Through the Looking Glass of Social Media. Focus on Self-Presentation and Association with Mental Health and Quality of Life. A Cross-Sectional Survey-Based Study.

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Abstract

Background

Social media use among adolescents has been linked to mental health and well-being. However, most of the studies investigating this association focus primarily on frequency and duration of use, providing little knowledge of how various types of social media activities may be differentially linked to mental health and well-being. A recent narrative review highlighted that self-presentation may be an important factor to investigate in order to better understand the link between use of social media and well-being among adolescents. The aims of the present study were to investigate the association between focus on self-presentation on social media and mental health and quality of life among adolescents. Specifically, we aimed to investigate the overall and gender-stratified associations between self-presentation and symptoms of depression and anxiety, as well as a general measure of quality of life.

Methods

This study employs a cross-sectional survey-based design. A total of 513 (56%) students enrolled at a senior high school in Norway participated. The mean age of the participants were 17.1 years (1.1 standard deviations), and 58% were boys. Associations between focus on self-presentation on social media and symptoms of anxiety and depression and quality of life were investigated using blobbograms, standardized mean difference and gender-specific linear regression models.

Results

Overall, a high focus on self-presentation on social media was associated with more mental health problems and reduced quality of life. The strength of the associations with symptoms of depression (0.64 standardised mean difference (SMD)) and anxiety (0.60 SMD) was medium to large, while it was medium for quality of life (-0.45 SMD). In gender-stratified analyses, the association was similar for boys and girls in relation to symptoms of anxiety. For symptoms of depression, the association was stronger for girls compared to boys. Focus on self-presentation on social media was only significantly associated with quality of life among girls.

Conclusions

In sum, our findings are preliminary evidence of a medium strong relationship between focus on self-presentation on social media and symptoms of anxiety and depression for both genders, albeit with potential important gender differences. Potential implications and public health relevance of the findings are discussed.

Background

Adolescence is an important period in life characterised by increased independence from parents and an expanded social life dominated by one's peers [1]. It is also a period with increased emotional upheaval

[2], and many mental health problems commonly emerge during adolescence [1]. There is also evidence that suggest quality of life is lower during adolescence compared to earlier childhood years [3].

Today's adolescents grow up in the age of social media use and online communication. Social media can be defined as "highly interactive platforms via which individuals and communities share, co-create, discuss, and modify user-generated content" [4]. Social media use among adolescents has been linked to mental health and well-being [5], as some studies indicate that social media use is associated with more mental health problems and decreased well-being. However, most of the studies investigating this association focus primarily on frequency and duration of use [5–7], providing little knowledge of how various types of social media activities may be differentially linked to mental health and well-being. Although a growing number of studies in general indicate that social media use should be considered multifaceted, and that distinct uses is differentially associated with adverse outcomes [see for instance 8, 9], there is still a dearth of studies taking this into consideration. Thus, there is a call for more novel quantitative studies investigating the relationship between *what* adolescents do on social media and how this is associated with mental health and well-being.

Self-presentation has been highlighted as one important social media activity by many researchers [10–14]. Self-presentation may be defined as individual practices related to how one present oneself to others [15], and is generally thought to be motivated by a wish to make a socially desirable impression to others, while still remaining true to one's own beliefs and ideals.

Self-presentation practices on social media include sharing of self-created content, posting of opinions and promoting online content that one is interested in (like news, music and movies), and adolescents are reported to be more engaged in these activities than any other age-group (see instance Herring and Kapidzic [13]). Social media gives adolescents control over what, where (on which platform), how and when they self-present to others. The immediacy of social feedback (e.g., likes and comments) provides cues about social desirability and direction for adjusting future presentations to be in alignment with how adolescents ideally would like to present themselves. These feedback mechanisms and other features of social media, such as the potential to reach multiple audiences, seems to facilitate self-presentation on social media [16]. Given the focus many social media platforms puts on likes, other 'nano-level interactions' [17], number of followers, and comments, it seems likely that issues related to how one present oneself online is a potent factor in many adolescents' life. This may be further accentuated by engagement in social comparison on social media [18].

A few previous studies have shown that activities of self-presentation on social media are associated with well-being and mental health. Frison and Eggermont found for instance that adolescents that actively self-presented by posting content on social media reported less depressive symptoms compared to those who used social media to more passively observe (i.e. consume) other's content [19]. Similarly, a recent longitudinal study following participants at 10, 12 and 14-years-of age, reported that more passive, "other-oriented" social media use (i.e. merely commenting or "liking" others' posts) versus actively self-presenting on social media had a differential effect on self-esteem related to physical appearance [20].

