**The associations between problematic Facebook use, psychological distress and well-being among adolescents and young adults: A systematic review and meta-analysis**

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**Abstract**

Background: A growing body of research has analyzed the potential risks of problematic Facebook use for mental health and well-being. The current meta-analysis is the first to examine the associations between problematic Facebook use, psychological distress (i.e., depression, anxiety, etc.) and well-being (life satisfaction, positive mental health) among adolescents and young adults. Method: A comprehensive search strategy identified relevant studies in PsychInfo, Pubmed, Scopus, ResearchGate, and Google Scholar.

Results: The final sample included 23 independent samples with a total of 13,929 participants (60.7% females; *M*age= 21.93, range: 16.5-32.4). Results of random effects meta-analysis confirmed a positive correlation between problematic Facebook use and psychological distress (*r* = .34, 95% CI [.28, .39]). Moderation analysis revealed that effect sizes were larger in older samples. Moreover, a negative correlation between problematic Facebook use and well-being was observed (*r* = -.22, 95% CI [-.28, -.15]).

Limitations: All available studies used a cross-sectional design thus hampering the possibility to establish the direction of the association between problematic Facebook use and psychological distress and well-being.

Conclusions: Results are discussed within the extant literature on problematic Facebook use and future research directions are proposed. This research may also inform clinical and prevention interventions on problematic Facebook use.

**Keywords:** anxiety; depression; mental health; meta-analysis; problematic Facebook use; well-being.

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**1. Introduction**

With about 2 billion of users worldwide, Facebook is the most used social networking site (Facebook statistics, 2017). The increasing amount of time people spend using it, the variety of activities people can do on Facebook, and the consequent psychological importance it assumes in people’s life have led researchers to analyze the effect it may have on users’ mental health and well-being (Ryan, Reece, Chester, & Xenos, 2016). Even though social networking sites addiction has not yet been recognized as a legitimate disorder, recent research has indicated that use of social networking sites like Facebook could become *problematic* and be characterized by addictive-type symptoms (Griffiths, Kuss, & Demetrovics, 2014). In view of this, problematic Facebook use has been recently defined as the use of Facebook which creates impairments and problems in users’ life, such as psychological, emotional, social, school, or work difficulties (e.g., Marino, et al., 2016a).

In the literature, different terms coexist (e.g., “problematic Facebook use”, “Facebook addiction”, “Facebook intrusion”) referring to a fundamentally similar concept of Facebook use as a potential behavioral addiction (Blachnio, Przepiorka, & Pantic, 2015). These terms are often used interchangeably, even though they may emphasize specific aspects of problematic Facebook use. For example, “Facebook addiction” is defined either by the six criteria of addiction (i.e., salience, mood modification, tolerance, withdrawal, conflict, and relapse) or by similar factors based on the definition of gambling addiction (e.g. withdrawal, interpersonal problems due to Facebook use, time management and performance problems) (Andreassen, Torsheim, Brunborg, & Pallesen, 2012; Griffiths, 2000). The term “Facebook intrusion” stresses more strongly the aspect of relations with others and the term “problematic Facebook use” centers on the preference for online social interaction (Marino, Vieno, Altoè, & Spada, 2017; Caplan, 2010) as a means of mood regulation.

Due to the lack of a shared definition, for the purpose of the current meta-analysis, problematic Facebook use has been defined as a problematic behaviour characterized by either addictive-like symptoms and/or scarce self-regulation related to Facebook use reflecting in social and personal problems.

Overall, the prevalence of problematic Facebook use appears to range between 2 and 10% among adolescents and young adults[[1]](#footnote-1) worldwide (Alabi, 2013; Chabrol, Laconi, Delfour, & Moreau, 2017; Marcial, 2013; Moreau, Laconi, Delfour, & Chabrol, 2015) showing the need to understand this global phenomenon in more depth (Błachnio et al., 2015). Moreover, in recent years researchers have been showing an increasing interest in the association between problematic Facebook use and psychological distress and well-being (Satici & Uysal, 2015). Whereas some authors considered problematic Facebook use as a potential risk factor for psychological distress and low levels of well-being (Andreassen & Pallesen, 2014; Balci & Gӧlcü, 2013), other researchers have suggested that problematic Facebook use is rather a consequence of other aspects of psychological ill being, such as depression, loneliness, or poor psycho-social health (Balci & Gӧlcü, 2013; Satici, Saricali, Satici, & Çapan, 2014). Irrespective of the directionality of the relationship between problematic Facebook use and psychological distress and well-being, in the current study we wanted to establish whether such relationship exists and how strong it may be. In order to accomplish this objective we conducted a meta-analysis focused on studies on problematic Facebook use and its association with psychological distress and well-being. According to the World Health Organization’s definition of health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (Callahan, 1973, p. 78), we included studies that focused on of both “negative” correlates (psychological distress) and “positive” correlates (well-being).

