

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Divergent decennial trends in mental health according to age reveal poorer mental health for young people. Repeated cross-sectional population-based surveys from the HUNT Study, Norway
AUTHORS	Krokstad, Steinar; Weiss, Daniel; Krokstad, Morten; Rangul, Vegar; Kvaløy, Kirsti; Ingul, Jo; Bjerkeset, Ottar; Twenge, Jean; Sund, Erik

VERSION 1 – REVIEW

REVIEWER	Chakraborty, Nandini Leicestershire Partnership NHS Trust
REVIEW RETURNED	01-Nov-2021

GENERAL COMMENTS	This is a very thorough well planned study with significant findings. The limitations of self-reporting and the possibility that a greater awareness of mental health issues might have affected the findings in the younger population is already stated by the authors. I only wonder if the authors would like to comment on suggestions for further research- whether such findings are a simply a result of greater awareness or if there is a correlation with functional outcomes such as school absence/truancy or sickness at employment. This may have to be explored in future.
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REVIEWER	McGillivray, Lauren Black Dog Institute
REVIEW RETURNED	12-Jan-2022

GENERAL COMMENTS	BMJ Open January 2022 Paradoxical trends in mental health in the society and the root causes of increased mental health problems among young people. The HUNT Study, Norway Thank you for the opportunity to review this interesting study. This manuscript describes a study examining changes in mental health, by age and gender, among a population-based sample from Norway, over three decades – from 1995 to 2019. Repeated surveys measuring depression and anxiety were used to monitor decennial changes. Their main findings were that trends in depression and anxiety amongst adolescents and young adults increased sharply, especially between 2006-08 and 2017-19, while they declined among adults ages 60 and over. I believe there are some major issues that need addressing, particularly relating to
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the focus on technology use as the explanation for the current findings. My comments for the authors are delineated below.

The study meets most acceptance criteria: it is ethical; the material is original; the data are novel and valid; the study methods are appropriate; the writing is generally succinct and clear; and references are appropriate. However, there are some unacceptable criteria: a broader review of the literature in the introduction would strengthen the paper; one of the conclusions made are not based on findings in the study; overall, the paper appears to finish as a political writing.

Major Comments

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I suggest a change to the currently title, to language and punctuation to be more specific to your data, e.g., "Paradoxical trends in population-based mental health outcomes over three decades: The HUNT Study, Norway". For instance, the study does not collect data on 'the root causes' of increased mental health problems, so this is a misleading title. more information about the participant group should be included (ie population-based, time-frame, and/or sample size).

Abstract lines 12-13: I don't think this is an accurate description of what the study did, "discuss these changes based on current understandings of health promotion and disease prevention strategies". This additional aim is included in the abstract but not in text. Also, lines 33-34: I don't think you can make such a certain statement based on your current findings, which did not directly examine the impact of technology use.

Introduction: the authors discuss underlying conditions that drive social determinants of health over the past decade to help explain trends in mental health, which I acknowledge is extremely important and valid. Within this, there is a deeper discussion of an expansion in global interactions resulting in increased IT, 'dataism', and consumerism of technology. While this change may be the most obvious, I think there needs to be acknowledgement that this is just one of the major changes within the past decade. For instance, there has also been a dramatic rise in climate crisis events/awareness/coverage.

Discussion: again, the primary focus of explanation of your data is pinned to the technology industry. While possible explanations need to be considered, this specific study did not collect data on technology use and so a more broad view of possible explanations would strengthen the discussion. As it currently reads, the authors appear to have a strong political agenda.

Specific Comments

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Page18: the colouration of the figure is difficult to read clearly. I would suggest changing all colours to pale (not dark green or navy) with black text consistently.

Page19: I recommend changing the figure labels from 'girls | boys' to 'female | male' and provide age range or state 'adolescence'. Also, the sizes of the coloured squares in the 'key' could be more consistent.