Specifically, the authors found that increased other-oriented social media use was associated with reduced subsequent appearance self-esteem, but this was not found for actively engaging in self-presenting on social media. They did, however, also report important gender differences. In gender-specific analyses they found that the relationship between earlier other-oriented social media use on later appearance self-esteem was strong among girls but absent among boys [20]. They also reported that girls were consistently more likely to engage in other-oriented social media use across all time points. Several other authors have also reported that there are gender differences in relation to self-presentation on social media [13, 21, 22]. Herring and Kapidzic reported for instance that adolescent girls are more likely to present their friendship ties on social media, while boys post updates more related to technology, sports, and humor [13]. Adolescent boys are also more likely to join or identify with online social groups that differ from their offline social groups [13]. Furthermore, adolescent girls use social media more to communicate with their peers and maintain or reinforce preexisting relationships, while boys on the other hand more actively seek out new people and make new friends online [13].

Previous studies also indicate a relationship between the authenticity of the self-presentation and mental health and well-being [6, 23]. In 2017, Twomey and O'Reilly authored a systematic review of self-presentation on Facebook and mental health and personality [23]. They identified 21 studies of mostly adult and young adult participants, and among other things, found support for associations between false self-presentation and low self-esteem and higher levels of social anxiety, and true self-presentation and increased levels of self-esteem. In relation to primary studies, Jang and colleagues reported that a true self-presentation style led to greater self-reported happiness among high self-esteem users using an experimental approach in an adult sample [24]. Conversely, the use of instrumental or strategic (i.e. only presenting your "best self") self-presentation were associated with more self-reported happiness regardless of self-esteem level [24]. Also among college students, strategic self-presentation has been reported to be associated with increased subjective well-being [25]. Furthermore, Reinecke and colleagues found that authenticity in self-presentation on social media was longitudinally associated with increased positive affect and decreased negative affect among adults [26]. In one of the few studies of adolescent participants, Xie and colleagues reported that online authentic self-presentation was associated with lower levels of depression symptoms as part of a mediation model [27]. On the other hand, false self-presentation behaviors is reported to be associated with negative mental health among adults, as indicated by higher symptom levels of depression, anxiety and stress [28].

Although there are some studies investigating the potential consequences of different aspects of self-presentation on social media, most previous studies have focused on the antecedents or motivations for self-presentation [24]. Most of the studies we were able to identify, however, with the exception of Xie and colleagues [27], included young adult or adult samples. This is also reflected by the included primary studies in Twomey and O'Reilly's systematic review [23]. Furthermore, a recent narrative review highlighted that self-presentation may be an important factor to investigate in order to better understand the link between use of social media and well-being among adolescents [6]. Based on these considerations, there is a need for further studies investigating aspects of self-presentation on social media and associations with mental health and well-being among adolescents. Based on previous

studies indicating the relevance of personal investment and emotional involvement in relation to social media use and mental health [29], one important aspect could be the focus (i.e. focus in terms of the attention and importance the adolescents give to their self-presentation activities) adolescents put on self-presentation on social media. We are not aware of any previous studies that have investigated the association between focus on self-presentation on social media and mental health and well-being.

The aims of the present study were to investigate the association between focus on self-presentation on social media and mental health and quality of life among adolescents. Specifically, we aimed to investigate the overall and gender-stratified associations between self-presentation and symptoms of depression and anxiety, as well as a general measure of quality of life.

Methods

Study design, setting and participants

The present study employs cross-sectional data from an online survey of adolescents recruited from a senior high school in Vestland County, Norway. All students aged 16 or more enrolled at the high school were invited to the survey, and N = 513 (56%) participated. The data were collected in March 2020. The students were first informed about the study from their teacher one day prior to participation, and the next day they received a survey-specific web address (uniform resource locator; URL) containing written online information about the study as well as the possibility to consent to participate. One school hour was allotted to completing the questionnaire. Four participants did not complete the survey and were therefore excluded from the present study. The mean age of the participants was 17.1 years (1.1 standard deviations), and 58% were boys.

Variables

Age and gender were reported by the participants.

Independent variables: Focus on self-presentation on social media

Participant's focus on self-presentation on social media was measured by five questions:

1. I use a lot of time and energy on content I post on social media
2. It is important for me that my posts receive many likes and/or comments
3. It is important for me to have many followers on social media
4. I delete posts on social media that do not receive enough likes and/or comments
5. I retouch pictures of myself to look better before I post them on social media

The response categories were "not at all", "very little", "sometimes/partly true", "a lot" and "very much", coded 1 to 5. The questions are used separately and as a summed mean score (Cronbach's alpha of

0.86) in the present study.