**1.1. Problematic Facebook Use and Psychological Distress**

Much research on problematic Facebook use has focused on the idea that problematic users are more likely to present symptoms of psychological distress than non-problematic users (Denti et al., 2012; Koc & Gulyagci, 2013; Uysal, Satici, & Akin, 2013). Specifically, several studies (e.g., Chabrol et al., 2017; Moreau et al., 2015) found positive associations between mental health problems, such as anxiety/social anxiety and depressive symptoms, and problematic Facebook use. To explain this relation, authors argued that depressed users tend to problematically use Facebook to regulate their mood online (Hong, Huang, Lin, & Chiu, 2014) and that especially socially anxious users tend to compensate their low self-esteem and poor face-to-face communication skills through maladaptive Facebook use (Bodroža & Jovanović, 2016), thus decreasing their perceived sense of loneliness (Olufadi, 2016). It has been also shown that social media use may provide benefits for socially anxious and shy individuals in terms of perceived social support (Indian & Grieve, 2014). In these cases, what makes Facebook use “problematic” is the fact that users experiencing unwanted feelings or a sense of loneliness usually expect to feel better, albeit in the short-term, when on Facebook, and that they usually do not translate such benefits in increased social skills to be spent in offline relationships with non-Facebook friends (Baker & Oswald, 2010). Moreover, depressive symptoms and suicidal ideation have been found among problematic Facebook users who consider Facebook an easy escape from their real life problems (Walburg, Mialhes, & Moncla, 2016). In line with these findings, Satici and colleagues (2013) showed that people with high levels of psychological vulnerability are more likely to fulfill their everyday social needs, such as acceptance and sense of belonging, by problematically using Facebook (Satici et al., 2014). Overall, problematic Facebook use was found to be associated with a variety of negative outcomes for users’ life. Therefore, the first aim of the current study was to quantitatively summarize the magnitude of the association between problematic Facebook use and psychological distress so far found in the field.

**1.2. Problematic Facebook Use and General Well-Being**

Previous studies have indicated a positive effect of adaptive Facebook use on subjective well-being, for example in terms of increased social capital (Valenzuela, Park, & Kee, 2009) and civic engagement (Lenzi et al., 2015), but recent research has drawn attention also to the potential detrimental effects of problematic Facebook use on different indicators of well-being, such as social and emotional adjustment, and quality of life (Bevan, Gomez, & Sparks, 2014; Kalpidou, Costin, & Morris, 2011; Satici & Uysal, 2015).

Negative associations have been found between life satisfaction (Błachnio, Przepiorka, & Pantic, 2016), subjective vitality, and subjective happiness (Satici & Uysal, 2015) and problematic Facebook use. For example, Kross and colleagues (2013) found that the more participants used Facebook, the more their life satisfaction levels declined. In line with these findings, it has also been argued that problematic behaviours on Facebook co-occur with low levels of satisfaction with social relationships (Elphinston & Noller, 2011) and self-worth (Rae & Lonborg, 2015). Overall, literature indicates that problematic use of SNSs like Facebook may be associated with a lower general well-being (Kuss & Griffiths, 2011). Therefore, the second aim of the current meta-analysis was to investigate the relation between problematic Facebook use and well-being as suggested by studies in the field so far.

**1.3. The Present Study**

Given the rising attention devoted to the topic of problematic Facebook use in the psychological literature, especially in view of its relations with individual (mal)adjustment and well-being, it is important to systematically examine the magnitude of effects that have been found thus far in this field to draw informed conclusions as to whether problematic Facebook use is worthy of continued investigation. To this respect, the use of meta-analysis has distinct advantages over primary studies in providing greater statistical power because it aggregates data across samples from all studies. For these reasons, a meta-analytic review of the existing correlational research on the relations of problematic Facebook use with individuals’ psychological adjustment is warranted. In this article, therefore, we meta-analytically summarized the relations between problematic Facebook use and (i) psychological distress, and (ii) general well-being, with the main aim of estimating the strength of such associations in the normal population. In doing so, we looked at the actual measurement items and construct definitions to determine a construct’s name, rather than blindly relying on an article’s choice of terms. For example, “problematic Facebook use,” “Facebook abuse,” and “Facebook addiction” were treated as the same; similarly, various types of problems, such as “psychological vulnerability,” “poor mental health” and “psychological symptoms” were all categorized as “psychological distress”. Specifically, we hypothesized a positive association between problematic Facebook use and psychological distress (e.g., depression, anxiety, etc.) and a negative association between problematic Facebook use and well-being (e.g., happiness, satisfaction with life, etc.).

As a secondary goal, we explored the potential moderators of effect sizes to explain between-study variability of these effects. Sample characteristics, including mean age of participants, proportion of females, and geographic location of the sample were considered as potential moderators. First, similar to what has been found for other negative experiences online (Fisher, Gardella, & Teurbe-Tolon, 2016; Kowalski, Giumetti, Schroeder, & Lattanner, 2014), the associations between problematic Facebook use and both psychological distress and well-being (with opposite signs) were hypothesized to be larger in older samples. Compared to adolescents, indeed, young adults appear more likely to have longer experiences with this type of social network misuse and, therefore, may report more psychological problems related to such use. However, the opposite could also be true, that is, levels of psychological distress associated with problematic Facebook use may decrease as age increases because users may be better able to cope with their problematic life online. Given that research on problematic Facebook use has never explicitly analyzed developmental changes in how this social network is used and how its problematic use may be differently associated with individual well-being, this hypothesis should be considered tentative. Second, the same associations could be stronger in samples with more females, who generally tend to be more sensitive than males to the adverse effects of stressful life experiences (e.g., Rose & Rudolph, 2006; Rudolph, 2002) and who have been hypothesized to be more susceptible than males to the damaging consequences of negative experiences that occur online (e.g., Kowalski et al., 2014). Third, testing for the potential effect of geographic location of the sample allowed us to explore whether the current findings can be generalized across countries and, in particular, whether the negative correlates of problematic Facebook use differ between Western and Asian countries, as Asian users have been found to be more addicted to the Internet in general than Western users (Kuss, Griffiths, Karila, & Billieux, 2014).

