Parasocial Interaction with Media Characters
Medya Karakterleriyle Kurulan Parasosyal Etkileşim

Gözde Aytulun 1, Ayda Büyükşahin Sunal 2

Abstract
The main purpose of this study is to understand the nature of the parasocial interaction with media characters, to have knowledge about the causes, and to review important previous researches on parasocial interaction. In this way, it is aimed to have information about the premises of the parasocial interaction and the variables it is associated with and to determine the possible effects of these variables on social life. Considering the previous studies, it is seen that the focus is on the relationships with the character in the series. For this reason, this study focuses mainly on the interaction with characters of series. In the study, firstly, the nature and premises of the concept of parasocial interaction are mentioned, and then the similarities of this interaction with interpersonal relations are mentioned. Finally, some researches and some suggestions were made about this subject, in which parasocial interaction was examined, especially in terms of age, gender, loneliness, and social anxiety.

Keywords: Parasocial interaction, television series, media characters

Öz

Anahtar sözcükler: Parasosyal etkileşim, televizyon dizileri, medya karakterleri

1 StratejiCo, İstanbul, Turkey
2 Ankara Üniversitesi, Ankara, Turkey

Aya Büyükşahin Sunal, Ankara University Faculty of Languages History and Geography, Dept. Psychology, Ankara, Turkey bsahin@humanity.ankara.edu.tr

Received: 11.02.2020 | Accepted: 13.03.2020 | Published online: 03.05.2020
TV SERIES has become one of the indispensable elements of daily life. Individuals follow the series every week to watch their favorite shows, to learn what will happen in the series, and to see their favorite characters in that series. The role of the series of characters undoubtedly has the most considerable role in watching the TV series. Individuals feel as if they are hosting their favorite characters at home or meeting their loved friends while watching the series. They enjoy watching the characters they like, evaluate their behavior and conversations, and even get upset and angry when they leave the show. They can rejoice when they are happy, and they may become happy with them when something good happens to them. They may also be upset when the media characters fail or are defeated. While watching their favorite characters, they may feel as if they are talking to a relative; they share their loneliness, unhappiness, joy, and establish a close relationship with the characters (Hoffner and Cantor 1991). In short, viewers establish a trust relationship with the media characters who are visiting their homes through television or digital platforms, and they do not want to miss any episodes in which they take place in order not to shake that trust. Thus, a close bond is established between the audience and the media character. The concept of parasocial interaction was proposed by Horton and Wohl (1956) to describe this bond or interaction. According to Horton and Wohl, who argued that watching television is also a kind of social interaction, there is a similar relationship between media character and the audience. However, this relationship is one-way and symbolic but controlled by the audience. That is, when the audience or audience interacts with the media character, the media character does not even know about it. In other words, the audience feels close to the media character, but the media character does not even know about it. If the audience does not like the work, the only option is not to choose it and to give up this interaction. Even though this process, called parasocial interaction, is closed to a one-way, common relationship development (as opposed to face-to-face communication), viewers tend to develop an emotional bond against the media character.

The purpose of this study is to understand the nature of the parasocial relations established with the media characters, to have knowledge about their premises, and to review the studies on parasocial interaction. In this way, it is aimed to have information about the causes of the parasocial interaction and the variables it is associated with and to determine the possible effects on social life. The previous studies showed that the focus is on the relationships with the character in the series (Arda 2006; Rubin and Perse 1987b, Perse and Rubin 1989, Kim and Rubin 1997, Sheffner-Rogers et al. 1998, Sood and Rogers 2000, Tian and Hoffner 2010). For this reason, this study also focuses mainly on the interaction with the series’ characters. In the study, firstly, the nature and reasons for the concept of parasocial interaction are elaborated on. Then, the similarities of this interaction with real interpersonal relationships are mentioned. Finally, research findings and some suggestions about the subject are included.