	<p>Page20: both figures do not have labels for the 'y axis' (or they may have been cut off) – please ensure that the final version has labels for both axes. While these are described in the figure titles, they should be decipherable without a title.</p> <p>Page10, lines 45-49: Please expand on the manipulative and exploitative strategies that influence young people's behaviour. E.g., strategies to increase technology usage?</p> <p>Page 10, line 50: This sentence opens with "other detrimental effects from the overuse of online technologies" however no previous reasons were discussed just stated that overuse has been shown to be detrimental. Suggest changing this to, "These detrimental effects may be explained by(loneliness, sleep deprivation etc)" or something similar.</p> <p>Page 10, lines 53-55: are the authors suggesting that non-population based studies (ie individual data) are not generalizable? I recommend making this point more clear.</p> <p>Page 10, line 57: please expand on how non-users of technology could be impacted by changes in social interaction caused by tech use.</p> <p>Page 11, lines 3-5: are the authors suggesting that non/less-technology use amongst older people has lead to the improvement in their mental health? I don't think technology use can be implicated in this finding without references.</p> <p>Page 11, lines 9-12: The authors argue that "older individuals may also be more skilled at emotional regulation and complex social decision making" compared to young people and therefore the "youngest generation, iGen/GenZ, is affected most negatively by the changes in technology." Again, the authors need to consider that poorer emotional regulation would be detrimental to adapting to most change (including technology) and overcoming adversity in general.</p> <p>Page 11, lines 13-16: the considerations in this sentence needs to be expanded on.</p> <p>Page 11, lines 18-29: I recommend that this final paragraph of the discussion be removed and replaced with a more thorough discussion of alternative considerations (as mentioned in comment 12). However the last sentence, which has references, could be retained. While the authors raise valid points about dominating political ideologies affecting population mental health, this paragraph reads more like an editorial commentary than scientific discussion of the present findings. Emotive language does not help (e.g., "may be at risk of abandoning an entire generation of young people.")</p> <p>Page 11, line 49: suggest changing 'weaknesses' to limitations.</p> <p>Page 11, line 56: This sentence appears to be cut short/missing words, "lower social status than participants....?" Also, I think there needs to be acknowledgement that if non-participants were included in the later data collection that depression and anxiety outcomes may have and explicitly state</p> <p>Page 11, line 59 onwards: this fits better in the discussion section.</p> <p>Page 12, line 27: suggest replacing emotive language 'fear' with concern, predict, or something similar.</p> <p>Page 12, line 32 onward: this paragraph should provide further topics for research, to expand on your good work. Specifically, studies investigating driving factors underlying increased mental health problems in young people would be beneficial. I don't think the actions outlined in this section can be provided based on this study alone (i.e., regulation of technology). Further, the authors provide very specific regulation measures without any references of an evidence-base for the effectiveness of same. Therefore, you</p>
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	<p>could suggest further research into this, or provide broader targets (which may include regulation of tech).</p> <p>Page 13 lines 3 onward: these conclusions cannot be made based on your study findings. I am impressed by the passion of the authors, but I strongly suggest a rephrase of this emotive sentence in particular, "The mental health of young generations must not be sacrificed on the neoliberal altar." as it conjures images of satanic ritual.</p> <p>Thank you and good luck.</p>
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REVIEWER	White, Jacquie University of Hull, FHS
REVIEW RETURNED	17-Jan-2022

GENERAL COMMENTS	<p>Very interested to read this well presented study and paper. The only comment I have relates to language used to describe Figure 1, the title on page 6 (line 34) of the PDF. I thought the use of "attendance" rates was odd and probably meant response rates. I also thought the emphasis on potential neoliberal policy, globalisation and an expanding tech industry as the likely trend for poorer self-rated mental health of young people was likely but there could be other reasons not discussed here, such as the impact of a reduction of stigma in reducing the barriers for young people in disclosing psychological symptoms and/or changing parenting styles.</p>
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VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Dr. Nandini Chakraborty, Leicestershire Partnership NHS Trust Comments to the Author:

This is a very thorough well planned study with significant findings. The limitations of self-reporting and the possibility that a greater awareness of mental health issues might have affected the findings in the younger population is already stated by the authors.

I only wonder if the authors would like to comment on suggestions for further research- whether such findings are a simply a result of greater awareness or if there is a correlation with functional outcomes such as school absence/truancy or sickness at employment. This may have to be explored in future.

Recommended changes have been made, the discussion is expanded

Reviewer: 2

Dr. Lauren McGillivray, Black Dog Institute Comments to the Author:

Thank you for the opportunity to review this interesting study. This manuscript describes a study examining changes in mental health, by age and gender, among a population-based sample from Norway, over three decades – from 1995 to 2019. Repeated surveys measuring depression and anxiety were used to monitor decennial changes. Their main findings were that trends in depression and anxiety amongst adolescents and young adults increased sharply, especially between 2006-08 and 2017-19, while they declined among adults ages 60 and over. I believe there are some major issues that need addressing, particularly relating to the focus on technology use as the explanation for the current findings. My comments for the authors are delineated in the attached file.

The study meets most acceptance criteria: it is ethical; the material is original; the data are novel and valid; the study methods are appropriate; the writing is generally succinct and clear; and references are appropriate. However, there are some unacceptable criteria: a broader review of the literature in the introduction would strengthen the paper; one of the conclusions made are not based on findings in the study; overall, the paper appears to finish as a political writing.

