









Does being close to someone with gambling problems predict harm? An eight-wave longitudinal study

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ABSTRACT

According to existing research, problematic gambling indirectly impacts 6–9 others per gambler. These affected others have been found to experience psychological and physical health problems and difficulties with addictive behaviors similar to those faced by gamblers. Studies assessing the relationship between being an affected other to a gambler and experiencing problems have mostly been based on cross-sectional samples, making long-term effects uncertain. To overcome this shortcoming, we used eight-wave longitudinal data ($N = 1530$, 50 % male) to examine whether being an affected other predicts harm in terms of alcohol use, gambling problems, and psychological distress. Dynamic panel data modeling with full information maximum likelihood was employed to analyze the associations among individuals. First, we assessed the associations in general, then conducted cross-lagged models to examine whether being an affected other predicted the harm outcomes. The results showed that being an affected other predicted gambling problems but not problematic drinking or psychological distress. The associations varied depending on the type of relationship the affected other had with the gambler. Having a parent, grandparent, or sibling with a gambling problem predicted the respondent's own gambling problems, but the direction of this association was inconsistent. Nevertheless, the findings indicate that a family member or friend's problematic gambling can influence one's own gambling behavior.

1. Introduction

Recently, interest in gambling-related harm from the perspective of affected others has grown among scholars (Browne et al., 2017, 2020). On average, one person's problematic gambling impacts six other people, and even low- and moderate-risk gambling can have harmful effects on those around them. (Goodwin et al., 2017). In Finland, approximately 13 % of the population has reported knowing someone with a gambling problem and almost 6 % is concerned about a family member (Castrén et al., 2021). Of those who knew someone with a gambling problem, almost half (42 %) reported experiencing emotional, relationship-related, and financial harm (Castrén et al., 2021). According to Castrén et al. (2021), 5 % of Finnish and Swedish participants were affected by someone else's gambling.

Various definitions have been employed to describe individuals who are close with someone experiencing a gambling problem. In this study, we use the term *affected other*, which includes immediate family members, such as spouses, partners, parents, and children, as well as friends

and distant relatives (Lind et al., 2022). Prior research has indicated that the way in which an affected other experiences someone else's gambling behavior is a key factor in the emergence of harm (Malkin, 2024). Thus, this research focuses on the experience of being an affected other, specifically examining participants' self-assessments of whether someone close to them has or has ever had gambling problems. We base this approach on the subjective experience of being an affected other rather than on objective confirmation of gambling problems or a diagnosed gambling problem, thereby accounting for lived experiences and ensuring accurate evaluation of harm.

The harm experienced by an affected other differs depending on their relationship with the perceived problem gambler. In their meta-synthesis, Riley et al. (2018) found that most gambling-related harm affected those living in the same household as the gambler, with partners and children particularly vulnerable in terms of mental and physical health. Similarly, Castrén et al. (2021) suggested that, overall, most harm to affected others occurred among individuals whose (former) partners or children struggled with gambling.

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The harm experienced by affected others, including poor physical and mental health, emotional distress, and high levels of stress, are analogous to those faced by people with a gambling problem (Castrén et al., 2021; Lind et al., 2022; Riley et al., 2021; Salonen et al., 2014). Affected others are twice as likely to experience psychological distress as nonaffected individuals (Lind et al., 2022). Being an affected other has also been strongly associated with smoking and risky alcohol use (Lind et al., 2022; Riley et al., 2021; Salonen et al., 2014). Moreover, being an affected other has been associated with problematic gambling engagement (Lind et al., 2022; Salonen et al., 2014). Wilson et al. (2024) found that at-risk gambling is twice as likely among affected others compared to nonaffected individuals, highlighting how affected others have a risk of experiencing harm not only from someone else's gambling but also from their own gambling.

Since the harm experienced by affected others has been recognized, research on this phenomenon has expanded (Riley et al., 2021). However, most of this research has been cross-sectional, with only two longitudinal studies identified in a recent review (Dowling et al., 2022). In the first one, Svensson et al. (2013) found that affected others had poorer mental health and riskier alcohol use than the general population. Although their study tracked changes over time, it could not determine whether these changes were linked directly to being an affected other, to preexisting vulnerabilities, or to other factors. In the second one, Tulloch et al. (2021) discovered that being an affected other and one's gambling behavior both decreased respondents' well-being. Additionally, Tulloch et al. (2023a) found a causal link between being an affected other and financial and relationship harm but failed to find significant longitudinal effects on general health or life satisfaction. Therefore, more longitudinal research is needed to understand how the harmful experiences of affected others develop and persist and to examine preexisting vulnerabilities.