Finally, publication bias is a potential threat to any meta-analytic review. To reduce this, efforts were made to include as many unpublished studies as possible. Moreover, a series of tests on publication bias were performed to verify any threat that could exist in our sample of data (see Method section). In addition, to check whether a significant difference existed between published and unpublished studies in the reported effect sizes, when possible, we also tested for the moderating effect of publication status.

**2. Method**

**2.1. Literature Search**

Multiple methods were used to identify potentially eligible studies. First, computer literature searches were conducted in September 2016 using PsychInfo, Pubmed, Scopus, ResearchGate, and Google Scholar with the following terms: “problematic Facebook use,” “PFU,” “Facebook addiction,” “Facebook abuse,” “excessive Facebook use,” “misuse of Facebook,” “Facebook intrusion,” “Facebook overuse,” “compulsive Facebook use,” “compulsive use of Facebook.” Second, recent review articles on Facebook (Andreassen, 2015; Ryan, Chester, Reece, & Xenos, 2014) were reviewed for relevant citations. Third, the reference sections of the collected articles were searched for relevant earlier references and the “cited by” function in Google Scholar was used to find potentially relevant papers that cited the article by Andreassen and colleagues (2012), which presents the validation of the most widely used scale in this field, namely the Bergen Facebook Addiction Scale. To maximize the possibility of finding unpublished studies, authors of the retrieved articles were also asked for additional studies or unpublished datasets (we obtained four positive replies with this information). Moreover, we inspected the conference programs of the previous three editions of the International Conference on Behavioral Addiction (held in 2014, 2015, and 2016). Doctoral theses were also searched via Dissertation Abstracts International, Pro-Quest Dissertations and Theses Open, Open Access Theses and Dissertations, and Google. Finally, we manually searched relevant journals for recently added content, including Computers in Human Behavior, Cyberpsychology, Behavior and Social Networking, and Addictive Behaviors. The literature search, data analysis, and reporting of this study adhered to MOOSE guidelines for meta-analyses of observational studies (Stroup et al., 2000).

**2.2. Inclusion Criteria**

The most basic requirement for inclusion in the present meta-analysis was consideration of measures of problematic Facebook use and any measure of psychological distress or well-being. Studies including any population were eligible, that is no age-restriction was applied. Studies were excluded if they measured problematic Internet use in general, instead of specifically measuring problematic Facebook use, or if they included measures of simple Facebook use (e.g., frequency of Facebook use) but not of problematic Facebook use. Second, eligible studies were required to have enough quantitative information to calculate effect sizes. Therefore, qualitative studies based on focus groups or open-ended questions were excluded. We also contacted the corresponding authors of studies for which the full-text was not available and asked for it, but did not receive a positive reply. Not only reports written in English were eligible for inclusion; also manuscripts written in other languages were included in the final sample of studies (i.e., French). Finally, both published reports (i.e., journal articles) and unpublished studies (e.g., conference papers, doctoral theses, unpublished datasets) were eligible. Using these inclusion criteria, the current meta-analysis included data from 23 independent samples (see Table 1).

All studies were coded independently by the first and the second author, recording authors and year of publication, publication status, the type of problematic Facebook use measure, sample size, national setting, and demographic characteristics of samples (mean age, proportion of females). In the few cases when there was disagreement among the coders, discrepancies were discussed until agreement was met.

**2.3. Statistical Analysis**

**Effect Size Calculations.** The association between problematic Facebook use and indexes of psychological distress or well-being was coded as a Pearson’s correlation coefficient (*r*). When an article had the measures of interest but did not report enough information to compute effect sizes, we contacted the corresponding authors to ask for an ad hoc analysis (if no response was received, a second e-mail was sent two weeks after the first one; we received the requested data for 16 out of 35 requests). To assure independency of the data, only one effect size per study for each construct that was evaluated in the primary research was used in each analysis. For example, if a study reported correlations for more than one psychological problem (e.g., anxiety and depression) for the same participants, data were averaged within the study before including them in our analysis (Card, 2012). Furthermore, in order to obtain more accurate effect sizes between the constructs of interest, we also corrected correlations for unreliability of measures, a study artifact that attenuates effect size (see Hunter & Schmidt, 2004). Artifactual correction was estimated from reliabilities (Cronbach’s alpha) of the two variables composing each correlation (Card, 2012, pp. 130-133). In the Results section we report both uncorrected and corrected estimated effect sizes (subsequent moderator analyses were performed on the corrected estimates).

**Combining and Comparing Effects Across Studies.** Data analyses were performed with the statistical software R (R Core Team, 2013) using the metafor R package (Viechtbauer, 2010). Prior to combining effect sizes, data from each study were weighted by the inverse of their variance, a function of the study sample size, and then combined using a random effects model, which assumes a distribution of effect sizes as compared to the fixed effect model that assumes a single population effect size (Card, 2012; Field & Gillett, 2010; Hedges & Vevea, 1998). Because the use of correlation coefficients can result in problematic error formulation, the correlation coefficient for each study was converted to the Fisher’s *z* scale and all analyses were performed using the transformed values (Lipsey & Wilson, 2001; Rosenthal, 1991). Then, the resulting summary effect was converted back to correlation for ease of interpretation. Moreover, a 95% confidence interval (CI) was computed around each mean effect size. Confidence intervals not including zero were interpreted as indicating a statistically detectable result supporting associations between problematic Facebook use and psychological distress or well-being. In addition to estimating an overall association between problematic Facebook use and psychological distress, we also ran separate meta-analyses on specific problems when the number of independent samples for which the information was available was 5 or higher. These included depression and anxiety. Similarly, after estimating the association between problematic Facebook use and general well-being, a separate meta-analysis on life satisfaction was performed.

