked the same questions, and the data collection process was conducted according to a standardized protocol. For this reason, no additional follow-up questions were included during data collection. However, the open-ended questions were designed to allow participants to express their feelings, thoughts, and experiences in detail.

Emotional Contagion Scale (ECS)

Developed by Doherty, this scale captures individuals' emotions, such as fear and anger, and assesses their sensitivity and proneness to emotional contagion [30]. The validity and reliability of the Turkish scale were assessed by Akin et al. [4]. The scale consists of 15 items in total. The original scale consists of five sub-dimensions: happiness, love, fear, anger, and sadness, and a total of 15 items. In the Turkish validity and reliability study of the scale, it was reported that all factors showed good agreement in a single dimension [4]. The scale is a five-point Likert scale, ranging from 1 (Never) to 5 (Always). Averages closer to

1 indicate low emotional contagion, while averages closer to 5 indicate high emotional contagion [31]. There are no reverse-coded questions in the scale. The Cronbach α internal consistency coefficient of the scale was found to be 0.90 in the original study [30]. In the Turkish adaptation study, it was found to be 0.75 [4]. Although Cronbach α internal consistency coefficient is preferred to be above 0.70, it is stated that it can also be considered reliable above 0.60 [32]. In this study, the total Cronbach's α value of the scale was 0.81.

Fear of Contagion/ Transmission Scale (FCTS)

This scale was developed by Koç and Bilgehan to assess the fear of contagion or transmission of diseases and epidemics in the community [33]. The scale, for which validity and reliability studies were conducted, consisting of four sub-dimensions and 24 items. Each item in the scale is on a 5-point Likert scale. The items are scored as 1 = Strongly Disagree and 5 = Strongly Agree. There are no reverse-coded items. Scores obtained from the scale range from a minimum of 24 to a maximum of 120, and there is no cut-off point (cut-off score). An increase in the total score obtained from the scale indicates an increase in the fear of contamination or infection. The total Cronbach's α value of the scale is 0.91 [33]. In this study, the total Cronbach's α value of the scale is 0.87.

Data analysis

SPSS 22 (Statistical Package for the Social Sciences) program was used for statistical analysis of the data. Descriptive data were expressed as percentages, mean, and standard deviation. Pearson correlation analysis was used to evaluate the relationship between variables. Linear regression analysis was used to examine the predictive effects of variables on each other. In the correlation analysis, a value of 0–0.19 was considered as no correlation; 0.20–0.39 as a weak correlation; 0.40–0.69 as a moderate correlation; 0.70–0.89 as a strong correlation; 0.90–1.00 as a robust correlation. The significance value was considered as $p < 0.05$ [34].

In the qualitative dimension of the study, the responses to the four open-ended questions posed to the participants were analyzed using descriptive and content analysis methods. The analysis process was conducted in three stages following a systematic approach. In the first stage, the data were coded in accordance with the study's objectives. In the second stage, participants' statements were examined separately for each question, and initial themes

were identified by determining meaningful patterns within the dataset. During this process, coding was performed independently by three researchers; the resulting codes were compared to ensure consensus, and any discrepancies were resolved through discussion and agreement. This approach aims to enhance the reliability and confirmability of the themes. At this stage, six themes were identified from the first question: “disruption of social life, not finding it frightening, danger to society, taking precautions, a challenging process, and fear”; four themes from the second question: “boosting immunity, mask usage, maintaining social distancing, and the importance of hygiene”; from the third question, four themes: “focusing on positive thoughts, negative physical effects, negative social effects, and negative psychological effects”; and from the fourth question, two themes: “a routine process” and “anxiety/fear of the future.”

In the third stage, the initial themes were re-evaluated for content similarities and conceptual relationships. The themes were reviewed through continuous comparison with the dataset and consolidated under higher-level conceptual categories. Accordingly, the thematic structure was reorganized, and it was determined that the participants' views were grouped around four main themes: “emotional responses, perceived effects, protective behaviors, and coping/adaptation strategies.”