The current study uses longitudinal panel data and dynamic panel data modeling to investigate the psychological and behavioral harm of affected others and the directions of the relationships between these measures. This study contributes to the literature on harm experienced by people close to individuals who struggle with addiction, which includes a considerable proportion of the adult population. The harm experienced by affected others also has a social cost (Hautamäki et al., 2025; Wardle et al., 2018), which makes this topic important for public health services and policymakers. Our research questions are as follows:

- Does being an affected other of a person with perceived gambling problems predict psychological and behavioral harm?
- Does harm vary based on the relationship between the affected other and the gambler?

2. Methods

2.1. Participants

This study utilized longitudinal survey data from the Gambling in the Digital Age –project (Oksanen et al., 2022). The survey was initially conducted in spring 2021 (time point T1, $N = 1530$), with subsequent waves conducted every six months until Wave 8, which took place in fall 2024. The data were collected as follows: T2 ($n = 1198$, response rate: 78 % of T1 respondents), T3 ($n = 1095$, 72 %), T4 ($n = 1004$, 66 %), T5 ($n = 934$, 61 %), T6 ($n = 889$, 58 %), T7 ($n = 873$, 57 %), and T8 ($n = 824$, 54 %). The sampling, recruiting, and administration of the survey were managed by Norstat, a data collection company, upon request by the research group. Norstat recruited the participants from its online panel of volunteers and provided only anonymized data for research use. The participants included in the survey were aged 18–75 years at T1, lived in mainland Finland, and spoke Finnish. As compensation for their participation, the respondents were offered Norstat coins. The mean age at T8 was slightly higher than at T1 (54.2 vs. 46.7 years). However, an analysis of the participants' sociodemographic characteristics, including

gender, education level, and geographical area, showed that the sample matched the Finnish adult population (Oksanen et al., 2022).

Attrition in the data was examined. Minor differences were identified between the overall dataset and the groups that participated at each time point (complete cases). In the overall dataset, 50 % of the participants were male and 49 % were female; in the complete cases, 52 % of the respondents were male and 48 % were female. The mean Problem Gambling Severity Index (PGSI) score for the entire dataset was 1.09, and it was 0.94 in the complete cases. The mean score of the Alcohol Use Disorders Identification Test-Consumption (AUDIT-C) was 3.4 for both data groups. The psychological distress measure had a mean value of 12.2 for the entire dataset and 11.8 for the complete cases.

2.2. Measures

Being an affected other was measured with one question. At the first timepoint (T1), the respondents were asked if someone close to them had ever experienced gambling problems. From the second timepoint onward, the same question inquired about gambling problems experienced in the last six months. Participants could select multiple options based on who they perceived the close person with gambling problems to be, including “father,” “mother,” “sibling,” “partner,” “grandparent,” “child,” or “friend.” These options were categorized into three different variables: (a) a partner or the respondent's child or children; (b) another family member, including a parent, grandparent, or sibling; and (c) a close friend.

Psychological distress (a measure of psychological harm) was assessed using the five-item Mental Health Inventory (MHI-5; Cuijpers et al., 2009), which includes items on the participant's emotional and psychological states during the previous month (e.g., “In the past four weeks, how often have you felt downhearted and blue?”). The answers are given on a scale ranging from 0 (“none of the time”) to 5 (“all of the time”). The total scores range from 5 to 30, with higher scores indicating higher levels of distress. The scale demonstrated good internal consistency at each time point (McDonald's $\omega = 0.87$ –.89).

Individuals' own gambling problems were measured using the widely used and psychometrically valid PGSI (Currie et al., 2010; Gorenko & Konnert, 2023; Raisamo et al., 2015). This measure consists of nine items designed to assess various aspects and consequences of problem gambling, including financial difficulties and feelings of guilt related to gambling and the impact of gambling on personal relationships. The responses are rated on a scale from 0 to 3 (0 = “never,” 1 = “sometimes,” 2 = “most of the time,” and 3 = “almost always”). The total scores range from 0 to 25. According to McDonald's ω values, the internal consistency of the PGSI measure was high at each time point ($\omega = 0.93$ –.95).