Dependent variables: Measures of mental health and quality of life

Symptoms of anxiety

Anxiety was measured by the questionnaire General Anxiety Disorder 7 (GAD-7; Spitzer, Kroenke [30]). GAD-7 consists of 7 questions regarding symptoms of general anxiety scored from 1 (not at all) to 4 (almost every day). The questionnaire can be used as a continuous measure (total score, ranging from 0–21 in this study (28 maximum)) or as a dichotomous variable with a cut-off of 10. Cronbach's alpha was 0.89 in the present sample.

Symptoms of depression

Depression was measured by the questionnaire Short Mood and Feelings Questionnaire (SMFQ; Turner, Joinson [31]). SMFQ consists of 13 statements related to symptoms of depression with the following response options 0 (not true), 1 (sometimes true), and 2 (correct). The questionnaire can be used as a continuous measure (total score, ranging from 0–26) or as a dichotomous variable with a cut-off at the 90th percentile. Cronbach's alpha was 0.91 in the present sample.

Quality of Life

Quality of Life (QoL) was measured using the Warwick-Edinburgh Well-being Scale (WEMWBS; Tennant, Hiller [32]). WEMWBS consists of 14 statements related to well-being and quality of life scored from 1 (not at all) to 5 (all the time). WEMWBS can be used as a continuous measure (total score, ranging from 5–70), and as a dichotomous measure with median split as the cut-off point. Cronbach's alpha was 0.92 in the present sample.

Statistical analyses

Descriptive gender-specific statistics of the independent and dependent variables are presented in Table 1. In Fig. 1, the associations between each self-presentation item and symptoms of anxiety and depression and quality of life are presented as blobbograms [33]. For Fig. 1 the mean of each self-presentation item for those below and above the cut-offs for anxiety, depression and quality of life was calculated, as well as the standardised mean difference. The overall standardised mean difference for self-representation as a summed mean score is also presented for each dependent variable. In Fig. 2, the predicted mean gender-standardized score for each dependent variable is presented across levels of the summed mean score of self-presentation for boys and girls separately. Linear gender-specific regressions were calculated to obtain the coefficient for the association between the mean summed score of self-presentation and the dependent variables. The mean gender-standardized score for symptoms of anxiety and depression, and QoL was obtained by a gender-stratified Z-scoring of the summed variables (total score). Thus, each gender-specific bar represents deviance in standard deviations from overall gender-

specific mean across focus on self-presentation, and the error bars denotes 95% confidence intervals. The variables included in the present study had some missing values, ranging from n = 3 to n = 30. To retain the maximum level of information in the analyses employed in Figs. 1 and 2, we employed pairwise deletion to handle missingness. The statistical analyses were performed using Stata 15 [34], R [35] and RStudio [36] including the R-packages "gtsummary" [37] and "meta" [38].

Table 1
Description of included study variables across gender. N = 509.

Variables	Boys, N = 296[1]	Girls, N = 213[1]	p-value[2]
Time and energy			< 0.001
Not at all	146 (53%)	57 (28%)	
Not much	71 (26%)	51 (25%)	
Some	37 (13%)	55 (27%)	
A lot	16 (5.8%)	29 (14%)	
Very much	6 (2.2%)	11 (5.4%)	
Missing	20	10	
Likes important			< 0.001
Not at all	161 (57%)	63 (31%)	
Not much	61 (22%)	55 (27%)	
Some	40 (14%)	42 (21%)	
A lot	12 (4.3%)	32 (16%)	
Very much	6 (2.1%)	12 (5.9%)	
Missing	16	9	
Followers important			< 0.001
Not at all	162 (58%)	62 (30%)	
Not much	69 (25%)	65 (32%)	
Some	35 (12%)	40 (20%)	
A lot	9 (3.2%)	29 (14%)	
Very much	5 (1.8%)	8 (3.9%)	
Missing	16	9	
Deleting posts			0.005
Not at all	209 (75%)	119 (59%)	
Not much	39 (14%)	40 (20%)	
Some	20 (7.1%)	23 (11%)	
A lot/Very much[a]	12 (4.3%)	20 (9.9%)	

Variables	Boys, N = 296[1]	Girls, N = 213[1]	p-value[2]
Missing	16	11	
Retouching			0.4
Not at all	220 (79%)	149 (74%)	
Not much	37 (13%)	27 (13%)	
Some	15 (5.4%)	18 (8.9%)	
A lot/Very much[a]	7 (2.6%)	8 (4.0%)	
SMFQ, 90th percentile			< 0.001
Below	279 (94%)	181 (85%)	
Above	17 (5.7%)	32 (15%)	
GAD-7, score 10+			< 0.001
Below	258 (87%)	156 (73%)	
Above	38 (13%)	57 (27%)	
WEMWBS, median split			< 0.001
Below	130 (44%)	135 (64%)	
Above	165 (56%)	76 (36%)	
Missing	1	2	
Self-presentation, summed mean score	4.4 (4.2)	7.1 (4.9)	< 0.001
Missing	15	9	
[1]Statistics presented: n (%); mean (SD)			
[2]Statistical tests performed: chi-square test of independence; Fisher's exact test; Wilcoxon rank-sum test			
[a]Response categories "a lot" and "very much" collapsed to avoid cells < 5			