In addition, the researchers adopted a reflexive approach, remaining mindful of their own potential biases throughout the analysis process, and took care to ensure that the data directly supported their interpretations. To facilitate a better understanding of the identified themes, each theme was supported by direct quotations from participant statements. This approach was chosen to enhance the transparency of the findings and to enable readers to follow the interpretive process.

Results

Of the 509 students participating in the study, 17.3% were male, with women making up the majority. The average age was 22.02 ± 5.93 . 54.2% of the students are in their first year of study. 80% are studying in the field of health, and 20.0% are studying in agriculture. These students from different fields reflect the diversity of the study sample.

In the study, the mean emotional contagion scale score of the participants was found to be moderate, with a score of 2.96 ± 0.49 , and the mean contagion scale score was above the midpoint, at 89.37 ± 15.83 . Scale averages are shown in Table 1.

In the correlation analysis, a low-level, positive, and significant correlation was found between ECS and FCTS total ($r = 0.298$, $p < 0.001$) (Table 2).

According to the model, ECS had a significant effect on FCTS ($F(1,507) = 49.449$; $p < 0.001$). The

Table 1 ECS and FCTS scale analysis

	<i>n</i>	Min	max	Mean	Sd
ECS	509	1	4	2.96	0.49
FCTS	509	38	120	89.37	15.83

ECS Emotional Contagion Scale, FCTS Fear of Contagion/ Transmission Scale

Table 2 Pearson correlation analysis of ECS, FCTS totals

		FCTS Total
ECS Total	r	0.298
	p	< 0.001

ECS Emotional Contagion Scale, FCTS Fear of Contagion/ Transmission Scale

level of emotional contagion explains 8.9% of the variance in FCTS. A one standard deviation increase in ECS score will increase FCTS score by 0.29 standard deviations (<0.001) (Table 3). Regression formula $FCTS = 60.645 + 9.697 * ECS$.

Upon evaluating the qualitative portion of the study, four main themes were identified from the four questions. Under each theme, participant statements that led the researcher to that theme were included as raw data.

Theme 1: emotional reactions

A significant portion of the participants expressed emotional reactions such as fear, anxiety, and concern about the future when sharing their thoughts on infectious diseases. Students believe that infectious diseases pose a risk to both their own health and the health of those around them, and they note that this situation can cause anxiety. However, some participants adopted a more composed approach, stating that infectious diseases are manageable thanks to scientific advancements and the precautions available.

Sample participant statements:

- “The fact that it puts our health at risk certainly frightens my nation and me.” (K.1)
- “Infectious diseases are quite frightening because of the risk they pose to people’s lives.” (K.5)
- “I worry and might panic.” (K.26)
- “I’m afraid of infecting my family and those around me, and of catching the disease myself.” (K.37)
- “The rise in infectious diseases doesn’t scare me much, because we live in the age of science.” (K.3)

Theme 2: perceived effects

Participants noted that infectious diseases can affect individuals’ lives in various ways. These effects were specifically mentioned in psychological, social, and physical terms. Students pointed out that the disease can negatively affect an individual’s psychological well-being, restrict social life, and cause physical effects such as fatigue and weakness. Additionally, some participants

emphasized that infectious diseases also pose a risk to public health.

Sample participant statements:

- “I feel bad psychologically.” (K.6)
- “I would isolate myself from social life and withdraw into my personal space.” (K.4)
- “I feel weak and tired for days.” (K.18)
- “One person’s illness can become the community’s illness.” (K.43)

Theme 3: defensive behaviors

It was observed that participants developed various behaviors to protect themselves from infectious diseases. These behaviors were specifically described as paying attention to hygiene practices, maintaining social distancing, wearing masks, and continuing healthy lifestyle habits to strengthen the immune system. The students emphasized the importance of individual precautions in protecting against infectious diseases.

Sample participant statements:

- “I definitely pay close attention to hygiene.” (K.1)
- “I wash my hands frequently.” (K.18)
- “I’m careful about physical contact.” (K.11)
- “I try to avoid crowded places.” (K.16)
- “I wear a mask.” (K.8)
- “I pay attention to my diet and try to boost my immunity.” (K.47)

Theme 4: coping and adaptation strategies

Some participants stated that they would try to manage the process more controllingly and with greater information if they were to encounter an infectious disease. Participants noted that approaches such as adhering to the treatment process, maintaining a positive attitude, taking necessary precautions, and informing those around them are important during this process. This indicates that students possess a certain level of awareness regarding how to cope with infectious diseases.