Heterogeneity was assessed using the *Q* statistic (which is distributed as χ2 with *df* = *k*-1, where *k* represents the number of effect sizes; Lipsey & Wilson, 2001), evaluating whether the pooled studies representeda homogeneous distribution of effect sizes. Significant heterogeneityindicates that variations in effect sizes are likely due to sources other than sampling error. Also reported is the *I2* statistic (Higgins, Thompson, Deeks, & Altman, 2003), indicating the proportion of observed variance that reflects real between-study differences in effect size. Moderator analyses (mixed-effects metaregressions) were conducted to examine this variability. Due to concerns about statistical power, we assessed the effects of moderators one at a time, and models with fewer than 10 effect sizes were not examined.

**Publication Bias**. Finally, we also evaluated the potential “publication bias” in different ways. The association between the effect sizes and the variances of these effects was analyzed by rank correlation with use of the Kendall’s *tau* method: lack of significant correlation can be interpreted as absence of publication bias (Begg & Mazumdar, 1994). However, the rank correlation test may only have moderate power for small meta-analyses (Begg & Mazumdar, 1994; Sterne, Gavaghan, & Egger, 2000). An alternative test that is better suited to smaller meta-analyses is Egger’s regression test (Egger, Davey Smith, Schneider, & Minder, 1997), which tests for the symmetry of the funnel plot, with significant asymmetry indicating possible publication bias. Finally, the trim-and-fill method (Duval & Tweedie, 2000) tests whether any study need to be imputed in an asymmetric funnel plot and how this imputation changes the effect size estimate. This collection of multiple approaches represents a thorough examination of potential publication bias: both the Kendall’s tau and Egger’s regression quantify whether publication bias is present. The trim-and-fill method suggests corrections to effect sizes based on any evidence of publication bias.

**3. Results**

**3.1. Results of the Literature Search**

A flowchart that visually depicts the search process is provided in Figure 1. Once duplicates were removed, the search produced 118 records. A screening of titles and abstracts identified 63 studies potentially eligible for inclusion (for 10 of them we were not able to obtain full-texts). However, for 19 of them the information required for the computation of effect sizes was not available and 15 of them did not meet inclusion criteria. The 23 independent samples analyzed in this meta-analytic review included 13,929 participants (60.7% females). The mean age of the participants across the collection of studies was 21.93 years (*SD* = 3.97), with sample means ranging from 16.5 to 32.4 years. Participants were from several different countries across the world: Only two samples were from Asian countries, 20 from 8 different Western countries, and 1 from Africa. All studies used self-report scales to measure both problematic Facebook use and individual characteristics. The most frequently used measure of problematic Facebook use was the Bergen Facebook Addiction Scale (Andreassen et al., 2012; *k* = 7). The remaining studies used a variety of other measures, such as the Internet Addiction Test (Young, 1998) adapted to fit the context of Facebook, an adaptation of Caplan’s Generalized Problematic Internet Use Scale 2 (Caplan, 2010), and the Facebook Intrusion Questionnaire (Elphinston & Noller, 2011). Overall, measures of problematic Facebook use had very good reliability: mean alpha = .89; range: .78 - .93. Out of the 23 samples, 14 included data about the association between problematic Facebook use and psychological distress (e.g., anxiety, depression, loneliness, suicidal ideation, etc.), and 12 had data about the association between problematic Facebook use and well-being (e.g., life satisfaction, subjective happiness, etc.). A summary of information about each study is presented in Table 1.

**3.2. Associations between Problematic Facebook Use and Psychological Distress**

Meta-analytic results of the random-effects model for the association between problematic Facebook use and psychological distress was *r* = .34 (uncorrected *r* = .29), 95% CI [.28, .39], *k* = 14, *Z* = 11.45, *p* < .001. The rank correlation Kendall *tau* = -.27, *p* = .19, indicated absence of a significant correlation between effect size and standard error. This was confirmed by the Egger’s test, which yielded a statistically non-significant *p*-value of 0.83. Finally, the trim-and-fill method indicated that no additional studies needed to be imputed. Therefore, publication bias was not a likely threat to this result.

Heterogeneity of effects across studies (*Q*(13) = 102.54, *p*<.001, *I2* = 87.19%) was explored through moderator analysis. Results of meta-regression showed that the correlation was larger in samples with higher mean age (*β* = .013, *p* = .03). Moreover, this effect tended to be larger in samples from Western countries than in samples from Asian countries (*β* = .20, *p* = .007). However, only two samples from Asian countries were available for this analysis. Proportion of females in the sample and publication status did not significantly moderate this effect.

Two subsequent analyses were performed on depression and anxiety, separately. Mean corrected correlation between problematic Facebook use and depression was *r* = .35 (uncorrected *r* = .30), 95% CI [.30, .41], *k*=8, *Z* = 11.69, *p* < .001. The result for anxiety was *r* = .33 (uncorrected *r* = .29), 95% CI [.29, .37], *k*=8, *Z* = 15.18, *p* < .001. In both cases, the results of rank correlation and Egger’s regression indicated that publication bias was not a likely threat. Also the trim-and-fill method did not suggest imputation of additional studies.