Problematic drinking was assessed using the three-item AUDIT-C (Bush et al., 1998). The items of this test generate risk scores ranging from 0 to 12, with higher scores indicating problematic alcohol use. This measure has been validated in numerous studies across diverse populations, demonstrating its reliability and effectiveness in assessing problematic drinking habits (Duffy et al., 2023; Lundin et al., 2015). The measure demonstrated high internal consistency across the different time points ($\omega = 0.81$ –.84).

Age and gender were used as sociodemographic control variables. Gender was examined as a time-invariant variable. Since different social trajectories have been associated with harm to affected others (Cowlshaw et al., 2016; Tulloch et al., 2023a), social belonging was included as a control variable to account for the social aspects. Social belonging was measured using the Social and Emotional Loneliness Scale for Adults (SELSA; DiTommaso & Spinner, 1993). The SELSA scale includes three different subscales that consist of nine statements on family, friends, and romantic partners. Responses are given on a scale of 1 (“strongly disagree”) to 7 (“strongly agree”). The total scores range from 9 to 63. Internal consistency was high across the different time points ($\omega = 0.79$ –.83).

2.3. Statistical analysis

Dynamic panel data modeling was used to analyze the relationships between being an affected other and experiencing harm. We employed the `xtpdml` command in Stata 18 (Allison et al., 2017; Williams et al., 2018). This method is based on linear structural equation modeling with maximum likelihood estimation (FIML; Allison et al., 2017; Moral-Benito, 2018) and has several strengths for analyzing panel data. In addition to simplifying the model specification, dynamic panel data modeling allows for time-invariant variables and utilizes FIML to address missing data. In the analysis, being an affected other was considered an independent variable predicting harm pertaining to gambling problems, problematic drinking, and psychological distress (dependent variables). Being an affected other was categorized based on who the person with perceived gambling problems was. Using the same approach as dynamic panel data modeling, we ran a separate model for each harm outcome. All the results are presented in Table 2. FIML was utilized because it allows researchers to effectively acknowledge missing values and attrition in the data. It employs probabilities calculated from the data to predict missing values, which creates an opportunity to use all the data (Moral-Benito et al., 2018; Williams et al., 2018).

The models were standardized to have a mean of zero and a standard error of one, which made the variables more consistent with each other over time (Williams et al., 2018). Postestimation analyses of the models were conducted using the following goodness-of-fit measures: root mean square error of approximation (RMSEA), the Tucker–Lewis index (TLI), and the comparative fit index (CFI; e.g., Xia & Yang, 2019). These values are presented together with the results in Table 2. The cut-off criteria for model fit were above 0.95 for the CFI and TLI and below 0.06 for RMSEA (Hu & Bentler, 1999).

To obtain even more specific information on the directions of the associations between being an affected other and the harm outcomes, cross-lagged effects were examined. In contrast to the overall dynamic panel data models, which examined the within-person effects among all time points, the cross-lagged analysis distinguished the within-person effects between different time lags. In other words, this analysis examined the associations among individuals in a certain period and showed whether the independent variables at the previous time point could predict the outcome variables at the subsequent time point. Time lags of

six months (L1) and one year (L2) were used. The models also considered the previous values of the dependent variables as predictors, meaning that the prior values of the dependent variables were controlled for in the models, and only direct associations between the dependent and independent variables across each time point were observed. This allowed us to make cautious inferences about causality. The results of the cross-lagged analysis are presented in Table 3.

3. Results

Across the eight timepoints, 8.9 % (combined $n = 1085$) reported having someone close to them with perceived gambling problems. The descriptive statistics (Table 1) showed that 21 % of the participants at T1 reported being close to someone with perceived gambling problems, while those who reported being close to such a person over the previous six months, that is, between Timepoints 2 and 8—ranged from 12 % to 10 %. Having a friend with perceived gambling problems was the most common response. Regarding the harm measured (gambling problems, problematic drinking, and psychological distress), the mean values showed a slight decrease across the time points.