Results

Overall, girls indicated more focus on self-presentation on social media except for retouching of pictures of themselves (p = 0.448 for gender difference, see Table 1). For boys, the proportion for at least some focus on self-presentation ranged from 8% ("retouching") to 20% ("time and energy"), and the corresponding range for girls were 13% ("retouching") and 46% ("time and energy"). Girls were also more likely to be above the cut-off for anxiety and depression, while being below the cut-off for QoL. In relation

to the association between self-presentation and anxiety, case-level anxiety was associated with higher mean levels across each self-presentation item (Fig. 1). The overall standardised mean difference was 0.60 (CI95% 0.37, 0.84). For depression, case-level depression was associated with higher mean levels for all but one item (retouching of pictures) of self-presentation. The overall standardised mean difference was 0.64 (CI95% 0.33, 0.95). For quality of life, high QoL (above median) was associated with lower mean levels for all items of self-presentation (overall standardised mean difference − 0.45 (CI95% -0.63, -0.27)). For both girls and boys there was a significant positive association between focus on self-presentation on SOME and symptoms of anxiety and depression (Fig. 2). Having a high focus on self-presentation on SOME ("very much") was associated with the highest predicted anxiety-symptom levels (1.0 SD and 0.8 SD for boys and girls, respectively) compared to the gender-specific mean. The same patterns were found for depression symptom-levels (0.8 SD and 1.2 SD for boys and girls, respectively). For quality of life, increased focus on self-presentation on social media was associated with decreased levels for girls (-1.0 SD for those with a high focus). For boys, no statistical association between focus on self-presentation and quality of life was identified.

Discussion

The present study investigated the association between focus on self-presentation on social media and mental health and quality of life among adolescents. Overall, a high focus on self-presentation was associated with more mental health problems and reduced quality of life. The strength of the associations with symptoms of depression and anxiety was medium to large, while it was medium for quality of life according to suggested guidelines on magnitude of effect [39]. In the gender-stratified analyses, the association was similar for boys and girls in relation to symptoms of anxiety. For symptoms of depression, the association was stronger for girls compared to boys. With regards to quality of life, focus on self-presentation on social media was only significantly associated for girls. In sum, our findings are preliminary evidence of a medium strong relationship between focus on self-presentation on social media and symptoms of anxiety and depression for both genders, albeit with potential important gender differences. This is in accord with recently reported associations between types of social media use and mental health indicators among adolescents and young adults [20, 40]. Although we report an association between focus on self-presentation on social media and poor mental health and lower quality of life, we cannot assert the direction of the association. So, while it may be that increased focus on self-presentation is related to poorer mental health, it may also be true that pre-existing mental health problems lead to an increased focus on self-presentation. It is also just as likely that both relationships co-exist, so that both factors form part of a self-reinforcing cycle, which lead to both increased focus on self-presentation and poorer mental health.

Importantly, the present study investigated to what degree self-reported attention to self-presentation on social media and the importance of feedback was associated with mental health, rather than just how much time the participants spent engaged in self-presentation behavior. Our results do not necessarily indicate that engaging in self-presentation behavior per se is associated with poor mental health and well-being, but rather that the focus on these aspects of social media are important factors to gauge.

Although the frequency and duration of self-presentation behaviors is likely to be closely related to the time spent engaging in these behaviors, it is also possible that adolescents may engage in self-presentation behavior without caring much about the feedback they receive. In fact, Frison and Eggermont [19] found that adolescents that actively presented themselves on social media reported less depressive symptoms than those who did not. Thus, self-presentation on social media in itself may not be harmful, but preoccupation with presenting oneself in a manner that elicit a wanted feedback from others may be detrimental to mental health. Differential associations with mental health and well-being is also likely to be related to true versus strategic self-presentation practices as reported by Jang and colleagues [24].This notion is further echoed by a qualitative study of adolescent girls which reported on the importance put on self-presentation on social media in relation to self-esteem and insecurity by the participants [41]. The participants reported, for instance, that they would delete posted photographs with few likes out of frustration or embarrassment.

