

# Phubbing: a narrative review

## Abstract

The term phubbing was coined as a blend of the words phone and snubbing someone during an interaction by looking at, talking and/or texting on one's phone instead of continuing to interact with that person. Although this term first appeared several years ago (2012), the research literature has been primarily dated from 2020 to the present. In a recent survey at least 47% of individuals in many countries have experienced phubbing. Its negative effects on adolescents and adults include social media addiction, smart phone addiction, poor job performance, negative affect, psychological distress and depression. Phubbing has also negatively affected romantic relationships and life satisfaction. Phubbing by parents has had negative effects on preschoolers, school-age children and adolescents including excessive screen media use /internet addiction in the youth as well as internet gaming addiction, peer alienation, depression, aggressive behavior and online hostility (cyber flaming). Predictors/risk factors for phubbing include excessive social media, smart phone addiction, poor romantic relationships, "fear of missing out", nomophobia, boredom, loneliness, anxiety, depression, extraversion, negative body image, neuroticism and narcissism. The data have been limited not only by being based on self-report but also by deriving from cross-sectional studies that cannot determine directionality of effects, and interventions and research on underlying mechanisms have not appeared in this recent literature on phubbing.

**Keywords:** phubbing, parents, preschoolers, adolescents, relationships

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## Introduction

Phubbing (phone snubbing) is prevalent among many adults including coworkers, friends and partners. It is also prevalent among parents. The prevalence of phubbing is not surprising given that 6,567 billion people had smart phones in 2021.<sup>1</sup> This prevalence is expected to increase to 7,690 billion by 2027. In the U.S., half of those people reported using Smart phones at least 5 to 6 hours per day on average.

Phubbing has many negative effects. For example, social media addiction has resulted as well as poor job performance. Emotions have also been negatively affected including feelings of rejection in children, poor romantic relationships in young adults, poor life satisfaction, negative affect that can lead to psychological distress which, in turn, can lead to severe depression. Despite the prevalence and severity of these problems, there is very limited research on phubbing and virtually no interventions to reduce phubbing and its negative effects. The purpose of this paper is to summarize the research on the negative effects of phubbing and the risk factors for phubbing that can inform future research and interventions.

## Methodology

This narrative review summarizes 41 papers on phubbing (phone snubbing) by adults that were derived from a search on PubMed and PsycINFO entering the terms phubbing and the years 2019-2024. Exclusion criteria for this review included papers on proposed protocols, case studies, and non-English language papers. The publications can be categorized as the negative effects of phubbing on adolescents and adults, the negative effects of parents' phubbing their youth and predictors/risks factors for phubbing. This review is accordingly divided into sections that correspond to those categories. Although some papers can be grouped in more than one category, 10 papers are included on the negative effects of phubbing on adolescents and adults, 13 on the negative effects of parents' phubbing on their

youth and 23 on predictors/ risk factors for phubbing. These sections are followed by a discussion on the methodological limitations of this literature.

## Negative effects of phubbing on adolescents and adults

Phubbing has many negative effects on adolescents and adults (see Table 1). They include social media addiction as well as poor job performance. Emotions have also been negatively affected including negative affect, psychological distress and severe depression.

**Table 1** Negative effects of phubbing on adolescents and adults (and first authors)

Negative effects	First authors
Social media addiction	Xu
Smart phone addiction	Zhao
Poor job performance	Xu, Yao
Poor romantic relationships	Karaman
Poor life satisfaction	Yam
Negative affect	Garcia
Psychological distress	Maflei, Blachni
Depression	Garredo

**Social media addiction** has reportedly resulted from phubbing in a couple studies. In a survey on phubbing (N= 830 adolescents from China), a direct effect of phubbing was noted on social media addiction.<sup>2</sup> Phubbing also led to loneliness which, in turn, led to **mobile social media addiction**. This relationship was more notable in female adolescents. In a similar study, also from China, phubbing by college students led to **smartphone addiction** during the COVID-19 pandemic (N=1396 students).<sup>3</sup> In this sample, the relationship between phubbing and smartphone addiction was mediated by boredom.