Recommended changes in the text have been made, a broader review of the literature in the introduction is provided; the conclusions are changed

Major Comments

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1. I suggest a change to the currently title, to language and punctuation to be more specific to your data, e.g., "Paradoxical trends in population-based mental health outcomes over three decades: The HUNT Study, Norway". For instance, the study does not collect data on 'the root causes' of increased mental health problems, so this is a misleading title. more information about the participant group should be included (ie population-based, time-frame, and/or sample size).

The title is revised following the preferred format

2. Abstract lines 12-13: I don't think this is an accurate description of what the study did, "discuss these changes based on current understandings of health promotion and disease prevention strategies". This additional aim is included in the abstract but not in text. Also, lines 33-34: I don't think you can make such a certain statement based on your current findings, which did not directly examine the impact of technology use.

Recommended changes in the text have been made

3. Introduction: the authors discuss underlying conditions that drive social determinants of health over the past decade to help explain trends in mental health, which I acknowledge is extremely important and valid. Within this, there is a deeper discussion of an expansion in global interactions resulting in increased IT, 'dataism', and consumerism of technology. While this change may be the most obvious, I think there needs to be acknowledgement that this is just one of the major changes within the past decade. For instance, there has also been a dramatic rise in climate crisis events/awareness/coverage.

Recommended expansion of the introduction have been made

4. Discussion: again, the primary focus of explanation of your data is pinned to the technology industry. While possible explanations need to be considered, this specific study did not collect data on technology use and so a more broad view of possible explanations would strengthen the discussion. As it currently reads, the authors appear to have a strong political agenda.

Recommended expansion of the introduction have been made

Specific Comments

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5. Page18: the colouration of the figure is difficult to read clearly. I would suggest changing all

colours to pale (not dark green or navy) with black text consistently.

Recommended changes have been made

6. Page19: I recommend changing the figure labels from 'girls | boys' to 'female | male' and provide age range or state 'adolescence'. Also, the sizes of the coloured squares in the 'key' could be more consistent.

Recommended changes in the figure have been made

7. Page20: both figures do not have labels for the 'y axis' (or they may have been cut off) – please ensure that the final version has labels for both axes. While these are described in the figure titles, they should be decipherable without a title.

Recommended changes in the figure have been made

8. Page10, lines 45-49: Please expand on the manipulative and exploitative strategies that influence young people's behaviour. E.g., strategies to increase technology usage?

Recommended changes in the text have been made

9. Page 10, line 50: This sentence opens with "other detrimental effects from the overuse of online technologies" however no previous reasons were discussed just stated that overuse has been shown to be detrimental. Suggest changing this to, "These detrimental effects may be explained by ...(loneliness, sleep deprivation etc)" or something similar.

Recommended changes have been made

10. Page 10, lines 53-55: are the authors suggesting that non-population based studies (ie individual data) are not generalizable? I recommend making this point more clear.

We do not quite understand the critique, but have expanded the discussion

11. Page 10, line 57: please expand on how non-users of technology could be impacted by changes in social interaction caused by tech use.

Recommended changes in the text have been made

12. Page 11, lines 3-5: are the authors suggesting that non/less-technology use amongst older people has lead to the improvement in their mental health? I don't think technology use can be implicated in this finding without references.

Recommended changes on how non-users of technology could be impacted by changes in social interaction caused by tech use have been made

13. Page 11, lines 9-12: The authors argue that "older individuals may also be more skilled at emotional regulation and complex social decision making" compared to young people and

therefore the “youngest generation, iGen/GenZ, is affected most negatively by the changes in technology.” Again, the authors need to consider that poorer emotional regulation would be detrimental to adapting to most change (including technology) and overcoming adversity in general.

The discussion is changed

14. Page 11, lines 13-16: the considerations in this sentence needs to be expanded on.

Recommended changes have been made

15. Page 11, lines 18-29: I recommend that this final paragraph of the discussion be removed and replaced with a more thorough discussion of alternative considerations (as mentioned in comment 12). However the last sentence, which has references, could be retained. While the authors raise valid points about dominating political ideologies affecting population mental health, this paragraph reads more like an editorial commentary than scientific discussion of the present findings. Emotive language does not help (e.g., “may be at risk of abandoning an entire generation of young people.”)