The results of the dynamic panel models (Table 2) showed that problematic drinking and psychological distress were not directly associated with being an affected other. Being an affected other was associated only with the respondents’ own gambling problems, and the associations depended on who the person with perceived gambling problems was. Having a parent, grandparent, or sibling ($\beta = 0.06, p < 0.001$) or a close friend ($\beta = 0.03, p < 0.001$) with perceived gambling problems increased the probability that the participant also had such problems. Having a partner or child with perceived gambling problems was not associated with the respondent’s gambling problems in these models. Other factors, such as previous gambling problems, problematic drinking, and psychological distress, were more strongly associated with gambling problems than being an affected other. Furthermore, male gender predicted gambling problems ($\beta = 0.043, p = 0.004$), while a sense of belonging to family and friends protected against them ($\beta = -0.045, p = 0.003$).

The associations between being an affected other and gambling problems were examined more specifically by analyzing the cross-lagged effects. This revealed that during a period of six months,

Table 1
Descriptive statistics of the data at the eight timepoints (N = 1530 in T1).

Categorical variable		T1	T2	T3	T4	T5	T6	T7	T8
		% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)
AO (total)		21.2 (324)	12.0 (143)	11.4 (125)	11.9 (119)	11.0 (103)	11.5 (102)	10.4 (91)	9.5 (78)
AO: Spouse or child with GP		4.8 (74)	2.3 (28)	2.6 (28)	2.4 (24)	2.3 (21)	2.7 (24)	2.9 (25)	2.2 (18)
AO: Parent, grandparent, or sibling with GP		7.5 (114)	3.4 (41)	3.6 (39)	3.9 (39)	3.8 (35)	3.8 (34)	3.7 (32)	2.8 (23)
AO: Friend with GP		10.1 (155)	7.2 (86)	5.8 (63)	6.3 (63)	5.8 (54)	5.9 (52)	5.0 (44)	5.0 (41)
Gender (male)		50.3 (770)	50.1 (607)	50.1 (549)	50.4 (506)	50.5 (472)	50.2 (446)	50.4 (440)	50.6 (417)
Continuous variable	Range	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
Problematic drinking	0–12	3.6 (2.7)	3.5 (2.7)	3.4 (2.7)	3.4 (2.7)	3.4 (2.7)	3.3 (2.7)	3.3 (2.6)	3.3 (2.7)
GP	0–25	1.3 (3.3)	1.2 (3.2)	1.2 (3.2)	1.1 (2.9)	1.0 (2.8)	0.9 (2.6)	0.9 (2.7)	0.9 (2.9)
Psychological distress	5–30	12.4 (4.7)	12.3 (4.5)	12.4 (4.5)	12.3 (4.5)	12.0 (4.6)	12.0 (4.4)	12.1 (4.6)	12.0 (4.5)
Social belonging	9–63	48.5 (11.7)	48.0 (11.8)	47.4 (11.8)	48.0 (12.0)	48.1 (11.8)	47.8 (12.2)	48.0 (12.4)	48.3 (12.1)
Age	18–75 (T1)	46.7 (16.4)	48.9 (16.1)	49.7 (16.2)	50.7 (15.9)	51.9 (15.4)	53.0 (15.3)	53.5 (15.3)	54.2 (15.4)
Total		1530	1198	1095	1004	934	889	873	824

Note. AO = affected other, GP = gambling problems, M = mean, SD = standard deviation.

Table 2
Dynamic panel data models for harm experienced by affected others (N = 1530).

Harm experienced by the affected other	Problematic drinking	Gambling problems	Psychological distress
L1	0.229***	0.397***	0.140***
Problematic drinking		0.115***	0.129**
Gambling problems	0.062***		0.127***
Psychological distress	0.044***	0.083***	
Social belonging (SELSA)	0.027*	-0.045**	-0.093***
AO: Spouse or child with GP	0.005	0.017	0.382
AO: Parent, grandparent, or sibling with GP	0.008	0.063***	-0.121
AO: friend with GP	-0.008	0.033***	-0.049
Age	0.364	0.060	0.004
Gender (male)	0.179***	0.043**	-0.669***
Postestimation			
RMSEA	0.023	0.042	0.016
CFI	0.979	0.909	0.984
TLI	0.974	0.892	0.981