Social media addiction and smartphone addiction have also been studied as predictors/risk factors for phubbing. Combining these studies suggests that these variables are reciprocally related. Most of the research reported in this literature is cross-sectional, making causality difficult to determine. The selection of the variables as effects, mediators, moderators or predictors/risk factors would appear to be arbitrarily determined by the researchers.

**Poor job performance** may be related to social media and smartphone addiction, but it has also resulted from phubbing. In a study from China (N= 246), phubbing by employers led to poor job performance of their employees.<sup>4</sup> This relationship was mediated by social distancing and distrust. The poor job performance was more frequently noted in employees who had a greater need for social approval, which was not surprising.

In a study called “Boss, can’t you hear me? The impact mechanism of supervisor phone snubbing (phubbing) on employee psychological withdrawal behavior”, 302 Chinese employees were surveyed online.<sup>5</sup> Phubbing by the supervisors led to psychological withdrawal and counterproductive work behavior by the employees. These effects were especially true for employees with high interpersonal sensitivity. Causality could not be determined from these cross-sectional data even though phubbing was entered as a causative factor in these data analyses. Interestingly, the authors of these two studies gave different labels to similar behaviors, i.e. “withdrawal” versus “social distancing” and the “need for social approval” versus “interpersonal sensitivity”.

**Poor romantic relationships** have resulted from phubbing just as job relationships have been negatively affected by phubbing. In a study on romantic relationships in students from various universities in Turkey (N= 958), the participants completed the Satisfaction of Basic Psychological Needs in Romantic Relationships Scale, the Generic Scale of Phubbing, the Social Media Addiction Scale and the Relationship Satisfaction Scale.<sup>6</sup> Social media addiction and phubbing were mediators in the relationships between the needs for love/belonging and freedom subscales and relationship satisfaction. Phubbing had a mediating role for all needs other than the need for fun in the relationship between satisfaction of basic psychological needs in romantic relationships and social media addiction. Social media addiction had a mediating role in the relationship between phubbing and relationship satisfaction.

Phubbing has been a predictor variable, a mediating and moderating variable and an outcome variable depending on the researchers’ primary interests. The mediation/moderation analyses have revealed complex relationships between these variables.

**Poor life satisfaction** has resulted from phubbing in romantic relationships, as might be expected. Partner phubbing led to negative life satisfaction in a study entitled “The relationship between partner phubbing and life satisfaction: the mediating role of relationship satisfaction and perceived romantic relationship quality” (N= 308 adults 18-60 years-old, Mean age =31 years-old).<sup>7</sup> In this research, the adults were given the Perceived Relationship Quality Scale, the Satisfaction with Life Scale, the Relationship Assessment Scale, and the Partner Phubbing Scale. The relationship between partner phubbing and negative life satisfaction was mediated by poor romantic relationship quality and relationship dissatisfaction.

Again, in these mediation/moderation analyses that are so prevalent in this literature, researchers have arbitrarily entered mediating and moderating variables. In addition, some of the variables appear to be redundant as in “poor relationship quality” and “relationship dissatisfaction” variables.

**Negative affect** would be expected to result from poor life satisfaction. It has also resulted from phubbing in a study on psychosocial and personality traits associated with phubbing and being phubbed (N=452 Hispanic college students).<sup>1</sup> In this sample both phubbing and being phubbed were mediators that resulted in negative affect, although they also mediated some different behaviors. Specifically, phubbing mediated the relationships between nomophobia, interpersonal conflict, and problem acknowledgment. Being phubbed also mediated interpersonal conflict but in addition it mediated feeling ignored and perceived victimhood. These results were not surprising given that being phubbed versus doing the phubbing would more likely result in feeling ignored and victimized. Both phubbing and being phubbed are rarely differentiated in these studies. The researchers have typically reported on phubbing in general.

**Psychological distress** often accompanies negative affect. Psychological distress has also directly resulted from phubbing. In a paper entitled “Put your phone down! Perceived phubbing, life satisfaction, and psychological distress”, phubbing led to psychological distress.<sup>8</sup> Loneliness was assessed as a mediator for this relationship (N= 720 adults, Mean age=24-years-old). Loneliness mediated the relationship between phubbing and psychological distress.