Sample participant statements:

- “I’ll do whatever needs to be done and try to keep myself happy.” (K.3)
- “I would proceed with my treatment under a doctor’s supervision.” (K.20)
- “I believe I will get through this and keep my spirits up.” (K.14)

Table 3 Linear regression analysis showing the effect of ECS on FCTS

	B	β	t	p	95% CI for B	
(Constant)	60.645		14.649	< 0.000	52.512	68.779
ECS	9.697	0.298	7.032	< 0.000	6.988	12.406

ECS Emotional Contagion Scale, FCTS Fear of Contagion/ Transmission Scale

- “I would inform my social circle about this issue.” (K.33)

Discussion

Emotions can spread between individuals through emotional contagion, similar to infectious diseases, as described in the literature [7, 35]. It has been reported that during this process, positive and negative emotions can be transmitted to others through interpersonal interactions, and groups of individuals sharing similar emotions have been observed [36]. Studies have shown that emotional contagion tendencies are reported at higher levels during periods when infectious diseases are present, particularly during epidemics [37–39].

This study found that students' level of emotional contagion was moderate. This finding indicates that students can be sensitive to environmental emotions during periods of contagious disease. Furthermore, it was observed that as sensitivity to emotional contagion increased, individuals' fear intensity also increased. It has been reported that this intense fear spreads more rapidly through the environment [7].

This study found that students' fear of infection/transmission was moderate. This finding is consistent with similar studies in the literature [15, 40]. It has been reported that fear of contracting the disease or transmitting it to others is common among individuals during epidemics [41]. Previous studies have emphasized the relationship between fear level and protective health behaviors (such as handwashing and maintaining social distance) [42, 43]. Furthermore, the literature indicates that a certain level of fear can shape individuals' perception of threatening situations and their ability to respond appropriately [44]. In light of this information, students with moderate levels of fear may be inclined to perceive potential risks in the event of an infectious disease and take various precautions.

The study found a significant positive relationship between emotional contagion and fear of infection and transmission. Furthermore, it was determined that emotional contagion significantly predicts the fear of infection/transmission. These findings indicate that as students' emotional influence from their social environment increases, their fear of infection and transmission also tends to increase. This result provides an important indicator for understanding how waves of fear spread among university students during times of crisis. Within this framework, it is recommended that intervention programs be designed to help university students recognize emotional contagion processes, identify emotions, such as fear, that may arise during these processes, and develop healthy communication and empathy skills to manage their emotions effectively. This will support

students' capacity to cope with the negative effects of emotional contagion.

The study also found that emotional contagion accounts for 8.4% of the variance in fear of contagion/transmission. Although this finding is statistically significant, the low level of variance explained suggests its practical effect may be limited. This suggests that emotional contagion alone is not the sole determinant in the formation of fear of contagion and transmission, and that other psychosocial, environmental, and individual factors may also play a role. Therefore, in approaches to understanding and managing students' fear experiences during infectious diseases, it is important to consider these additional factors alongside emotional contagion processes.

The qualitative findings indicate that students' perceptions of infectious diseases are shaped not only at the individual level but also within a social context. Participants exhibited strong emotional reactions to infectious diseases, with fear, anxiety, and concern about the future being the most frequently expressed emotions. Students emphasized that these diseases pose a risk to both their own health and the health of those around them, noting that this situation causes anxiety.

These findings support the notion that the phenomenon under study is an “emotional outbreak.” In other words, emotions are not merely experienced individually but can also be transmitted to others through social interactions. For example, while students' statements such as “I'm afraid of infecting my family, my surroundings...” express the risk of physical transmission, it is observed that this anxiety can have indirect effects on the social environment and trigger societal anxiety. This situation highlights that infectious diseases have not only biological but also significant social and emotional dimensions.