Nature of parasocial interaction

Parasocial interaction or bonds involve the one-way and symbolic relationship of the audience with the media characters (Horton and Wohl 1956). Although this interaction is generally established with the characters that the viewers call their beloved or favorite characters (Cohen 1999), viewers may also interact with the characters they are neutral or dislike (Giles 2002, Arda 2006, Dibble 2011). In the first studies on this kind of in-
teraction, it was mostly observed in interaction with news programs or news announcers (Levy 1979, Howlberg 1984, Rubin et al. 1985) and soap opera characters (Rubin and Perse 1987b, Perse and Rubin 1989, Kim and Rubin 1997). Later on, studies related to interaction/bond with television and radio talk-show program providers (Grant et al. 1991, Gudelunas 2006; Rubin and Step 2000, Rubin et al. 2003), computer games (Lewis and Weber 2008, Jin and Park 2009), comedians (Auter 1992), romance novels (Burnett and Beto 2000), football teams and footballers (Sözen 2014), and studies on the bond with characters in television shows with a reality show (Nabi et al. 2006) have been conducted. Nowadays, the parasocial interaction with social media content producers called "influencer" (Daniel et al. 2018), videos on Youtube (Chen 2016), and media characters on Twitter (Vonderohe 2016) have attracted the attention of researchers.

Similarly, the first studies on the measurement of this concept are mostly based on the measurement of the parasocial bonds established with newscasters, and in this context, the Parasocial Interaction Scale was created (Rubin et al. 1985). Later, Rubin and Perse (1987a) shortened this scale and tried to measure the interaction between viewers and favorite soap opera characters. In 2000, Auter and Palmgreen developed the Audience-Media Character Interaction Scale. This scale consists of 4 sub-dimensions: interaction with a favorite character, interest in the favorite character, identification/interaction with the group, and problem-solving skill of favorite character. The Parasocial Interaction Process Scale developed by Schramm and Hartmann (2008) to measure the three dimensions of the parasocial interaction can be given as an example of the scales developed in the following years. For example, Sood and Rogers (2000) analyzed the content of the letters containing the comments made by the audience for the Hum Log series and revealed that the participation of the audience was multidimensional, cognitive, emotional, behavioral, critical and inferential.

In order to better understand the parasocial interaction with media characters, it is essential to first touch on some concepts that are both related to and different from this interaction. One of the concepts that are strictly related to parasocial interaction is the concept of parasocial relationships. While the parasocial interaction mostly involves the audience’s responses to the media character during the program, the parasocial relationship is a concept that includes the viewer’s long-term interpretations and thoughts during the program and in due course. In other words, with long-term parasocial interaction, parasocial relations emerge (Schmid and Klimmt 2011). In this study, these concepts were used interchangeably from time to time.

Additionally, one of the most frequently confused concepts with parasocial interaction is identification. Identification generally means that the viewer feels as if he/she is experiencing the events in the life of the media character, evaluates the events through the character's eyes, that is replacing himself with the media character, and wants to be in the character's place. In identification, evaluating the events from the viewpoint of the media character is at the forefront (Basil 1996). However, in parasocial interaction, the audience may see the media character as a close friend, feel close and create a bond of closeness with the character, but does not want to be like the media character and does not evaluate the events through character’s eyes (Giles 2002). In short, parasocial interaction with media characters may not include identification with characters.
Antecedents of parasocial interaction

Horton and Wohl (1956) pointed out that the study of the premises or causes of the parasocial interaction is particularly critical for understanding the nature of the parasocial interaction. First of all, there are very realistic dialogues in the television program that includes the media character (actor/actress). These dialogues lead the viewers to think as if they are watching a real event and thus to have social interaction with media characters. Secondly, the media characters in the television program are in a natural position facing the audience and seem to speak to the audience. This position also leads to parasocial bonds. For example, it was concluded that the audience has more parasocial interaction with media characters who directly address them and make eye contact with them (Auter 1992).

Similarly, Alperstein (1991) argued that in television commercials, when famous people directly address the audience, the audience establishes a parasocial bond more frequently. In their study, Cohen (1999) and Nordlund (1978) stated that content of the program, where one or more media characters are dominant or leading and the relevant characters who appear frequently, is more open to media interaction with individuals. Thus, individuals enter into parasocial interaction more frequently in this kind of program content. The third and most substantial reason was the close relationship between the media character and the audience. The audience establishes a close relationship with the media character; because the media character provides the viewers with a continuous relationship that continues at regular intervals, and as a result, the media character becomes a viewers’ routine, that is, a part of the daily lives of the audience. Many researchers (Berger and Calabrese 1975, Rubin and McHugh 1987, Perse and Rubin 1989, Turner 1993, Cohen 2004) have particularly emphasized the importance of this last premise and have concluded that parasocial interaction is a concept similar to real interpersonal relations.