**3.3. Associations between Problematic Facebook Use and Well-Being**

The analysis performed on the association between problematic Facebook use and indexes of well-being yielded a negative mean effect of *r* = -.22 (uncorrected *r* = -.19), 95% CI [-.28, -.15], *k* = 12, *Z* = -6.46, *p* < .001. The rank correlation (tau = -.27, *p* = .25) and Egger’s regression model (*p* = .33) indicated absence of publication bias. The trim-and-fill method also indicated that no additional studies needed to be imputed. Significant heterogeneity emerged (*Q*(11) = 64.75, *p*<.001, *I2* = 88.77%). However, neither mean age, nor percentage of females in the sample, were significant moderators. We were not able to test the effect of national setting because all available studies included samples from Western countries. Publication status was also not significant, thus confirming the results on publication bias.

Finally, the analysis on life satisfaction alone showed a negative effect of *r* = -.19 (uncorrected *r* = -.16), 95% CI [-.29, -.08], *k* = 6, *Z* = 3.51, *p* < .001. The rank correlation and Egger’s regression yielded non-significant results, indicating that publication bias was not a likely threat. The trim-and-fill method suggested imputation of two additional studies on the right side of the funnel plot and the resulting corrected effect was *r* = -.13, 95% CI [-.24, -.02].

**3.4. Sensitivity Analysis**

Finally, consistent with the MOOSE guidelines (Stroup et al., 2000), a sensitivity analysis was performed based on study quality. Three criteria were used to define methodological quality, based on literature suggestions (Downes, Brennan, Williams, & Dean, 2016) and the information available in the study reports: (i) the use of a previously published validated scale of problematic Facebook use, (ii) report of any information about scales’ scores reliability (e.g., Cronbach’s alpha or test-retest) in the study sample, and (iii) report of any information about the factorial validity of the scale of problematic Facebook use in the study sample. Overall, 15 studies satisfied two out of the three criteria and were categorized as being of higher quality within the sample of studies included in this meta-analysis. We then performed separate analyses of this subgroup of studies. For psychological distress, the resulting *r* and confidence interval was *r* = .33 (uncorrected *r* = .29), 95% CI [.25, .41], *k*=9, *Z* = 7.33, *p* < .001. For well-being, results were the following: *r* = -.22 (uncorrected *r* = -.19), 95% CI [-.32, -.11], *k*=7, *Z* = -3.77, *p* < .001.

**4. Discussion**

In this paper we reported results of the first meta-analysis that summarizes current research on the link between problematic Facebook use and both psychological distress and well-being in adolescence and early adulthood. The main findings showed that problematic Facebook use is positively correlated with signs of psychological distress, including anxiety and depression. Conversely, a comparatively smaller negative correlation between problematic Facebook use and well-being (including life satisfaction and other indices of subjective well-being) emerged. Importantly, results from sensitivity analysis and analyses on publication bias showed that these results were quite robust.

Beyond statistical significance, of interest in meta-analysis is the interpretation of effect sizes to determine whether their magnitude represents something psychologically important. The effect sizes yielded by the present meta-analysis can be considered small-to-medium according to Cohen’s criteria, and medium-to-large according to Hemphill’s criteria[[2]](#footnote-2). These “standard” benchmarks, however, have been criticized because they are purely conventional, and somewhat arbitrary, whereas practical and clinical importance depends on the situation researchers are dealing with (e.g., Kline, 2004; Thompson, 2002).

A complementary approach is to put one effect into a meaningful context, comparing it to other effects that have been reported within the same literature and are commonly considered important (for the same approach in meta-analysis see, for example, Gini, Pozzoli, & Hymel, 2014). To our knowledge there are no other published meta-analyses on the negative correlates of problematic Facebook use; however we can use systematic reviews and meta-analyses about close topics as literature of reference. A comparison of our findings with available meta-analyses indicates that the link between problematic Facebook use and psychological distress which has been found in the current meta-analysis is comparable to the association between problematic smartphone use and internalizing problems (Elhai, Dvorak, Levine, & Hall, 2017), and to the associations between Internet addiction and anxiety, depression, and alcohol abuse (Ho et al., 2014). Moreover, the effects observed in our study appear stronger than other effects reported in the published literature, such as the correlation between problematic Internet use and social anxiety (Prizant-Passal, Shechner, & Aderka, 2016), general Internet use and well-being (Çikrıkci, 2016; Huang, 2010), total time spent online and social anxiety (Prizant-Passa et al., 2016). In sum, the present meta-analytic review evidenced links between problematic Facebook use and psychological distress and well-being that are both statistically significant and practically meaningful. Indeed, it could be argued that the addictive-like symptoms presented by problematic users could be strictly linked to the perceived psychological distress and also have a negative impact on general well-being. For example, the mood modification and compulsive symptoms might exacerbate the negative mechanisms involved in anxiety and depression (Caplan, 2010). Similarly, it is plausible to assume that people high in specific features of problematic Facebook use, like preference for online social interactions, might report lower levels of general well-being and happiness because of the lack of social support or self-efficacy (Baturay & Toker, 2016).