In a recent review, psychological distress was related to at least one dimension of phubbing (i.e. communication disturbance or phone obsession) based on data from 20 countries (N = 7315).<sup>9</sup> In this review, phubbing was more prevalent in countries with a higher “gender gap index” (gaps that occurred in economic participation, educational attainment, political empowerment and health and survival criteria). Many of the studies in this review were limited by being based on self-report data, by being cross-sectional and by making cross-cultural comparisons of countries that the authors referred to as “WEIRD cultures (western, educated, industrialized, rich and democratic)”. This earlier literature may have been more diverse across cultures than the current literature.

**Depression** can result from psychological distress. Depression has been noted as one of the most severe negative effects of phubbing. In research entitled “Phubbing and its impact on individual psychological well-being”, 370 women and men from Spain (age range = 25 to 60) were given the Phubbing Behaviors Survey.<sup>10</sup> This survey is comprised of 33 items on a 5-point Likert scale that have been categorized on 5 dimensions (cultural, technological, social, communication and psychological). This scale was given as well as the General Health Questionnaire which includes seven items per category on somatic symptoms, social dysfunction, anxiety, insomnia and depression. A significant correlation was noted between phubbing and depression. Young women under 25-years-old showed more somatic symptoms than men of the same age group, which was not surprising given the commonly reported 2 to 1 ratio for depression in women versus men.

### Negative effects of parents’ phubbing on their youth

Parents who engage in excessive phubbing have been the focus of many studies in this literature (see Table 2). The negative effects of excessive parent phubbing on their children/adolescents include problematic internet use and internet gaming addiction in the youth as well as social interaction/relationship problems, depression and aggression. All these relationships have mediating variables which were typically selected by the researchers based on significant correlation analyses effects. Mediation/moderation analyses are prevalent in this literature and they have not only yielded mediation effects but also moderation effects.

**Table 2** Negative effects of parents' phubbing on their youth (and first authors)

Negative effects	First authors
Problematic internet use	Li, Dai, Zhao, Geng, Tang
Internet gaming addiction	Zhou
Peer alienation	Wu
Internalizing/externalizing behaviors	Zhang
Adolescent depression	Wang, Li
Adolescent aggression	Yang
Online hostility (cyber flaming)	Wang

### Problematic internet use and smart phone addiction in children and adolescents

Problematic internet use by children and adolescents has resulted from excessive phubbing by their parents. Mediating variables have included parent-child conflict and relationships with teachers as well as boredom, loneliness and depression in the youth. In a study on excessive electronic media use in young children that resulted from parent phubbing, **parent-child conflict** had a mediating effect and the children's emotional regulation had a moderating effect that reduced that relationship (N=612).<sup>11</sup> These mediator/moderator effects were revealed by structural equation modeling. A similar study but on preschool children was entitled "How parental mediation and parental phubbing affect preschool children's screen media use: a response surface analysis".<sup>12</sup> Based on this database, the use of mediation by the parents as well as a decrease in phubbing by the parents led to less frequent screen time by the preschoolers (N= 3445).

Problematic internet use has also been reported for junior high school students. In a study on junior high school students (N= 495 students 11-15-years-old) that was entitled "Mom and dad, put down your phone and talk to me", problematic internet use resulted from parent phubbing.<sup>13</sup> This association was mediated by **problematic parent-child relationships**.

**Problematic parent-child relationships** have also mediated the relationship between parent phubbing and internet gaming addiction in a study on Chinese children (N=1021, mean age=10).<sup>14</sup> This relationship was also mediated by **depressive symptoms** in the children.

**Boredom proneness** has also been a mediator for the relationship between parent phubbing and smart phone addiction in adolescents (N=931, Mean age=14).<sup>15</sup> In a longitudinal study on Chinese adolescents (N=1447, Mean age=16 years-old), parental phubbing led to problematic smart phone use one year later.<sup>16</sup> In this rare longitudinal study, **loneliness and fear of missing out** in the adolescents were mediators of the relationship between parental phubbing and the later problematic smart phone use.