Participants noted that infectious diseases can affect individuals' lives in a multidimensional way—psychologically, socially, and physically. Experiences such as social isolation, restrictions on daily life, and psychological distress demonstrate that the disease process yields not only individual but also social consequences. The students' statements that “one person's illness can be the community's illness” support the notion that risk perception is evaluated within a collective framework.

The study's qualitative findings are explanatory and supportive of the quantitative results obtained. Students indicated that emotional responses, perceived effects, protective behaviors, and coping/adaptation strategies shape their perceptions regarding infectious diseases. Students experience significant fear and anxiety regarding both the possibility of becoming infected and the likelihood of transmitting the infection to others. Similarly, the literature reports that students experience anxiety and fear regarding infectious diseases [45].

In addition, students indicated that they perceive the potential for negative psychological, social, and physical consequences should they contract an infectious disease. At the same time, participants viewed infectious diseases not only as a risk to individual health but also as a threat to public health, noting that such situations could lead to various restrictions and disruptions in social life. Students also noted the importance of societal-level awareness and behavior, in addition to individual precautions, indicating an understanding of the manageability of the pandemic's emotional and social aspects.

It appears that students have a high level of awareness regarding protection against infectious diseases. Participants emphasized the importance of behaviors such as practicing good hygiene, wearing masks, maintaining social distancing, and strengthening the immune system. Additionally, some students indicated that they could develop coping strategies, such as adhering to the treatment process, maintaining a positive mindset, and informing their surroundings if they encountered an infectious disease. This demonstrates that students have the capacity to cope with and adapt to the disease, both individually and in a social context.

However, the study also identified students who did not find infectious diseases frightening. These students cited factors such as the availability of preventive measures and treatment options, access to information, and positive expectations for recovery as reasons for their attitude. They also stated that they believed new diseases could be managed thanks to advances in science. Experiences gained during the COVID-19 pandemic may have contributed to these perceptions. Studies in the literature report that awareness and education programs on infectious diseases can reduce fear levels [46, 47], while exposure to misinformation can increase fear [48, 49].

The findings of this study support previous studies focusing on the relationship between emotional contagion and fear. Furthermore, addressing this relationship in the context of fear of contagion and transmission offers a new perspective to the literature. Although the study has a descriptive cross-sectional design, the findings reveal how emotional contagion and disease-related fears co-occur and contribute to the descriptive expansion of the existing theoretical framework. Furthermore, the combined evaluation of quantitative and qualitative findings has revealed not only the level of students' fear experiences but also the meanings they attach to these fears. In this respect, the study contributes to theoretical discussions on the relationship between emotional contagion processes in infectious diseases and individual and societal perceptions of fear.

In conclusion, infectious diseases not only pose a biological threat but also affect individuals' emotional states, leading to various consequences at both the individual

and societal levels. Assessing the spread of negative emotions, such as fear triggered by infectious diseases highlights the need to address them as a second epidemic [7, 23]. Therefore, understanding how emotions such as fear, which affect people's mental health and behavior during infectious diseases, spread can inform the development of disease management strategies [50, 51]. Examining the relationship between emotional contagion and the fear of infection and transmitting it to others provides important descriptive information for understanding individuals' health-related risk perceptions and decision-making processes.

At the same time, our findings indicate that emotional contagion affects not only individual emotional experiences but also the behaviors and reactions observed in the social environment. In particular, positive emotional contagion can reduce anxiety, thereby limiting irrational fear responses and encouraging compliance with health measures. In this context, in public health communication, using visuals that depict individuals practicing safe and effective precautions—in addition to messages emphasizing risk and fear—can trigger a “contagion of calm” rather than a “contagion of fear.” For example, messages featuring individuals wearing masks, practicing hygiene, or maintaining social distancing can foster positive emotional responses among viewers, thereby encouraging them to adopt protective behaviors.

Limitations of the study

The use of convenience and voluntary sampling methods in the study may limit the generalizability of the findings. Furthermore, the fact that the data were collected in a classroom setting may have led to selection bias among the students participating in the study in terms of certain characteristics. The findings should be evaluated in light of these limitations.