Similarities between parasocial interaction and interpersonal relations

Individuals can fulfill their emotional needs by interacting with the characters of the media in a social way as if they are in real interpersonal interaction. In this context, there are many similarities between these two types of relationships. Attraction, which is one of the similarities between parasocial interaction and social relations, plays a vital role in the development of social relations as well as in the development of parasocial interaction. In other words, the attraction of the media character is one of the most important factors that will enable the target audience to interact with that media character in a social way. This is supported by many studies (McCroskey and McCain 1974, Rubin and McHugh 1987, Hoffer 1996, Arda 2006, Hartmann and Goldhoorn 2011). According to Rubin and McHugh (1987), although the attraction is more of a physical attraction dimension, there are types of attraction such as social attraction and task attraction, which lead to the establishment of parasocial bonds with the media character. If the media character and the target audience have similar attitudes and the personality of the media character is suitable for the audience, this attraction is defined as a social attraction. Task attraction relates, for example, to how a speaker uses the camera throughout the program and how he/she appeals to people. In addition, Rubin and McHugh
(1987) stated that social attraction is a more reliable predictor of parasocial interaction than physical attraction. However, as mentioned earlier, in some cases, physical attraction may come to the fore. As an example, the parasocial bonds developed by male adolescents with female mannequins are mostly related to physical attraction and sexual desires (Schmid and Klimmt 2011). In the study of Arda (2006) conducted in our country, it was concluded that the physical attraction of the media character is a determinant of the parasocial interaction with that character. In a study where these types of attraction are handled based on culture (Schmid and Klimmt 2011), while Mexicans perceive the character of Harry Potter socially more attractive than Germans, Germans rated this character higher in terms of task attraction than Mexicans.

In parallel with all this, the concept of similarity, which causes us to want to interact with people with similar attitudes and values, or even similar physical appearance (Byrne and Nelson 1965) in our interpersonal interactions, is one of the important predictive variables for parasocial interaction (Turner 1993). In other words, when viewers perceive the media character similar to them in terms of both physical appearance, attitude, and resume, they establish more parasocial interaction. In a recent study in our country (Batıgün & Sunal, 2017), women developed bonds with the characters in the domestic series more frequently when compared to the characters in the international series. This finding reveals the importance of similarity.

Reliability, which has a crucial role in interpersonal interactions, is also crucial for the development of parasocial interaction. That is, the more confidence the target audience has in the media character, the stronger the parasocial interaction. One of the critical components of the media character and audience relationship is the extent to which the audience can make a judgment about the media character in parasocial interaction, similar to interpersonal interaction (Giles 2000). In the literature, studies are showing that perceived realism, which is a measure of how individuals perceive their media characters as realistic or believable, is also a significant predictor of parasocial interaction (Rubin and Rubin 1985, Rubin and Perse 1987b, Alperstein 1991, Auier and Palmgreen 2000).

Besides, interpersonal interactions such as parasocial interaction and friendship are established voluntarily (Branch et al. 2013). In this respect, they are similar. Another similarity is related to meeting social needs. Individuals often interact with their relatives to meet their emotional/social needs in social relationships. However, these needs are sometimes not met through interpersonal channels, and individuals revert to media channels to meet these needs. In other words, if social needs cannot be met through interpersonal channels, individuals return to media channels as a coping strategy and try to provide the gratification they cannot achieve in their social relationships. One of the theories proposed to explain this situation is the Uses and Gratifications Theory (Blumler and Katz 1974). This theory mainly focuses on how one uses forms of communication, such as interpersonal communication or mass media, to meet one’s needs and desires (Rubin 2002). According to this theory, individuals turn to mass media in order to compensate for the situations in which they experience difficulties in interpersonal relationships or when people with whom they interact is not sufficient in number.