Recommended changes in the text have been made

16. Page 11, line 49: suggest changing ‘weaknesses’ to limitations.

Recommended changes have been made

17. Page 11, line 56: This sentence appears to be cut short/missing words, “lower social status than participants....?” Also, I think there needs to be acknowledgement that if non-participants were included in the later data collection that depression and anxiety outcomes may have and explicitly state

Recommended changes have been made

18. Page 11, line 59 onwards: this fits better in the discussion section.

The text is moved, and recommended changes have been made

19. Page 12, line 27: suggest replacing emotive language ‘fear’ with concern, predict, or something similar.

Recommended changes have been made

20. Page 12, line 32 onward: this paragraph should provide further topics for research, to expand on your good work. Specifically, studies investigating driving factors underlying increased mental health problems in young people would be beneficial. I don’t think the actions outlined in this section can be provided based on this study alone (i.e., regulation of technology). Further, the authors provide very specific regulation measures without any references of an evidence-base for the effectiveness of same. Therefore, you could suggest further research into this, or provide broader targets (which may include regulation of tech).

Recommended changes in the text have been made

21. Page 13 lines 3 onward: these conclusions cannot be made based on your study findings. I am impressed by the passion of the authors, but I strongly suggest a rephrase of this emotive sentence in particular, "The mental health of young generations must not be sacrificed on the neoliberal altar." as it conjures images of satanic ritual.

Recommended changes have been made, the conclusions are modified

Reviewer: 3

Dr. Jacquie White, University of Hull

Comments to the Author:

Very interested to read this well presented study and paper. The only comment I have relates to language used to describe Figure 1, the title on page 6 (line 34) of the PDF. I thought the use of "attendance" rates was odd and probably meant response rates. I also thought the emphasis on potential neoliberal policy, globalisation and an expanding tech industry as the likely trend for poorer self-rated mental health of young people was likely but there could be other reasons not discussed here, such as the impact of a reduction of stigma in reducing the barriers for young people in disclosing psychological symptoms and/or changing parenting styles.

Recommended changes have been made

VERSION 2 – REVIEW

REVIEWER	McGillivray, Lauren Black Dog Institute
REVIEW RETURNED	18-Mar-2022

GENERAL COMMENTS	<p>BMJ Open</p> <p>18th March 2022</p> <p>Paradoxical trends in mental health in the society and the root causes of increased mental health problems among young people. The HUNT Study, Norway</p> <p>Divergent decennial trends in mental health according to age. Which underlying causes may drive the increases in mental health issues for young people? Repeated cross-sectional population-based surveys from the HUNT Study, Norway</p> <p>Thank you for the opportunity to re-review this revised study. The changes made to the manuscript have improved its readability, however there are still some minor issues that should be addressed before publication. My comments are outlined below.</p> <p>Specific Comments =====</p> <p>1. Abstract: "strong increase in mental health symptoms" reads as if symptoms of health have increased. I suggest changing this to mental illness, mental disorder symptoms, strong decrease in mental health, or similar. For example, there is no 'physical health</p>
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	<p>symptoms' but there is physical illness and symptoms of physical illness.</p> <p>2. There are some new, minor grammatical errors that need addressing throughout. For example, "Similar analyses from HUNT data in Norway have shown significant effects between the number of hours of screen time and increased mental health issues, (which was?) particularly strong when this screen time is predominantly (involved?) the use of social media and internet. These effects are (were) significantly strengthened both for girls and for number of hours"</p> <p>3. I think you could specify how your suggestions are based, ie on 'x' theory, interdisciplinary literature etc? "The aim of this paper was to describe the parallel changes in mental health among adolescents and adults in a Norwegian population over the three last decades and suggest some potential explanations for these changes (based on.....)".</p> <p>4. Discussion: the logic here is not sound, "In recent years, mental health has received increased attention in the Norwegian society. As a result, it may have become easier for participants to report mental health concerns and express emotion in questionnaires. Therefore, a desire by the participant to provide socially desirable responses may have affected the results."</p> <p>It is not clear how ease of expressing emotion relates to providing socially desirable responses on mental health survey. And does this explain trends seen in adolescents or older adults?</p> <p>5. I don't understand what is being said here: "For the adult participants, we have used a different tool than for adolescents, HADS, which showed the exact same trend for participants aged 20-39 years as the SCL-5 in adolescents and opposite trends for the elderly. This supports the validity of our findings."</p> <p>6. "In addition, similar increases in mental health issues in countries such as the U.S. have been accompanied by concurrent increases in hospital admissions for self-harm behaviors and suicide attempts that cannot be attributed to changes in (symptoms of mental disorder on?) survey self-reports.^{44 45} It is possible to suggest that all these changes are due to trends in increasing socio-cultural openness towards mental health issues, however lin parallel with the changes we see in our data, otherbehavioral data has showing similar trends⁴⁰ and a clear decline in young people's reporting of happiness and life satisfaction overin the last ten years.,³⁴ this seems unlikely."</p> <p>Are the authors saying that increasing self-harm and suicide attempts are due to sociocultural openness towards mental health issues? The second sentence in this paragraph is confusing and I don't know what argument you are trying to make for me to assess it.</p> <p>7. With the exception of modern technology (internet), all of these concerns did exist 30 years ago. Perhaps you mean to say that the preexisting issues (climate crisis, social injustice, threats to democracy) have been escalating in recent decades?: "To determine the causes behind such public health trends, is, however, challenging. Younger generations clearly face concerns</p>
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	<p>that did not exist to the same extent even 10, 20 or 30 years ago. These include climate change, growing social injustice,⁴⁶ emerging threats to democratic institutions and the consequences of modern technological developments”</p> <p>8. “In addition, higher academic pressure reflects the dominant neoliberal political preoccupation with competition.³³ When young people’s sense of self-worth is dependent on what they achieve in school, it can also lead to anxiety and depression (if they start to perform poorly?)”.</p> <p>Thank you and good luck.</p>
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REVIEWER	White, Jacquie University of Hull, FHS
REVIEW RETURNED	11-Mar-2022