As expected, significant heterogeneity across effect sizes was also observed, and some significant a priori moderators were tested. Although the limited number of studies in some moderator categories tempers this contribution, the results are nevertheless suggestive and worthy of consideration in future research. Regarding psychological distress, results of the meta-regression showed that its association with problematic Facebook use was larger in older samples (that is, samples with higher mean age). This finding is consistent with another recent meta-analysis (Prizant-Passal et al., 2016) where problematic Internet use was more strongly associated with social anxiety as participants’ age increased. These findings may support the application of the general chronic-stress model to Facebook use research. Briefly, this model posits that more longstanding negative experiences are associated with more adverse psychological symptoms (Dohrenwend & Dohrenwend, 1981). As far as Facebook use is concerned, it is plausible that young adults have a longer cumulative exposure to electronic media and their risks, including problematic Facebook use, which might account for this association increasing with age. The chronic-stress model applied to this topic would predict that people who have experienced problematic Facebook use for longer time would have worse outcomes than those who have experienced more limited maladaptive use. Further, this explanation is consistent with the possibility that symptoms of maladjustment, such as higher psychological distress, might be reported only after problematic use has persisted for some time (for similar reasoning in the context of prolonged negative experiences see, for example, Rueger, Malecki, & Demaray, 2011). Unfortunately, further understanding of this finding is limited by the lack of additional information about the developmental trajectories that may describe the progress of the link between problematic Facebook use and psychological distress over time; moreover studies failed to report important information about when participants created their Facebook profile or when they started using Facebook in a problematic way, which may be useful to support our interpretation. An alternative explanation of this age-related difference could be based on the different meaning the use of Facebook, perhaps even more than other Internet applications, has for adolescents compared to young adults in everyday life. For adolescents, spending the majority of their free time on social networks may be regarded as “normative” (see, Marino, Vieno, Pastore, Albery, & Spada, 2016b) and therefore adaptive, and it may thus be less related to psychological distress than for adults. These possibilities are speculative, however, and would need to be further investigated in future longitudinal studies.

Moreover, meta-regression showed that this effect tended to be larger in samples from Western countries than in samples from Asian countries. However, this finding should be taken with great caution because we were able to compare only two samples from Asian countries with more samples from Western countries. It would be interesting for future cross-cultural studies to explore the possibility that the negative psychological correlates of problematic Facebook use are somewhat different in different cultural contexts. Results of such studies would deepen our understanding of the phenomenon, but would also better inform prevention and education strategies aimed at different cultural groups.

Regarding the association between problematic Facebook use and well-being, none of the moderators significantly explained between-study variability of effect sizes. First, in our review it was apparent that almost all available studies analyzed either psychological distress or well-being. Future studies that concurrently analyze both signs of psychological distress and of well-being and satisfaction in people who use Facebook problematically are warranted. Moreover, such studies should analyze the role of individual and contextual characteristics that may moderate these links.

**4.1. Limitations and Future Directions**

Although this meta-analysis makes important contributions to understanding the relations between problematic Facebook use and individual (mal)adjustment and well-being, there are limitations that need to be kept in mind. First, this meta-analysis relied exclusively on concurrent associations. Even though this reliance was imposed by the extant studies, this limitation necessitates caution in interpreting the findings. Although problematic Facebook use is likely to influence psychological well-being of social networking sites users over time, it may also be the case that feelings of depression and anxiety, among others, also lead some people to problematic use of Facebook (Blachnio et al., 2015). Unfortunately, as already noted, this domain of research is still dominated by cross-sectional studies that hamper the possibility to establish the direction of the association between problematic Facebook use and psychological distress and well-being. An important question for future longitudinal research is whether problematic Facebook use serves primarily as an antecedent and/or consequence of psychological distress and other adjustment indices and whether these temporal relations are similar or different across age groups (e.g., adolescents vs. young adults). Particularly useful for this kind of test would be long-term cascade models, which are able to test cross-lag paths across multiple time points. Moreover, experimental studies (e.g., randomized controlled intervention studies) designed to investigate whether—and under what circumstances—changing how people use Facebook toward a less problematic use can, in turn, change their psychological adjustment and well-being could help to clarify the issue of directionality.

Second, although we aimed to identify studies conducted throughout the world, the eventual pool of eligible studies contained almost only samples from Western countries. There was very limited representation from other countries of the world where most of the world’s population is located (Asia, Africa, and South America). This restricted sample limits the generalizability of the current findings. A useful direction for the field of problematic Facebook use will be to investigate these relations across a wider range of countries and cultures, which may differ in the availability of technology, especially to adolescents, the amount of adult monitoring of technology use, and so forth.

Moreover, although the positive association between problematic Facebook use and psychological distress is established, in reviewing studies for this meta-analysis the lack of research investigating moderators of this association was readily apparent. Little is known about how problematic Facebook use interacts with other individual risk factors, such as lack of face-to-face interaction skills and lack of social support, that make some people more likely to use Facebook in an unsafe manner or that worsen the negative effects of problematic Facebook use. Overall, the individual and contextual factors that may buffer or exacerbate the relation of problematic Facebook use with psychological problems remains unclear. This further confirms that the research on problematic Facebook use is still in its infancy and future studies about related risks and protective factors would advance this research line and may better inform clinical and prevention work on problematic Facebook use.

Finally, because our aim was to summarize the relations between problematic Facebook use and psychological distress and general well-being, we purposely excluded studies that have analyzed simple Facebook use. However, we recognize that important information could be gathered by the analysis of how Facebook use in general is related to users’ psychological distress or well-being. For example, as briefly noted in the introduction, some studies have evidenced the potentially adaptive use of social media for vulnerable people (e.g., Indian & Grieve, 2014). Future studies in the field of problematic Facebook use could benefit both theoretically and methodologically, from a more thorough understanding of how Facebook, and other social media, are used in general and how they may influence users’ lives in ways that are not necessarily “problematic”.