In still another study on Chinese adolescents, parental phubbing led to smartphone addiction (N= 742).<sup>17</sup> This relationship was mediated by **depression in the adolescents** and moderated by the school environment, which decreased the strength of the relationship

Although parent phubbing has often been based on mothers' phubbing, at least one study has compared mother and father phubbing. In that study on Chinese adolescents (N=441), phubbing by mothers and fathers had different effects.<sup>18</sup> The fathers' phubbing had more negative effects on the **mother-adolescent relationship**, but only for relationships between mothers and female adolescents.<sup>18</sup> In contrast, the mothers' phubbing had a positive effect on **father-adolescent**

**relationships**, but only for males. These interaction effects highlight the complexity of parental phubbing.

**Teacher-student relationships** have fortunately moderated (reduced) the effects of parent phubbing on internet addiction in their youth. For example, in a study on Chinese students (N=1912 fourth to eighth grade students), a negative correlation was reported for the relationship between internet addiction and teacher-student relationships.<sup>19</sup> Those students who had better relationships with their teachers were at lower risk for internet addiction.

### Other negative behavior effects of parental phubbing

Other negative behavior effects of parental phubbing have been reported. These include poor prosocial behavior in preschool children, peer alienation, more internalizing and externalizing behaviors in children and depressed behavior in adolescents.

**Less prosocial behavior** in preschool children has been related to parental phubbing. In a study on preschool children in China (N= 3834) parent phubbing led to less prosocial behavior, which was mediated by poor **parent-child relationships**.<sup>20</sup> **Authoritative parenting** moderated (reduced) that relationship.

**Peer alienation** likely relates to low prosocial behavior. In addition, peer alienation has been reported as an effect of maternal phubbing (N= 1140, mean child age= 12 -years-old).<sup>21</sup> This relationship was mediated by **maternal rejection**. The relationship between mothers' phubbing and mothers' rejecting behavior was greater for female children.

**Internalizing and externalizing behaviors** in children have been significantly related to parental phubbing in a meta-analysis on 42 studies (N=56,275 Chinese children).<sup>21</sup> In this analysis a, a positive association was noted between parental phubbing and **internalizing and externalizing behaviors** in the children.<sup>21</sup> When phubbing was noted in both parents, the externalizing behaviors of the children were more severe. The externalizing behavior could be considered an extreme form of the children's seeking attention from the parents who are phubbing.

**Adolescent depression** which is a form of internalizing behavior has also been reported for adolescents who have been phubbed by their parents. In a study on that association, poor **parent-adolescent communication** mediated the relationship between parental phubbing and adolescent depression (N=4213, mean age =16-years-old).<sup>22</sup> This relationship was stronger for female adolescents.

Father phubbing has led to **adolescent depression** in at least one study (N= 3770 Chinese adolescents, mean age=16-years-old).<sup>18</sup> Perceived **father acceptance** was a mediator of this relationship and adolescent resilience was a moderator that reduced the strength of the relationship between father phubbing and adolescent depression.

**Adolescent aggression** could result from adolescent depression as depression and aggression are often related. Adolescent aggression has also been directly related to parents' phubbing. In a three-year longitudinal study in China, parental phubbing at baseline led to reactive but not proactive aggression at the follow-up assessment (N= 2407 Chinese adolescents).<sup>12</sup> This result was not surprising given that reactive aggression typically occurs in response to an insult like parental phubbing rather than proactive aggression that is usually initiated without an insult.

**Online hostility** could be considered a specific form of adolescent aggression. **Parental phubbing** has also led to **online hostility** (also

called **cyber flaming**) in adolescents (N= 689 Chinese adolescents).<sup>23</sup> This relationship was mediated by perspective-taking and moderated (increased) by male gender.

### Predictors/risk factors for phubbing

Several predictors/risk factors have been identified for phubbing. These include excessive social media use, the fear of missing out, nomophobia (fear of losing your phone), boredom, poor romantic relationships, loneliness, anxiety, depression, and personality factors (Table 3).