Only one of the items used in the present study explicitly asked about appearance-related self-presentation (retouching selfies to look better), while the other items asked about content in general. One underlying mechanism for the negative association between self-presentation and mental health found in this study may be related to appearance-related self-presentation. In line with this, a recent study found that social media engagement and behaviors involving appearance comparisons and judgements thereof is of particular importance for symptoms of depression and anxiety among adolescents and young adults [40]. This may be due to the immediacy of comparison facilitated by pictures as compared to other media [42], as well as the importance put on – females' in particular - appearance and attractiveness emphasized in most cultures [43]. Furthermore, posting pictures of themselves may leave them more vulnerable to negative feedback or lack of feedback.

Self-presentation on social media was recently highlighted as a potentially important part of the puzzle to increase our understanding of the relationship between social media use and mental health and well-being among adolescents [6]. In our sample, a relatively large proportion reported at least some focus on self-presentation on social media, but for four out five indicators (except "retouching"), the girls reported more focus on these aspects compared to boys. This is in line with other findings, where adolescent and young adult women report higher preoccupation with self-presentation on social media compared to boys [40], but are somewhat at odds with findings from younger age groups, where boys and girls displayed similar levels of self-oriented social media activity [20]. A study investigating selfie-taking and posting patterns found, however, consistent gender differences across broad age groups (aged 12 to 50 years). In that study, adolescents (aged 12 to 19 years) were found to be more likely than older aged groups to take own- and group-selfies, post their own selfies, and use filters. Furthermore, females were in general more likely to take personal and group selfies, post personal selfies, crop photos and use filters compared to males, a gender-difference that was more pronounced during in the adolescent group [44]. Based on these findings, it may be that one of the underlying mechanisms for our observed gender differences the relationship between self-presentation and mental health are due to differences in the selfie-culture between boys and girls. If so, the differences in selfie-culture must be understood in light of the prevailing general gender culture, where female physical attractiveness is highly valued [45].

The present results should also be juxtaposed to findings suggesting a link between false self-presentation and poor mental health [23]. It is possible that adolescents who are preoccupied with self-presentation and the feedback they receive on social media are more likely to present themselves in a way that generates positive feedback, which may not correspond to their true self. This may be particularly true for use of social media platforms that very much are based on visual self-presentation, and thus may confer more use of retouching of self-portraits.

Implications and public health relevance

For adolescents, our findings highlight the importance of awareness regarding how different types of activities on social media may be related to mental health outcomes. Today's adolescents are social media 'natives' [46], i.e., they have grown up in an "online world". In contrast, many adults are "social media immigrants", and this native/immigrant distinction may reduce parents' understanding of and insight into adolescents' online lives [47]. Parental involvement in relation to social media use has been reported to be stronger in younger ages [48]. Continued parental involvement during late childhood and early adolescence may therefore be important to mitigate potential negative effects of social media use [48, 49]. Gómez and colleagues encourages for instance the empowerment of parents to moderate their offspring [48]. Similarly, the schools and teachers may play an important role in increasing awareness and knowledge about the use of social media. Chua and Chang suggest that educational programs that increase social media literacy can be beneficial when they also target negative consequences due to excessive peer comparison and the need for online feedback [41].

Our findings suggest that not only the amount of use on social media should be considered but also the role of self-presentation. A recent review covering the association between social media use and well-being among adolescents highlighted among other things the negative association between well-being and social media use through high investment and negative feedback [29]. They also asserted the need for intervention programs and educational programs that could address potential risks of social media relation to subjective well-being [29]. Specifically, they listed improved education and awareness among adolescents themselves, as well as the school as an optimal place to facilitate critical thinking about social media use and potential consequences.

Strengths and limitations

The present study holds some strengths. First, the measures of mental health and quality of life are widely used and validated scales [30–32]. Second, the questions related to focus on self-presentation on social media were specifically developed for the purposes of the survey. Specifically, the questions related to focus on self-presentation were derived from four focus-groups where social media, mental health and well-being was the overarching topic. Third, the survey is recent and included both girls and boys. Several limitations are also important to mention. First, the study is cross-sectional, and causality cannot be inferred. Second, the sample size is relatively small, limiting the meaningfulness of subgroup analyses, and the inclusion of potential confounders and moderators in our analyses due to lack of statistical power. For instance, the finding of a non-significant association between focus on self-presentation and

quality of life among boys may reflect the true relationship between the variables, be due to limited statistical precision or due to confounding factors. Third, the survey did not include measures of frequency or duration of social media use among adolescents. However, such measure are likely to be inaccurate and biased [50, 51], and may be non-germane [5–7, 20]. Fourth, the study population was limited to one senior high school in Norway, which is likely to reduce the generalisability of our findings. Related to this, the participation was moderate, and this may impact the validity of our findings vis-à-vis the study population. However, several studies have indicated that low participation rate is more detrimental to prevalence estimates than estimates related to associations between variables [52]. Fifth, only a small proportion of the sample reported retouching pictures, and given the general availability of different photo-filters in different social media apps, our numbers seem low. Although we cannot confirm it, there is a strong possibility that this question was taken as editing of photos which goes beyond built-in filters and more along the lines of manually editing particular parts of the photos.