In conclusion, from a theoretical point of view, results of the current meta-analysis contribute to the debate of whether problematic Internet use can stand on its own diagnosis or whether it is a negative consequence of other existing disorders (Pies, 2009). In other words, the relatively medium correlations found with psychological distress and general well-being seem to indicate that problematic Facebook use might have the potential to be recognized as a standalone disorder in future studies. From a clinical perspective this would imply that psychological evidenced-based interventions (e.g. cognitive-behavioural therapy/motivational interviewing) which have been successfully applied to addictive behaviours generally, and specifically to problematic Internet use, may be of potential benefit in helping individuals overcoming problematic Facebook use (Spada, 2014).

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Table 1. Summary of Studies Included in the Meta-Analysis (APPENDIX A).

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| First author (year)  | Sample size  | % of females | Mean age of sample | National setting | Publication status | Depression | Anxiety | Other psychological problems | Well-being | Life satisfaction |
| Balci (2013) | 903 | 59.4 | 21.1 | Turkey | published | - | - | .35 | - | - |
| Blachnio (2015) | 672 | 65 | 27.53 | Poland | published | .45 | - | - | - | - |
| Blachnio (2016) | 445 | 79.1 | 26.95 | Serbia | published | - | - | - | .03 | .03 |
| Bodroža (2016, sample 1)  | 359 | 79.4 | 21.29 | Serbia | published | - | .29 | - | - | - |
| Bodroža (2016, sample 2) | 381 | 62.8 | 20.73 | Poland | published | - | .24 | - | - | - |
| Delfour (2015) | 456 | 76 | 20.5 | France | published | .32 | .31 | - | - | - |
| Elphinston (2011) | 305 | 63.9 | 19.75 | Australia | published | - | - | - | -.12 | -.12 |
| Hong (2014) | 241 | 41.5 | 20 | Taiwan | published | .23 | - | - | - | - |
| Khumsri (2015) | 872 | 63 | 16.6 | Thailand | published | - | - | .10 | - | - |
| Koc (2013) | 447 | 22 | 21.64 | Turkey | published | .28 | .23 | - | - | - |
| Laconi (2016)^ | 822 | 55.3 | 21.64 | France | unpublished | .26 | .31 | .30 | - | - |
| Lee (2015) | 304 | 56 | 22.45 | United States | published | - | .25 | - | - | - |
| Marino (2016) | 822 | 77.1 | 21.17 | Italy | published | - | - | - | -.22 | - |
| Marino (2016) | 968 | 37.3 | 17.19 | Italy | published | - | - | - | -.19 | - |
| Marino (2016)^ | 637 | 62 | 16.62 | Italy | unpublished | - | - | - | -.22 | -.22 |
| Marino (2015)^ | 455 | 83.5 | 22.38 | Italy | unpublished | - | - | - | -.12 | - |
| Masur (2014) | 581 | 67.1 | 28.84 | Germany | published | - | - | - | -.17 | -.17 |
| Olufadi (2016) | 2049 | 57 | 32.43 | Nigeria | published | .30 | .34 | .18 | -.13 | - |
| Satici (2014) | 248 | 56 | 21.5 | Turkey | published | - | - | .41 | - | - |
| Satici (2015) | 311 | 58 | 20.86 | Turkey | published | - | - | - | -.32 | -.32 |
| Uysal (2013) | 297 | 53 | 20.1 | Turkey | published | - | - | - | -.37 | - |
| Verseillié (2016)^ | 1068 | 62.7 | 26.64 | France | unpublished | .29 | .29 | - | -.17 | -.17 |
| Walburg (2016) | 286 | 59.8 | 16.5 | France | published | .23 | - | .21 | -.28 | - |

^= Unpublished datasets provided by authors without title nor related draft paper. Numbers reported in the last 5 columns refer to correlation coefficients from primary studies.

Table 2. Summary of Meta-Analytic Results of Associations of Problematic Facebook Use with Psychological Distress and General Well-being

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | *k* | *N* | *r* | 95% CI | *r+* | 95% CI | *Z* | *Q*(df=k-1) | *I2* |
| Psychological distress | 14 | 9,172 | .29 | .24, .34 | .34 | .28, .39 | 11.45\*\* | 102.54\*\* | 87.19% |
| Depression | 8 | 6,041 | .30 | .25, .35 | .35 | .30, .40 | 11.69\*\* | 31.52\*\* | 80.58% |
| Anxiety | 8 | 5,950 | .29 | .26, .32 | .33 | .29, .37 | 15.18\*\* | 21.34\* | 62.00% |
| General well-being | 12 | 8,160 | -.19 | -.24, -.13 | -.22 | -.28, -.15 | -6.46\*\* | 64.75\*\* | 88.77% |
| Life satisfaction | 6 | 3,283 | -.16 | -.25, -.07 | -.19 | -.29, -.08 | -3.51\*\* | 34.44\*\* | 89.07% |

Notes: \* *p* < .01, \*\* *p* < .001; *k* = number of samples; *N* = number of participants; *r+* = effect size corrected for unreliability; CI = confidence interval

Figure 1. Flow Diagram of Study Inclusion

Records identified with literature search (n = 485)

Screening

Included

Eligibility

Identification

Records after duplicates removed
(n = 118)

Records screened
(n = 118)

Full-text articles assessed for eligibility
(n = 53)

Articles excluded, not meeting inclusion criteria (no measure for the variables of interest) (n = 15), not including enough data to calculate ES (n =19)

Samples included in meta-analysis
(n = 19 + 4 unpublished datasets received by email)

Records excluded by title/abstract screened (reviews, commentaries, qualitative studies, studies not on topic of interest) (n = 55), full-text not available (n = 10)

**APPENDIX A. Studies included in the meta-analysis**

Andreassen, C. S., Torsheim, T., Brunborg, G. S., & Pallesen, S. (2012). Development of a Facebook addiction scale. *Psychological Reports, 110*, 501-517.