Many researchers also emphasized that a need that cannot be met through social interaction may be met through parasocial interaction (Rubin 1983, Rubin and Rubin 1985, Rubin et al. 1985, Rubin and Perse 1987b, Derrick et al. 2009). Similarly, introvert and socially anxious individuals tend to engage more with their imaginary media character (Finn and Gorr 1988, Turner 1993, Tsao 1996, Schiappa et al. 2007, Aytulun...
Parasocial Interaction with Media Characters

In other words, socially anxious individuals try to achieve gratification through parasocial interaction that they could not achieve in their interpersonal relationships. Also, as mentioned earlier, parasocial interaction is the one-way relationship, and this type of interaction is under the audience's control. In this context, the ability to break the bond with the media character at any time also ensures that the individual does not experience social anxiety (Schiappa et al. 2007). In another recent study (Bérail et al. 2019), it was found that socially anxious individuals develop parasocial bonds with the characters on the social media platform Youtube. Similarly, some studies revealed that to compensate their failure in face-to-face communication (Kirkcaldy et al. 1998, Norton and Hope 2001, Christensen et al. 2003), individuals with negative self-perception tend to develop parasocial interaction in which control is in the audience and is an easier way to communicate (Batıgün and Sunal, 2017).

Consistent with all these findings, studies that indicate that loneliness as one of the strongest predictors of parasocial interaction are cited frequently (Perse and Rubin 1990, Chory-Assad and Yanen 2005, Davila-Rosado 2006, Wang et al. 2008, Greenwood and Long 2009, Dhanda 2011). Lonely individuals meet both their friendship needs and deal with feelings of loneliness by establishing relationships with media characters. Some studies, on the other hand (Eyal and Cohen 2006, Arslan 2013), revealed that there is no relationship between these two variables. In a study (Wang et al. 2008), it is stated that the relationship with media characters does not replace real interpersonal communication when it comes to social and romantic loneliness.

Some researchers (Rubin and Perse 1987b) stated that strong parasocial interactions or bonds with the media character would lead viewers to think more about the character, make a cognitive effort, and predict what will happen next. In other words, the authors point out that parasocial interaction includes cognitive and behavioral involvement. While cognitive involvement is about the viewer's thinking about the series or media character, behavioral involvement entails talking or discussing with other people about the character, making predictions about what will happen next. Some audiences even compare their way of thinking with the characters (Sood and Rogers 2000). After a while, they begin to think that they know the media characters they watch and are to some extent in their lives (Cohen 2004, Giles and Maltby 2004).

Besides, parasocial interactions have an end similar to that of interpersonal interactions. The concept of parasocial breakup arises in cases such as the media character in which parasocial bonds are established, leaving the program or the program is terminated. In such cases, the audience may stop watching the program or start to have less interest in that media character (Cohen 2003). Just as ending interpersonal interactions is an upsetting experience for individuals (McCarthy et al. 1997), it is emphasized that the response to the parasocial breakup, defined as breakup from the media character, maybe intense, depending on the strength of the parasocial interaction with the media character (Cohen 2003, 2004, Eyal and Cohen 2006). For example, Meyrovitz (1994) stated that after the death of Elvis Presley and John Lennon, those who established strong parasocial bonds with these people were more upset. In another study (Cohen 2003) adolescents and adults were asked how they would feel if their favorite media characters left the program, it was found that adolescents reacted more intensely to the parasocial breakup because they are more emotionally attached to media characters. Besides, Eyal and Cohen (2006) stated that loneliness, perceived popularity of the character, the strength of the parasocial relationship established with the character, and attitudes towards the pro-
gram are strong predictors of the parasocial breakup. In addition, according to Cohen (2003), the end of the audience’s parasocial interaction with the media character is not as stressful as the end of interpersonal interactions such as friendship. In short, it can be stated that there are many similarities between parasocial interaction and interpersonal relations in terms of both developments and in meeting social needs.

**Demographic variables associated with parasocial interaction**

Although in some studies that gender does not affect parasocial interaction (Gleich 1997, Cole and Leets 1999, Greenwood and Long 2011), it is seen that one of the most studied demographic variables is gender. When the data obtained both from our country (RTÜK 2013) and from abroad (Statista Research Department 2015, 2019) are examined, it is seen that women watch television more frequently compared to men. Similarly, given the positive relationship between television viewing time and parasocial relations (Rubin et al. 1985, Gleich 1997), it is inevitable to encounter studies conducted with a female sample or emphasizing the gender gap. In many studies that women establish parasocial interaction more than men (Perse 1990, Tsao 1996, Cohen 2003, Eyal and Rubin 2003, Theran et al. 2010, Lather 2011). In a study conducted recently with married women in our country (Batiğün and Sunal 2017), it was observed that as depressive symptoms and marital unhappiness increased, more parasocial relations were established with the characters in the series. In some previous studies, it was observed that neurotic (Weaver 2003) and introverted (Tsao 1996) individuals spend more time watching television for reasons such as spending time, friendship, relaxation, and acquiring knowledge. In another study with women, Segrin and Nabi (2002) emphasized that as the time spent watching the soap opera increased, the expectations regarding the relationships changed. According to Cohen (1997), similar to social relationships, more women experience television as a relational activity compared to men. This activity leads women to develop bonds with the media characters they watch. Besides, there are also studies in which some significant differences are reached in some parasocial interaction studies (Cohen 1997, Wang et al. 2008) when gender is used as a variable. For example; in one study (Cohen 1997), it was revealed that when men experience anxiety about their partner in their ongoing relationship, they tend towards watching television and therefore to parasocial interaction, whereas women tend to engage in parasocial interaction to get more social support when they think their relationship is going well.