Conclusion

The present study is the first study we are aware of that have examined the association between focus on self-presentation on social media and mental health and quality of life among adolescents. The study contributes with new knowledge about a specific aspect of social media use, highlighted as potentially particularly important to increase our understanding of the link between social media use and mental health among adolescents. Our findings indicate that there is a medium strong and consistent relationship between focus on self-presentation and symptoms of anxiety and depression among adolescents, while there may be gender differences for the relationship with quality of life. The reported relationship could have important public health implications for adolescents, especially due to the way many social media platforms actively encourages a focus on self-presentation, social comparison and presentations of the "perfect life". Due to the limitations of the present study, future studies should investigate the relationships reported in larger study samples, in more diverse samples of adolescents and in a longitudinal rather than cross-sectional design.

Abbreviations

Dep
Depression
GAD
Generalized Anxiety Disorder
GAD-7
General Anxiety Disorder 7
QoL
Quality of Life
g
Hedges' g

M
Mean
SD
Standard Deviation,
95%CI
95% Confidence intervals
SMD
Standardised mean difference.
SMFQ
Short Mood and Feelings Questionnaire
SOME
Social media
WEMWBS
Warwick-Edinburgh Well-being Scale

Declarations

Ethics approval and consent to participate

The survey was approved by the Regional Ethics Committee (REK) in Norway (REK#65611). All participants gave their informed consent upon participation and were informed about the general purpose of the survey as well as the opportunity to withdraw from the study even after initial participation.

Consent for publication

Not required.

Competing interests

None declared.

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Author's contributions

JCS conceived the project and planned the initial aims and statistical analyses. JCS performed the statistical analyses in collaboration with GHJ. JCS wrote the first draft in collaboration with GHJ. TB, RTH

and AKK co-authored all parts of the manuscript and provided additional input on the statistical plan. All authors contributed to the interpretation of the results and critically reviewed the final manuscript. The authors read and approved the final manuscript before submission.

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Availability of data and materials

The Norwegian Health research legislation and the Norwegian Ethics committees require explicit consent from the participants in order to transfer health research data outside of Norway. For the data employed in the present study, ethics approval was also contingent on storing the research data on secure storage facilities located at the Norwegian Institute of Public Health, which prevents us from providing the data as supplementary information or to transfer it to data repositories. Individual requests for data access should be sent to research project leader: jens.christoffer.skogen@fhi.no.