Balci, Ş., & Gölcü, A. (2013). Facebook addiction among university students in Turkey: “Selcuk University example”. Journal of Turkish Studies, 34, 255-278*.*

Blachnio, A., Przepiorka, A., & Pantic, I. (2015). Internet use, Facebook intrusion, and depression: Results of a cross-sectional study. *European Psychiatry, 30*, 681-684.

Błachnio, A., Przepiorka, A., & Pantic, I. (2016). Association between Facebook addiction, self-esteem and life satisfaction: a cross-sectional study. *Computers in Human Behavior, 55*, 701-705.

Bodroža, B., & Jovanović, T. (2016). Validation of the new scale for measuring behaviors of Facebook users: Psycho-Social Aspects of Facebook Use (PSAFU). *Computers in Human Behavior, 54*, 425-435.

Chabrol, H., Laconi, S, Delfour, M, Moreau, A. (2017). Contributions of Psychopathological and Interpersonal Variables to Problematic Facebook Use in Adolescents and Young Adults. *Int J High Risk Behav Addict* (in press).

Delfour, M., Moreau, A., Laconi, S., Goutaudier, N., & Chabrol, H. (2015). Problematic Facebook use in adolescents and young adults. *Neuropsychiatrie de l'Enfance et de l'Adolescence, 63*, 244-249.

Elphinston, R. A., & Noller, P. (2011). Time to face it! Facebook intrusion and the implications for romantic jealousy and relationship satisfaction. *Cyberpsychology, Behavior, and Social Networking, 14*, 631-635.

Hong, F. Y., Huang, D. H., Lin, H. Y., & Chiu, S. L. (2014). Analysis of the psychological traits, Facebook usage, and Facebook addiction model of Taiwanese university students. *Telematics and Informatics, 31*(4), 597-606.

Khumsri, J., Yingyeun, R., Mereerat, M., Hanprathet, N., & Phanasathit, M. (2015). Prevalence of Facebook addiction and related factors among Thai high school students. *Journal of the Medical Association of Thailand, 98*, S51-60.

Koc, M., & Gulyagci, S. (2013). Facebook addiction among Turkish college students: The role of psychological health, demographic, and usage characteristics. *Cyberpsychology, Behavior, and Social Networking, 16*, 279-284.

Marino, C., Vieno, A., Moss, A. C., Caselli, G., Nikčević, A. V., & Spada, M. M. (2016a). Personality, motives and metacognitions as predictors of problematic Facebook Use in university students. *Personality and Individual Differences, 101*, 70-77.

Marino, C., Vieno, A., Pastore, M., Albery, I. P. & Spada, M. M. (2016b). The relative contribution of personality, social identity and social norms to problematic Facebook use in adolescents. *Addictive Behaviors, 63,* 51–56.

Masur, P. K., Reinecke, L., Ziegele, M., & Quiring, O. (2014). The interplay of intrinsic need satisfaction and Facebook specific motives in explaining addictive behavior on Facebook. *Computers in Human Behavior, 39*, 376-386.

Olufadi, Y. (2016). Social networking time use scale (SONTUS): A new instrument for measuring the time spent on the social networking sites. *Telematics and Informatics, 33*, 452-471.

Satici, B., Saricali, M., Satici, S. A., & Çapan, B. E. (2014). Social competence and psychological vulnerability as predictors of Facebook addiction. *Studia Psychologica, 56*, 301.

Satici, S. A., & Uysal, R. (2015). Well-being and problematic Facebook use. *Computers in Human Behavior, 49*, 185-190.

Uysal, R., Satici, S. A. & Akin, A. (2013). Mediating effect of Facebook addiction on the relationship between subjective vitality and subjective happiness. *Psychological Reports, 113*, 948-953.

Walburg, V., Mialhes, A., & Moncla, D. (2016). Does school-related burnout influence problematic Facebook use? *Children and Youth Services Review, 61*, 327–331.

1. Research on problematic Facebook use has never really adopted a developmental approach, which represents an apparent limitation of the current literature. Consequently, studies reviewed here did not explicitly address issues related to potential age-related differences of this phenomenon and of possible differential associations of problematic Facebook use with users’ well-being at different stages of life (i.e., adolescence vs. adulthood). [↑](#footnote-ref-1)
2. Cohen (1992) proposed conventional values as benchmarks for what are considered to be “small”, “medium”, and “large” effects (*r* = .1, .3, and .5, respectively). More recently, based on empirical findings, Hemphill (2003) recommended a reconceptualization of effect sizes in psychological research, in which *r =* .1 is “small”, *r =* .2 is “medium”, and *r =* .3 is “large” (see also Huang, 2011). [↑](#footnote-ref-2)
3. References marked with an asterisk indicate studies included in the meta-analysis. The full list is reported in the Appendix. [↑](#footnote-ref-3)