**Table 3** Predictors/risk factors for phubbing (and first authors)

Predictors/ risk factors	First authors
Excessive social media	Gao, Ergun, Tanhan, Chu, Lu
Smart phone addiction	Bajwa, Karadog
Poor romantic relationships	Zhan
Fear of missing out	Fang, Butt, Peleg
Nomophobia	Karaduman
Boredom	Dormit, Zhao
Loneliness	Dormit, Ivanova
Anxiety	Ergun
Depression	Ergun, Bitar
Extraversion	Dormit
Negative body image	Kilic
Neuroticism	Santos
Machiavellianism, psychopathy, narcissism	Akat

**Excessive social media use** has contributed to phubbing in at least 5 studies. In a paper entitled “Why mobile social media-related fear of missing out promotes depressive symptoms? the roles of phubbing and social exclusion”, 485 Chinese university students (Mean age = 20 years-old) completed the Mobile Social Media-Related Scale, the Phubbing Scale, the Social Exclusion Scale and the Patient Health Questionnaire.<sup>24</sup> Social media use predicted depressive symptoms with phubbing mediating that relationship and social exclusion moderating (strengthening) that relationship.

In a study on 603 university students, social media addiction led to poor mental health, which was mediated by internet addiction and phubbing.<sup>25</sup> In another mediator/ moderator study, cognitive flexibility mediated and moderated the effect of social media addiction on phubbing (N=385 Turkish university students).<sup>26</sup>

In a paper entitled “Peer phubbing and social networking site addiction: the mediating role of social anxiety and the moderating role of failing financial difficulties”, undergraduates from China were surveyed (N=1401, Mean age=19 years).<sup>27</sup> In this research, social networking led to phubbing.

Problematic social media use has also led to phubbing in a cross-lagged analysis of data from students of four universities (N= 328 Chinese students).<sup>28</sup> In this study, pretest problematic social media use predicted post-test phubbing, but, surprisingly, pre-test phubbing did not predict problematic social media use. In a paper entitled “Determinants of phubbing which is a sum of many virtual addictions: a structural equations model” (N = 409 university students), several addictions were predictors of phubbing including mobile phone addiction, texting, social media and internet addictions.<sup>29</sup>

**Smart phone addiction** has led to phubbing with at least 2 mediators including fear of missing out and social comparison (N= 794 university students).<sup>30</sup> Loneliness as a moderator increased the strength of those relationships.

**Fear of missing out** would be expected to relate to both smart phone addiction and phubbing. In a study entitled “Fear of missing out and problematic social media use as mediators between emotional support, social media and phubbing behavior”, emotional support from social media led to fear of missing out (N=501 Chinese students, Mean age=20 years-old).<sup>31</sup> Problematic social media use and fear of missing out mediated the relationship between emotional support and phubbing. In research that related psychological needs to phubbing, the fear of missing out was a mediator variable (N= 240 Pakistan students, Mean age =21 years).<sup>32</sup>

In a study entitled “Exploring personality and relationship factors that mediate the connection between differentiation of self and phubbing”, females engaged in more phubbing and were also more emotionally reactive than males (N= 431, Mean age= 29 years-old).<sup>33</sup> In this sample, the fear of missing out led to greater anxiety which led to phubbing. The authors interpreted the phubbing as being a coping mechanism to reduce anxiety. Lower levels of “self-differentiation” also led to the fear of missing out which, in turn, led to greater phubbing.

**Nomophobia** (fear of losing a cell phone) is likely related to fear of missing out, although the fear of missing out has not been related to nomophobia in this literature. Nomophobia has been a risk factor for phubbing in at least one study.<sup>6</sup> In this study nomophobia was based on the scale that includes “giving up inconvenience”, “not able to communicate” and “losing connectedness”. Prevalence differences were noted across countries including a greater prevalence of nomophobia in the U.S.