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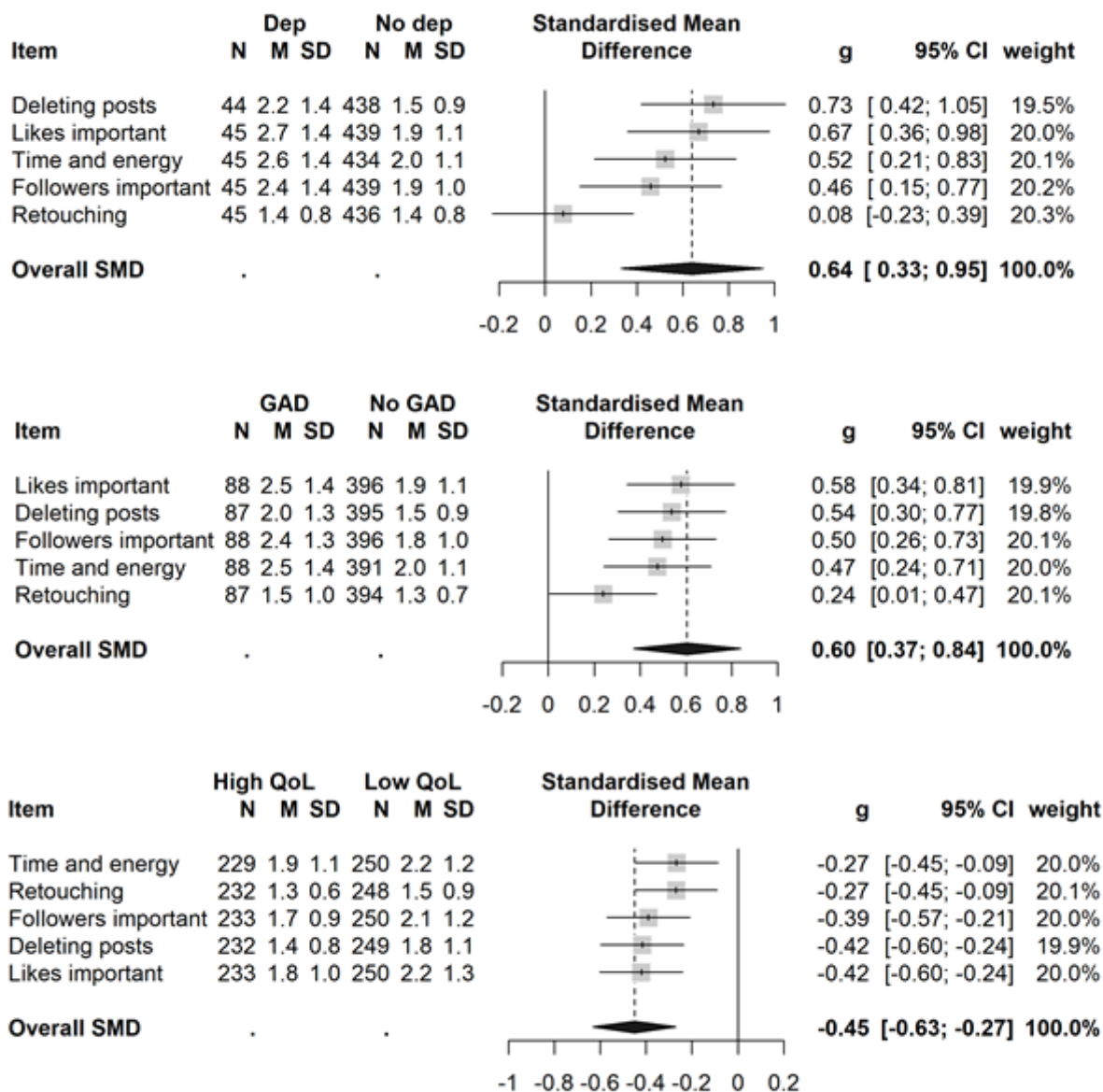
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Figures

Dep / No dep

Item	Dep N	M	SD	No dep N	M	SD	g	95% CI	weight
Deleting posts	44	2.2	1.4	438	1.5	0.9	0.73	[0.42; 1.05]	19.5%
Likes important	45	2.7	1.4	439	1.9	1.1	0.67	[0.36; 0.98]	20.0%
Time and energy	45	2.6	1.4	434	2.0	1.1	0.52	[0.21; 0.83]	20.1%
Followers important	45	2.4	1.4	439	1.9	1.0	0.46	[0.15; 0.77]	20.2%
Retouching	45	1.4	0.8	436	1.4	0.8	0.08	[-0.23; 0.39]	20.3%
Overall SMD	.			.			0.64	[0.33; 0.95]	100.0%

GAD / No GAD

Item	GAD N	M	SD	No GAD N	M	SD	g	95% CI	weight
Likes important	88	2.5	1.4	396	1.9	1.1	0.58	[0.34; 0.81]	19.9%
Deleting posts	87	2.0	1.3	395	1.5	0.9	0.54	[0.30; 0.77]	19.8%
Followers important	88	2.4	1.3	396	1.8	1.0	0.50	[0.26; 0.73]	20.1%
Time and energy	88	2.5	1.4	391	2.0	1.1	0.47	[0.24; 0.71]	20.0%
Retouching	87	1.5	1.0	394	1.3	0.7	0.24	[0.01; 0.47]	20.1%
Overall SMD	.			.			0.60	[0.37; 0.84]	100.0%

High QoL / Low QoL

Item	High QoL N	M	SD	Low QoL N	M	SD	g	95% CI	weight
Time and energy	229	1.9	1.1	250	2.2	1.2	-0.27	[-0.45; -0.09]	20.0%
Retouching	232	1.3	0.6	248	1.5	0.9	-0.27	[-0.45; -0.09]	20.1%
Followers important	233	1.7	0.9	250	2.1	1.2	-0.39	[-0.57; -0.21]	20.0%
Deleting posts	232	1.4	0.8	249	1.8	1.1	-0.42	[-0.60; -0.24]	19.9%
Likes important	233	1.8	1.0	250	2.2	1.3	-0.42	[-0.60; -0.24]	20.0%
Overall SMD	.			.			-0.45	[-0.63; -0.27]	100.0%