Note. * $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$. AO = affected other, GP = gambling problems. L1 = previous values of the dependent variables.

having a parent, grandparent, sibling, or a friend with perceived gambling problems predicted changes in the respondent's own gambling problems. Over a period of one year, having a family member with perceived gambling problems predicted the respondent's gambling problems. However, these associations were negative, indicating that having a close one experiencing gambling issues *decreased* the respondents' gambling problems within a year. Having a close friend with gambling problems no longer predicted gambling behavior over a period of one year. Moreover, problematic drinking, psychological distress, and previous gambling behavior (L1 and L2) predicted gambling problems more strongly than being an affected other. The cross-lagged analysis was also conducted with problematic drinking and psychological distress, but no significant effects of being an affected other were identified (See Table 3).

4. Discussion

This study, based on four-year panel data, aimed to examine whether being an affected other to someone with perceived gambling problems, predicts harm in terms of alcohol use, gambling problems, and psychological distress. Temporal effects were assessed in terms of behavioral and psychological harm. The perception of being an affected other did not predict problematic drinking or psychological distress in any of our models, although they have been associated with the experience of being an affected other in prior research (Svensson et al., 2013; Tulloch et al., 2023a). Instead, our results partly align with previous longitudinal evidence showing no temporal effects of being an affected other on alcohol use or well-being trajectories and suggest that these outcomes

Table 3
Dynamic panel data models with cross-lagged effects within six months and one year (N = 1530).

Cross-lagged effects for gambling problems	Six months (L1)	One year (L2)
Gambling problems L1	0.411***	0.379***
Gambling problems L2		0.214***
Problematic drinking	0.118***	0.138***
Psychological distress	0.083***	0.092***
Social belonging	-0.046**	-0.053**
AO: Spouse or child with GP	-0.016	-0.031**
AO: Parent, grandparent, or sibling with GP	-0.024*	-0.025*
AO: Friend with GP	-0.020*	-0.007
Age	0.077	0.171
Sex (male)	0.039*	0.010

Note. L1 = cross-lagged effects within six months, L2 = cross-lagged effects within one year, AO = affected other, GP = gambling problems. * $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$.

may not be directly caused by the experience itself.

In this study, the primary harm associated with being an affected other was the respondent's own gambling problems, as measured by the PGSI. Such gambling problems were the only harm predicted by being an affected other in our analysis and, in the overall models (presented in Table 2), they were associated with higher problematic drinking and psychological distress, demonstrating that gambling is related to various harm, as also shown by other scholars (Dowling et al., 2022; Lind et al., 2022; Riley et al., 2021). Together, these results align with previous research indicating that heavy alcohol use, psychological distress, and gambling problems often co-occur (Nower et al., 2022; Suomi et al., 2014). Although it is not possible to verify the directions of these associations based on our analysis, the results suggest that being an affected other relates to engaging in harmful behaviors and experiencing distress.

Additionally, the direction of the relationship between being an affected other and problematic gambling remains inconclusive. When we considered delimited timeframes (six months and one year), the relationship between being an affected other and a close one's gambling problems turned negative. Specifically, the results indicate that being an affected other decreased the respondents' gambling problems over a one-year time span. Being close to a person with perceived gambling problems might initially discourage individuals from gambling, perhaps due to witnessing the negative consequences experienced by the gambler.

Existing evidence indicates that the more negatively someone perceives a close one's gambling behaviors, the greater the potential harm they face, especially when it comes to the emergence of gambling problems (Cheung, 2015; Malkin, 2024). Reflecting this in light of our results, even if an individual perceives someone close to them as having gambling problems, the situation may not always be experienced negatively. This could be explained by the normalization of gambling behavior through social connections (Russell et al., 2018). Viewing gambling behavior, even when causing problems, as normal and part of life might mitigate the negative emotions experienced by an affected other, and thus prevent the emergence of potential harm, explaining our results.