In addition to the studies conducted with women, another frequently researched sample is adolescents. Cohen (1999) stated that adolescence is a developmental period in which parasocial interaction can be experienced intensively because the importance of the family decreases among adolescents (Cramer 2001), loyalty to friends increases (Steinberg and Silverberg 1986), so the tendency of adolescents to see media characters as friends increases. Numerous studies with adolescents (Harper and Marshall 1991, Cohen 2003, Theran et al. 2010, Aytulun 2015) emphasized that especially female adolescents develop more parasocial bonds than their male counterparts. For example, a study with girls in adolescence (Theran et al. 2010) revealed that 94% of the participants have a media character they were interested in. According to Cohen (2003), this finding is mostly related to girls in adolescence having more difficulties with interpersonal relations and family problems than boys (Harper and Marshall 1991), and girls tend to establish more parasocial interaction to compensate for these difficulties. In addition,
McCutheon et al. (2002) suggested that parasocial interaction (for example, seeing the media character as a friend, feeling sorry or rejoicing for him/her) is more frequently observed among young people.

Similarly, both the level of parasocial behavior and emotional reactions in the case of parasocial breakup, such as the leaving of the media character from the series, are more intense in the adolescents compared to adults (Cohen 2003, Giles 2002). In the study of Aytulun (2015) conducted with adolescents in our country, it was found that 15-year-olds developed more parasocial bonds with characters of the series compared to 18-year-olds. As Cohen (1999) notes, this may be related to adolescents' viewing of media characters as their friends. It is also emphasized that the parasocial bonds that adolescents establish with the characters in the media are essential for their self-development (Giles and Maltby 2004) because media characters can be idols or role models for them (Greene and Adams-Price 1990, Hinerman 1992). Adolescents who choose media characters as their role models or develop parasocial bonds with the media character thus, in a way, both rehearse for their future relationships (Greene and Adams Price 1990, Hinerman 1992) and create their schemes for sexual and romantic issues (Arnett 1995). In the study of Heilman (1998) with adolescents, it was reported that a participant with the nickname "Black" chose Kate Moss as a role model and wanted to become a model like her in the future. In addition, "Black" started dieting to resemble Kate Moss and became anorexic. In other words, media characters may also affect adolescents' perception of the body. In some studies (Groesz et al. 2002, Dittmar and Howard 2004), negative body perception has been found to be associated with thin media characters. In short, during adolescence, it can be stated that both accepting media characters as role models and the parasocial interaction with them are important. Some studies indicate that the parasocial interaction decreases with increasing age (Larsen 1995, Ashe and McCutheon 2001, Giles 2002, McCutheon et al. 2002, Rosaen and Dibble 2008), as well as studies that state that there is a positive relationship between age and parasocial interaction (Levy 1979 Gleich 1997). The authors explain this with the decrease of social supports in old age. It has also been demonstrated that parasocial interaction is associated with low self-esteem (Turner 1993, Derrick et al. 2008). In these studies, it was seen that individuals get closer to their ideal selves by interacting with their favorite media characters in a parasocial interaction, and in this way they have a more positive self-perception. Similarly, media characters play an important role in the development of adolescents' gender roles by offering different selves to adolescents (Larson 1995, Giles and Maltby 2004).