This is one of the only studies that has made cross-cultural comparisons on the prevalence of nomophobia. Cross-cultural differences in phubbing and nomophobia would be expected based on differences in prevalence of smart phone addiction. Most of the phubbing and nomophobia studies have been conducted in China even though the U.S. in this study showed a greater prevalence of nomophobia.

**Boredom** would likely be a frequent reason for turning away from a conversation to use a cell phone. Boredom has been a risk factor either as a predictor or a mediator/moderator variable for phubbing. In a paper entitled “Association between personality traits and phubbing: the co-moderating roles of boredom and loneliness” (N= 461 age 18 to 29), boredom was considered a risk factor along with loneliness.<sup>34</sup> Protective factors included open-mindedness and being married. In a study already mentioned, boredom was a mediator for the relationship between phubbing and smartphone addiction.<sup>3</sup>

**Loneliness** was a risk factor in the study just described.<sup>34</sup> In another paper entitled “Mobile phone addiction, phubbing and depression among men and women: A moderated mediation analysis”, 402 university students from Ukraine were surveyed (17 to 31 years-old).<sup>35</sup> They were given the Adapted Mobile Phone Use Habits Scale, the Phubbing Scale, the CES-D Scale and the Loneliness Scale. Greater mobile phone addiction led to phubbing which led to depression. The moderator variable was loneliness which enhanced the relationship between phubbing and depression. Loneliness was the mediating variable for phubbing in men.

**Poor romantic relationships** have led to phubbing in at least one study.<sup>36</sup> In this research, poor romantic relationships led to phubbing with loneliness being a mediator (N = 504 Chinese students).<sup>36</sup> Empathy was a moderator that increased the strength of this relationship, possibly because of greater awareness of the poor relationships and the feelings of loneliness and rejection.

**Anxiety** has been a risk factor for phubbing as well as for many other addictions. In a paper entitled “Effects of phubbing: Relationships with psycho-demographic variables”, phubbing was predicted by anxiety.<sup>37</sup> Other risk factors for phubbing included depression, negative self-image, somatization, hostility and phone use duration. Anxiety not only predicted phubbing behavior, but it also predicted “being phubbed”.

Phubbing behavior and being phubbed are rarely differentiated in this recent literature. The risk factors for the two behaviors and their negative effects are likely very different. It would also be interesting to study the prevalence of individuals who have been both victims and perpetrators of phubbing.

**Depression** was a risk factor for phubbing in the study just described.<sup>37</sup> That both anxiety and depression were risk factors was not surprising as anxiety and depression are frequently comorbid. Depressed temperament which is considered a precursor of depression led to phubbing in another study (N= 461 individuals 18 to 29 years-old).<sup>38</sup> Low self-esteem mediated the relationship between depressed temperament and phubbing in this sample.

**Personality risk factors** that may have derived from anxiety and depression or predicted anxiety and depression have predicted phubbing. These include extraversion, negative body image, neuroticism and personality factors referred to as the “dark triad”. The dark triad included Machiavellianism, psychopathy and narcissism.

**Extraversion** has been considered a risk factor for phubbing along with boredom and loneliness in a study already described.<sup>34</sup> Extroverts by definition “show a preference for seeking, engaging in and enjoying social interactions”. They may like engaging in multiple interactions simultaneously which could contribute to their phubbing while having an in- person conversation.

**Negative body image** has also been a risk factor for phubbing. In a study entitled “Being virtual in real interpersonal interaction: what makes people prone to phubbing?”, the Phubbing Scale, the Body Image Scale and the General Self-Efficacy Scale were given to college students (N=282 individuals who were greater than 18-years-old).<sup>39</sup> Regression analysis indicated that phubbing was negatively related to body image and self-efficacy. Phubbing was also greater in single versus married individuals in this sample.

**Neuroticism** has been defined as a tendency toward anxiety, depression and other negative feelings, so it is not surprising that it has been a risk factor along with the other already described negative emotions that predict phubbing. In a correlational and predictive study (N= 1551 adults, mean age =32), neuroticism was a risk factor for phubbing.<sup>40</sup> However, as a predictor, neuroticism was confounded by the use of Instagram as another risk factor.