Our findings suggest a temporal shift, wherein individuals that are connected to someone with perceived gambling problems may become increasingly likely to engage in gambling over time. This shift might happen because the affected others learn about gambling through their close contact with the gambler, which encourages them to engage in the activity. Using the overall models, the direction of the association could not be accurately assessed; hence, it is possible that the association is reciprocal, meaning that individual's gambling problems may influence and be influenced by those close to them. Additionally, those with problematic or risky gambling habits may have a higher threshold for recognizing gambling issues in others, potentially turning the relationship between being an affected other and problematic gambling negative in our results.

This study is based on robust analyses and a large longitudinal dataset; however, it has some limitations. Variables not considered in our models may have impacted the relationships as mediating or moderating factors. For example, financial harm (hardship) was not included in the models, but Wilson et al. (2024) suggested that the association between being an affected other and low mental health is mediated by financial difficulties. Evidence also indicates that different social trajectories might play a role in the associations between being an affected other and related harm (Russell et al., 2018; Tulloch et al., 2023a). In the present study, the SELSA measure was used to control these social trajectories. Gambling might connect similar people, which could explain the result that being an affected other of a friend with perceived gambling problems predicted one's own gambling problems as well. Furthermore, gambling is normalized through social connections (Russell et al., 2018), which explains the importance of a family member's perceived gambling problems as a predictor of potential at-risk gambling. These aspects were not fully considered in our study,

but the mediating and moderating roles of social trajectories in the temporal effects on different health and behavioral harm are important topics for future research.

Contradicting our findings, recent cross-sectional studies have linked being an affected other to higher psychological distress (Suomi et al., 2024; Tulloch et al., 2023b). Although our study did not reveal significant direct associations, relevant connections may exist. Since our analysis discounted mediational effects, it is possible that risky drinking and psychological distress are more of an immediate reaction to someone else's perceived gambling problems. Thus, despite causing instant harm, being an affected other was not shown to directly predict higher alcohol use or distress in our models over a longer period. Studying how quickly the harm emerges for the affected other is an important topic for future research. Affected others might also have assumed responsible roles and tried to cope with the situation. Research indicates that effective coping strategies and strong social support can mitigate the negative consequences of being an affected other (Tulloch et al., 2025; Dowling et al., 2025).

The quality of relationships may also affect these associations. According to our results, the temporal effects between being an affected other and gambling problems depended on the type of relationship between the affected other and the perceived gambler with related problems; having a family member (parent, grandparent, or sibling) with perceived gambling problems was the strongest predictor of one's gambling problems. This finding is partly supported by the meta-synthesis of Riley et al. (2021), who found that the children of problem gamblers were more prone to health-related harm. In the present study, our models did not measure the closeness and supportiveness of the relationship between the affected others and the perceived gamblers. However, recent research has suggested that the closer the relationship between the affected other and the gambler, the more harmful the experience of being an affected other seems to be (Tulloch et al., 2023b). Most harm have been shown to come especially to those with high financial closeness and shared responsibilities in everyday life with problematic gamblers, such as spouses and ex-spouses (Tulloch et al., 2023b). Changes in the degree of closeness in the relationship between the person and the gambler may also influence how the impact of being an affected other evolves over time. It is also important to note that since we used categorical variables addressing affected others, some information may have been lost. For instance, it is possible that combining spouses and children into one category in our analyses could have affected the results and explain why these affected others were not associated with the harm examined in the first models.

Gambling is not a solitary activity, no matter how discreet people may wish it to be. Someone else's gambling problems can become a great burden on those around them. At the least, it influences the gambling behavior of family members, possibly increasing the potential consequences within the family. Therefore, interventions and reduction or prevention plans should pay as much attention to affected others as to individual gamblers.

CRedit authorship contribution statement

Sari Hautamäki: Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Conceptualization. **Iina Savolainen:** Writing – review & editing, Writing – original draft, Funding acquisition, Data curation, Conceptualization. **Emmi Kauppila:** Writing – review & editing, Writing – original draft, Conceptualization. **Ilkka Vuorinen:** Writing – review & editing, Writing – original draft, Conceptualization. **Heli Hagfors:** Writing – review & editing, Writing – original draft. **Atte Oksanen:** Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Funding acquisition, Data curation, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Ethics Approval: The ethics committee of the Tampere region in Finland declared in their 2021 statements that the protocols for this research did not present any ethical issues (Statement 24/2021).

Data availability

Data will be made available on request.

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