Another significant limitation of this study is that a large portion of the sample consists of students enrolled in health sciences programs. This may have led participants to have a higher level of health literacy than the general population. Consequently, the fact that perceptions, emotions, and behaviors regarding infectious diseases are expressed within a more informed framework may limit the generalizability of the findings. In this context, the results reflect the perspective of individuals primarily educated in the health field rather than representing the general population. Future studies using more heterogeneous samples will enhance the generalizability of the findings.

Conclusion and recommendations

In this study, university students' emotional contagion and fear of contagion or transmission were found to be at a moderate level. A significant positive correlation was

found between emotional contagion and fear of contagion/transmission. It was seen that the level of emotional contagion affected the fear of contagion or transmission by 8.4%. This suggests that the emotions of others influence students, and their fears may intensify as a result. Therefore, it is of great importance to ensure social well-being and manage effective coping processes in the presence of communicable diseases. It also suggests that public health practices for communicable diseases should not be limited to biomedical approaches, but rather should be planned with a more holistic approach that incorporates psychological and emotional factors.

This study is thought to make a unique and vital contribution to the literature as it is the first study to evaluate the effect of the emotional contagion level of university students on the fear of Contagion/transmission. In addition, the findings obtained may form the basis for communicable disease control strategies to be implemented in crowded institutions such as universities.

In light of these findings, we recommend the following interventions on campuses:

- It is recommended to develop health literacy for emotional contagion. It can help these individuals develop more conscious, aware, and balanced responses to negative emotions, such as fear emanating from the environment, especially in times of crisis, like epidemics. Such a level of literacy can contribute not only to the protection of individual mental health, but also to the strengthening of psychological health at the societal level.
- To prevent the adverse effects of emotional contagion in universities, public health interventions may be recommended to increase students' awareness of emotional contagion and to improve their ability to recognize and manage their emotions. Such interventions can be extended not only to students but also to society as a whole.
- It is recommended that public health professionals develop empathy-based communication campaigns that respond to students' emotional needs in addition to conveying information during communicable disease periods. Such campaigns can support individuals to act in an informed and controlled manner without excessive fear.

Acknowledgements

The author would like to thank all the participants in the study.

Authors' contributions

BK conceived of the presented idea. BK, AGB, BGK, EB and KS developed the theory, collected the data and performed the analyses. All authors discussed the results and contributed to the final manuscript.

Funding

This study has been supported by the Recep Tayyip Erdoğan University Development Foundation Grant no: 02026005020353.

Data availability

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

This study observed ethical standards applicable to scientific research involving human participants and all procedures were conducted in accordance with the most current principles of the Declaration of Helsinki. Informed consent was obtained from all participants prior to data collection. The study protocol was approved by Social and Human Science Ethics Committee of Recep Tayyip Erdoğan University (Date: 14.11.2022, Meeting No. 2022\ 282) for the research.

Consent for publication

Not Applicable.

Competing interests

The authors declare no competing interests.