“**The Dark Triad**” including the neurotic experiences called Machiavellianism (manipulation), psychopathy (impaired empathy) and narcissism (self-centeredness) have led to phubbing (N=506, mean age=22).<sup>41</sup> The relationship between the dark triad and phubbing in this sample was mediated by the fear of missing out. These relationships are not surprising as a self-centered person with the fear of missing out might show snubbing which might be viewed as impaired empathy.

### Methodological limitations

This recent literature on phubbing has several methodological limitations that relate to the sampling, variable selection and data analytic methods used by the different research groups. These

limitations are highlighted by the relative absence of meta-analyses in this literature. The samples of children/adolescents have varied on the age range as well as the severity of phubbing effects. The researchers have also focused on phubbing in several different ways including as many different negative effects, as mediating/moderating variables and as predictors/risk factors.

Presumably, there would be cross-cultural differences on the acceptability of phubbing with some countries finding it more acceptable perhaps because of its prevalence and others finding it more disturbing. However, most of the samples are from China which has limited the generalizability of the phubbing data and has limited the ability to make cross-cultural comparisons. Age differences would also be expected. Adolescents may be less disturbed by being phubbed by their peers given its frequency in their school culture. Children may be more disturbed by feeling rejected by their parents’ phubbing. Age comparisons are missing from this recent literature.

The direction of the phubbing, i.e. whether doing the phubbing or being phubbed, would likely have differential effects. The phubber, for example, could be less distressed by the phubbing than the phubbee who might be experiencing the phubbing as a dismissal or a rejection or interpreting the phubbing as the phubber “getting bored by the conversation”. Or, the phubber may be experiencing social anxiety during the conversation and “hides behind the cell phone” as a coping or a defense mechanism. Most of the studies have reported phubbing effects in general rather than distinguishing the differential effects of phubbing versus being phubbed.

The degree or extent of phubbing would also be expected to have differential effects. However, the research reviewed here did not measure the quantity or the quality of the phubbing. Further, the only comparison between phubbing and an active control group was the comparison between folks phubbing on a cell phone (which is the way phubbing has been defined) and reading a magazine that was considered less disturbing.<sup>42</sup> These data were surprising because looking at a magazine might be viewed as a more deliberate behavior that interrupted the interaction but was not necessary while turning to a cell phone might be viewed as a responsive behavior that was necessary.

Most of the studies have been cross-sectional as opposed to longitudinal making directionality difficult to determine. The effects and risk factors may be reciprocal. The same variables, for example, boredom and loneliness have been considered negative effects or risk factors by different researchers, suggesting that these variables are reciprocal. And many of the same variables have been entered as mediators/moderators in mediation/moderation analyses, suggesting that several of the variables are interrelated.

The mediation/moderation analyses that have been used by virtually all the researchers are also problematic. Mediation/moderation analyses provide a way to test mechanisms based on theory. However, the disadvantages of this type of data analysis are its low statistical power in addition to its not directly testing the significance of a specific indirect effect and not quantifying the magnitude of the effects. A stepwise regression analysis or structural equation modeling may be more informative data analyses for determining the relative significance of the multiple risk factors. Determining the degree to which risk factors contribute to the variance in outcomes would also help inform intervention research. No intervention research could be found in this literature, although the term phubbing was coined twelve years ago, and the more recent research has suggested severe effects like adolescent depression and aggression.

## Conclusion

Despite these methodological limitations, this literature has highlighted the prevalence of phubbing. The prevalence may have recently increased as the excessive use of cell phones has increased. The prevalence of phubbing by adolescents, young adults and parents and the negative effects of phubbing have highlighted the need for more intervention research. The studies on predictors/risk factors have helped identify children and adolescents who may need therapy. However, intervention data are needed to inform clinicians on potential treatments for those who have been phubbed. Further research is also needed to specify the relative significance of the phubbing risk factors for identifying those children and adolescents who need intervention and the specific intervention techniques that are effective in reducing phubbing.

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## Conflicts of interest

The author declares that there are no conflicts of interest.

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