**Digital developments, social media, and parasocial interaction**

One-sidedness is at the forefront in parasocial interaction because the viewer is near the media character through parasocial interaction, but the media character is not even aware of this situation. On the other hand, with the widespread use of the internet and social media today, individuals can comment on and like the posts of influencers (person with the potential to influence a particular audience with the number of followers on social media) they follow. This liking makes the one-way nature of the parasocial relationship established with the characters or celebrity in the traditional media, more interactive and somewhat mutual, even if the reciprocity rate is still uneven. (Chung and Cho 2017).
For example, Youtube, one of the social media platforms, offers the opportunity to watch videos anywhere, anytime, and this causes an increase in the diversity of media characters with which parasocial relations are established (Madison and Porter 2016).

Similarly, Chen (2016) has examined the parasocial relationships developed with the people on YouTube videos and observed that viewers often establish relationships with them. This finding is explained by the fact that videos on YouTube contain elements from daily life, similar cultural values and are easily accessible. In another recent study (Kim and Song 2016), the parasocial relationship with media characters on Twitter has been addressed, and it has been concluded that the media characters’ sharing of information about work, private life and family life through Twitter has increased the parasocial bonds established with them. Vonderohe (2016) states that because Twitter provides ease of access to the actor and actresses and programs followed, the parasocial relationship between followers and celebrities is strengthened.

Conclusion

Although the first studies on parasocial interaction focused on the relationship established with newscasters or media characters in TV series, today there are studies dealing with parasocial interaction in different mass media (eg, Vonderohe, 2016). It can be expected that as the mass media vary with digital and technological developments, the features of parasocial interaction will gain different functions and dimensions. In studies that emphasize the similarities between parasocial interaction and social relationships, it was revealed that parasocial interaction was established based on volunteering, such as friendship (Branch et al. 2013). Similar to social relationships, it was observed that people had a social interaction with the media characters they found similar to their past life, attitude, and physical appearance. (Turner 1993). Besides, many studies have been conducted showing that socially anxious individuals who cannot obtain gratification from interpersonal relationships compensate this gap through parasocial interaction. (Finn and Gorr 1988, Turner 1993, Tsao 1996, Schiappa et al. 2007, Aytulun 2015). Studies have also supported that individuals with loneliness have a higher tendency to have parasocial interaction (Perse and Rubin 1990, Chory-Assad and Yanen 2005, Davila-Rosado 2006, Wang et al. 2008, Greenwood and Long 2009, Dhand 2011). Therefore, it is possible to say that socially anxious and lonely individuals meet their communication needs by using the parasocial interaction and that social interaction has positive effects in this sense. On the other hand, increased interaction with the media character can be considered as a situation that reinforces isolation in individuals. In short, in relevant studies, parasocial interaction is mostly considered as a result variable. It will be useful to address the cause-effect relationship in later studies. In addition, it will be beneficial for mental health professionals working in the field to act by considering these findings.

In some studies in which parasocial interaction is evaluated in terms of gender, it was concluded that women engage in more parasocial interaction (Perse 1990, Tsao 1996, Cohen 2003, Eyal and Rubin 2003, Theran et al. 2010, Lather 2011). As mentioned earlier, the bond that women establish with the characters in the series may affect their expectations about relationships such as asking for a husband similar to the ones in the series, and may lead to unhappiness in close relationships such as marriage (Batıgün and Sunal 2017). These findings help assist policymakers and family professionals. Age-
related research, which is one of the most studied variables with parasocial social interaction, has revealed that adolescents, especially female adolescents, form more intense parasocial bonds (Harper and Marshall 1991, Cohen 2003, Theran et al. 2010, Aytulun 2015). Some researchers explained this situation with friendship being critical in adolescence. There are also studies linking that girls establish more parasocial bonds than boys, girls experience more difficulty with interpersonal relationships and family problems than boys during adolescence and tend to have more parasocial interaction to compensate for this (Harper and Marshall 1991). In addition to this situation, there are also studies showing that negative body perception is associated with weak media characters during adolescence (Groesz et al. 2002).

In summary, it can be said that parasocial interaction plays an important role in adolescence. These studies have the feature of guiding parents and family professionals. All these findings mentioned above can also be informative for researchers working in the media field. This issue will be better understood with the increasing number of studies on parasocial interaction in the future.

References


**Authors Contributions:** All authors attest that each author has made an important scientific contribution to the study and has assisted with the drafting or revising of the manuscript.

**Peer-review:** Externally peer-reviewed.

**Conflict of Interest:** No conflict of interest was declared by the authors.

**Financial Disclosure:** The authors declared that this study has received no financial support.