Received: 2 December 2025 / Accepted: 14 May 2026

Published online: 05 June 2026

References

1. van Haeringen ES, Gerritsen C, Hindriks KV. Emotion contagion in agent-based simulations of crowds: a systematic review. *Auton Agent Multi-Agent Syst.* 2023;37:6. <https://doi.org/10.1007/s10458-022-09589-z>.
2. Ayaz E. The effect of COVID-19 fear on emotional contagion. *Int J Strategic Dimension.* 2022;2(1).
3. Belli S, Alonso CV. COVID-19 pandemic and emotional contagion. In: *Special Section: Towards a Sociology of COVID-19. Epidemics, biorisks, and the society of the coronavirus.* Digithum. 2021;27:1–9. <https://doi.org/10.7238/d.v0i27.374153>.
4. Akin A, Uysal R, Akin Ü. The validity and reliability of Turkish version of the emotional contagion scale. *Anemon Muş Alparslan Univ J Social Sci.* 2015;3(2):97–104. <https://doi.org/10.18506/anemon.28290>.
5. Türk B. Emotional contagion in social media in the corona process: Negative emotional climate and value change. *J Mark Res.* 2022;15(2):347–78. <https://doi.org/10.15659/ppad.15.2.971519>.
6. Dubey AD. Twitter sentiment analysis during COVID-19 outbreak. *SSRN Electron J.* 2020. <https://doi.org/10.2139/ssrn.3572023>.
7. Lu D, Hong D. Emotional Contagion: Research on the Influencing Factors of Social Media Users' Negative Emotional Communication During the COVID-19 Pandemic. *Front Psychol.* 2022;15:13:931835. <https://doi.org/10.3389/fpsyg.2022.931835>.
8. Amer SA, Abd-Ellatif EE, Hughes P, Al-Enazi HMG, AlHasan A, Amer MA, Alruhaimi AF, Elsayed M. Emotional contagion scale and mental health status during the first wave of COVID-19 pandemic, national assessment. *Clin Pract Epidemiol Ment Health.* 2022;29:18:e174501792208200. <https://doi.org/10.2174/17450179-v18-e2208200>.
9. Prince M, Kim Y. Threat appraisal, emotional contagion, and fear of COVID-19: Revision of the extended parallel process model. *J Appl Social Sci.* 2023;18(1):120–35. <https://doi.org/10.1177/19367244231208893>.
10. Guo X, Tong J, Chen P, Fan W. The suppression effect of emotional contagion in the COVID-19 pandemic: A multi-layer hybrid modelling and simulation approach. *PLoS ONE.* 2021;28(7):e0253579. <https://doi.org/10.1371/journal.pone.0253579>.
11. Zhang W, Mei J, Evans R, Wu H. The effects of information framing on self-protective behavior: Evidence from the COVID-19 vaccine uptake. *Digital Health.* 2023;9. <https://doi.org/10.1177/20552076231210655>.
12. Kim S, Cho SK, Locascio SP. The role of media use and emotions in risk perception and preventive behaviors related to COVID-19 in South Korea. *Asian J Public Opin Res.* 2020;8:297–323. <https://doi.org/10.15206/ajpor.2020.8.3.297>.
13. Crocama C, Viviani M, Famigliani L, Bartoli F, Pasi G, Carrà G. Surveilling COVID-19 emotional contagion on twitter by sentiment analysis. *Eur Psychiatry.* 2021;3(1):e17. <https://doi.org/10.1192/j.eurpsy.2021.3>.