Figure 1

Associations between quality of life, depression and generalized anxiety, and self-reported focus on self-presentation on social media. Abbreviations: Dep: Depression, GAD; Generalized Anxiety Disorder, QoL: Quality of Life, g: Hedges' g, M: Mean, SD; Standard Deviation, 95%CI: 95% Confidence intervals, SMD: Standardised mean difference. Quality of Life: Median split; Depression: 90th Percentile; GAD; Score 10+; Insomnia: DSM-IV proxy, Overall SMD: SMD of summed mean score on the five items of self-presentation. Overall estimates are fixed effects estimates.
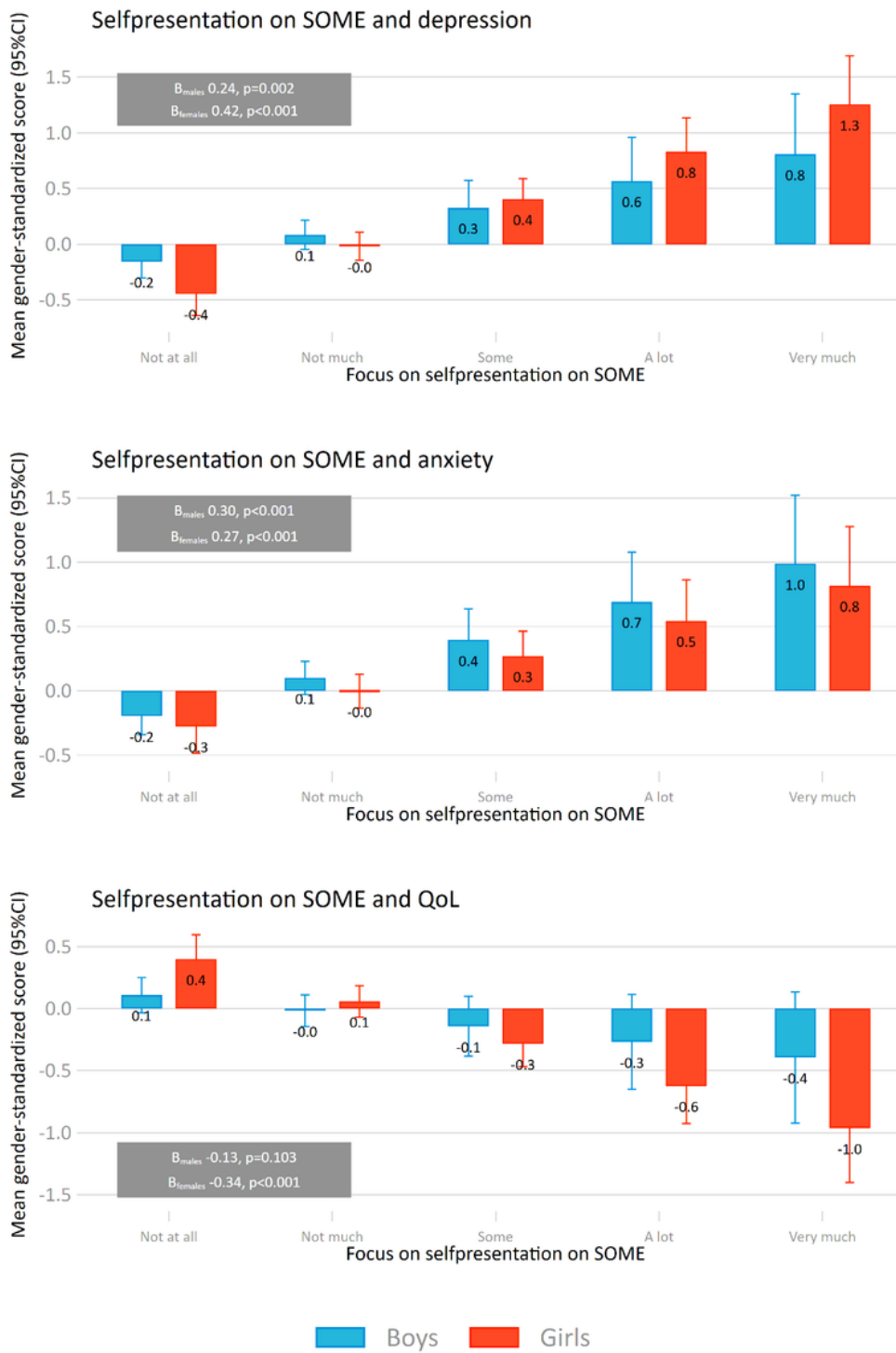
Figure 2

Associations between quality of life, depression and generalized anxiety, and self-reported focus on self-presentation on social media. Gender-stratified. Bars denote predicted deviation from gender-specific mean with 95% confidence intervals. Standardized score for trend in textboxes.