14. Steinert S. Corona and value change. The role of social media and emotional contagion. *Ethics Inf Technol*. 2021;23(Suppl 1):59–68. <https://doi.org/10.1007/s10676-020-09545-z>.
15. Iskender MD, Gülsoy A, Özcan E, Uyan Y. The effect of fear of contagion/being contagious on depression, anxiety and stress levels of university students during the COVID-19 pandemic. *J Clin Nurs*. 2024;33(1):192–202. <https://doi.org/10.1111/jocn.16602>.
16. Richaud MC, Muzio RN, Lemos V, Urquijo S, Carlo G, Editorial. Psychosocial effects of isolation and fear of contagion of COVID-19 on the mental health of different population groups. *Front Psychol*. 2022;13:1011028. <https://doi.org/10.3389/fpsyg.2022.1011028>.
17. Nehir S, Tavşanlı NG. The effect of COVID-19 pandemic on the nursing and midwifery students' perception of fear and control. *Med Sci*. 2021;16(2):141–50. <https://doi.org/10.12739/NWSA.2021.16.2.180116>.
18. Shukla P, Lee M, Whitman SA, Pine KH. Delay of routine health care during the COVID-19 pandemic: A theoretical model of individuals' risk assessment and decision making. *Soc Sci Med*. 2022;307:115164. <https://doi.org/10.1016/j.socscimed.2022.115164>.
19. Saeed F, Mihan R, Mousavi SZ, Reniers RL, Bateni FS, Alikhani R, Mousavi SB. A narrative review of stigma related to infectious disease outbreaks: What can be learned in the face of the Covid-19 pandemic? *Front Psychiatry*. 2020;2:11:565919. <https://doi.org/10.3389/fpsyg.2020.565919>.
20. Smolic Š, Fabijancić M, Blaževski N. How did fear of COVID-19 affect access to healthcare in Central and Eastern Europe? Findings from populations aged 50 or older after the outbreak. *Eastern Eur Econ*. 2022;61(5):571–90. <https://doi.org/10.1080/00128775.2022.2150218>.
21. Nab M, van Vehmendahl R, Somers I, Schoon Y, Hesselink G. Delayed emergency healthcare seeking behaviour by Dutch emergency department visitors during the first COVID-19 wave: A mixed methods retrospective observational study. *BMC Emerg Med*. 2021, 1;21(1):56. <https://doi.org/10.1186/s12873-021-00449-9>.
22. Lange SJ, Ritchey MD, Goodman AB, Dias T, Twentymen E, Fuld J, Schieve LA, Imperatore G, Benoit SR, Kite-Powell A, et al. Potential indirect effects of the COVID-19 pandemic on use of emergency departments for acute life-threatening conditions - United States, January-May 2020. *MMWR Morb Mortal Wkly Rep*. 2020;26(25):795–800. <https://doi.org/10.15585/mmwr.mm6925e2>.
23. Fofana NK, Latif F, Sarfraz S, Bilal, Bashir MF, Komal B. Fear and agony of the pandemic leading to stress and mental illness: An emerging crisis in the novel coronavirus (COVID-19) outbreak. *Psychiatry Res*. 2020;291:113230. <https://doi.org/10.1016/j.psychres.2020.113230>.
24. Jaimes YAP, Lozada-Martínez ID, Tosás MR, Tiraboschi J. Stigma and fear of getting sick in the care of people living with HIV: An exploratory systematic review. *Infez Med*. 2024;1(2):168–82. <https://doi.org/10.53854/iim-3202-6>.
25. Wang X, Cheng Z. Cross-Sectional studies: Strengths, weaknesses, and recommendations. *Chest*. 2020;158(15):S65–71. <https://doi.org/10.1016/j.chest.2020.03.012>.
26. Rana K, Chimoriya RA. Guide to a Mixed-Methods Approach to Healthcare Research. *Encyclopedia*. 2025;5(2):51. <https://doi.org/10.3390/encyclopedia5020051>.
27. Zheng M. Conceptualization of cross-sectional mixed methods studies in health science: a methodological review. *Int J Quant Qualitative Res Methods*. 2015;3(2):66–87.
28. Creswell JW. *Research Design: Qualitative, Quantitative and Mixed Methods Approaches*. 4th ed. Thousand Oaks, CA: Sage; 2014.
29. Sharma DL, Bidari S, Bidari D, Neupane S, Sapkota R. Exploring the mixed methods research design: Types, purposes, strengths, challenges, and criticisms. *Glob Acad J Linguist Lit*. 2023;5(1):3–12.
30. Doherty RW. The emotional contagion scale: a measure of individual differences. *J Nonverbal Behav*. 1997;21(2):131–154.
31. Demirkaya F, Sönmez B. Determination of emotional contagion levels of nurses working in a public hospital. *J Inonu Univ Health Serv Vocat School*. 2020;8(3):802–13. <https://doi.org/10.33715/inonusaglik.744189>.
32. Kılıç S. Cronbach's alpha reliability coefficient. *Psychiatry Behav Sci*. 2016;6(1):47–8.
33. Koç A, Bilgehan T. Bulaşma/bulaştırma korkusu ölçeği: Bir ölçek geliştirme çalışması. *Türk Hemşireler Derneği Dergisi*. 2021;2(2):14–26.
34. Alpar R. Uygulamalı istatistik ve geçerlilik-güvenilirlik. Detay Yayıncılık. Yenilenmiş 4 Baskı. Ankara. 2016:647s.
35. Ni X, Zhou H, Chen W. Addition of an emotionally stable node in the SOSa-SPSa model for group emotional contagion of panic in public health emergency: Implications for epidemic emergency responses. *Int J Environ Res Public Health*. 2020;14(14):5044. <https://doi.org/10.3390/ijerph17145044>.
36. Xu H, Sudheendra MS, Huh J, Salecha A, Srivastava J. Influence of emotions on coping behaviors in crisis: A computational analysis of the COVID-19 outbreak. *J Comput Soc Sci*. 2024;7:1599–623. <https://doi.org/10.1007/s42001-024-00282-7>.
37. Mayo O, Horesh D, Korisky A, Milstein N, Zadok E, Tomashin A, Gordon. I. I feel you: Prepandemic physiological synchrony and emotional contagion during COVID-19. *Emotion*. 2023;23(3):753–63. <https://doi.org/10.1037/emo0001122>.
38. Zhu Y, Zhang W, Li C. Modeling emotional contagion in the COVID-19 pandemic: A complex network approach. *PeerJ Comput Sci*. 2023;209:e1693. <https://doi.org/10.7717/peerj-cs.1693>.
39. Wheaton MG, Prikhidko A, Messner GR. Is fear of COVID-19 contagious? The effects of emotion contagion and social media use on anxiety in response to the coronavirus pandemic. *Front Psychol*. 2021;11:567379. <https://doi.org/10.3389/fpsyg.2020.567379>.
40. Tören S, Torun O. Fear of infectious contagion/transmission among health sciences students and its relationship to their attitudes toward the COVID-19 vaccine. *J Intensive Care Nurs*. 2024;28(1):37–45.
41. Alexandrou R, Kyprianidou M, Photiou G, Kassianos AP, Giannakou K. Factors associated with perceived fear of future pandemics and/or epidemics: A cross-sectional study in Cyprus. *Sci Rep*. 2023;27(1):12194. <https://doi.org/10.1038/s41598-023-39381-2>.
42. Mertens G, Engelhard IM, Novacek DM, McNally RJ. Managing fear during pandemics: Risks and opportunities. *Perspect Psychol Sci*. 2024;19(4):652–9. <https://doi.org/10.1177/17456916231178720>.
43. Harper CA, Satchell LP, Fido D, Latzman RD. Functional fear predicts public health compliance in the COVID-19 pandemic. *Int J Ment Health Addict*. 2021;19(5):1875–88. <https://doi.org/10.1007/s11469-020-00281-5>.
44. Keyser C, Gazzola V. Emotional contagion: Improving survival by preparing for socially sensed threats. *Curr Biol*. 2021;7(11):R728–30. <https://doi.org/10.1016/j.cub.2021.03.100>.
45. Lovrić R, Farčić N, Mikšić Š, Včev A. Studying during the COVID-19 pandemic: A qualitative inductive content analysis of nursing students' perceptions and experiences. *Educ Sci*. 2020;10(7):188. <https://doi.org/10.3390/educsci10070188>.
46. Cerda AA, García LY. Factors explaining the fear of being infected with COVID-19. *Health Expect*. 2022;25(2):506–12. <https://doi.org/10.1111/hex.13274>.
47. Johnson EJ, Hariharan S. Public health awareness: knowledge, attitude and behaviour of the general public on health risks during the H1N1 influenza pandemic. *J Public Health*. 2017;25:333–7. <https://doi.org/10.1007/s10389-017-0790-7>.
48. Xiao Y. The internet usage increases fear of infection with Covid-19. *Sci Rep*. 2025;15:4936. <https://doi.org/10.1038/s41598-025-88283-y>.
49. Chowdhury N, Khalid A, Turin TC. Understanding misinformation infodemic during public health emergencies due to large-scale disease outbreaks: A rapid review. *J Public Health (Berl)*. 2023;31:553–73. <https://doi.org/10.1007/s10389-021-01565-3>.
50. Türedi GK, Altuntaş S. Emotional Contagion and Nursing. *Stud Social Sci Insights*. 2023;3(2):66–82. <https://doi.org/10.53035/SOSSCI.65>.
51. Bedford J, Enria D, Giesecke J, Heymann DL, Ihekweazu C, Kobinger G, Lane HC, Memish Z, Oh MD, Sall AA, et al. COVID-19: Towards controlling of a pandemic. *Lancet*. 2020;395:1015–8. [https://doi.org/10.1016/S0140-6736\(20\)30673-5](https://doi.org/10.1016/S0140-6736(20)30673-5).

Publisher's note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.