GENERAL COMMENTS	<p>A considerable amount of work has been done to address the concerns raised in the earlier review of this paper which is very welcome. However, some issues remain regarding the need to balance your view that the conditions driving an upward trend in prevalence of subjective anxiety and depression symptoms reported by adolescent and young adults in repeated population-based health surveys in Norway are due to the increased influence of screen-based media, rather than other potential influencing factors. It is important to make sure all of this is addressed because the study reported here was not designed to investigate the impact of screen-based media on the survey participants. I appreciate that the discussion has been broadened to include other potential factors and welcome this. What I am highlighting here is where I think further changes are needed to avoid misrepresentation of your results.</p> <p>Page and line numbers refer to the PDF.</p> <p>1. The inclusion of "Which underlying causes may drive the increases in mental health issues for young people?" in the title is not specific to your data or research design. This aspect of the paper is opinion and discussion (related to the broader literature and evidence, but you are not reporting a systematic review to answer this question). Please remove this phrase from the title.</p> <p>2. Page 7: lines 96-97 Although the second issue described by Rose is the determination of incidence rates, you are not presenting a study that "seeks the causes of changing incidence of health problems in the population". I do agree with the aim of your paper (lines 144-146), in terms of suggesting some potential explanations but it is important to be clear throughout that your study was not designed to seek causes.</p> <p>3. A comment about language. Please avoid using the term "mental health illness" (page 9. line 254) as it really makes no sense. I think you are probably referring to mental illness here because you cite increasing numbers accessing treatment services and medication. Mental health is different to mental illness or disorder (with health at the other end of the spectrum from ill health). It is possible to talk about good or poor mental health but not mental health illness. You also use the term "mental</p>
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	<p>health issues" on page 11 (line 331), and "mental health symptoms" on page 15 (line 368) but I think if you are referring to symptoms of mental disorder or illness or access to mental health services or treatment this means a threshold for clinical diagnosis (and therefore ill health) has been met. You also use the term "mental stress" on page 11 (line 342). Please review the paper and decide if you are referring to mental distress or symptoms of mental illness ,and make sure you use accurate and consistent labels for these throughout to avoid any confusion for the reader.</p>
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VERSION 2 – AUTHOR RESPONSE

Reviewer: 3

Dr. Jacquie White, University of Hull

Comments to the Author:

A considerable amount of work has been done to address the concerns raised in the earlier review of this paper which is very welcome. However, some issues remain regarding the need to balance your view that the conditions driving an upward trend in prevalence of subjective anxiety and depression symptoms reported by adolescent and young adults in repeated population-based health surveys in Norway are due to the increased influence of screen-based media, rather than other potential influencing factors. It is important to make sure all of this is addressed because the study reported here was not designed to investigate the impact of screen-based media on the survey participants. I appreciate that the discussion has been broadened to include other potential factors and welcome this. What I am highlighting here is where I think further changes are needed to avoid misrepresentation of your results.

Page and line numbers refer to the PDF.

1.The inclusion of "Which underlying causes may drive the increases in mental health issues for young people?" in the title is not specific to your data or research design. This aspect of the paper is opinion and discussion (related to the broader literature and evidence, but you are not reporting a systematic review to answer this question). Please remove this phrase from the title.

The title is revised, and we hope we now capture two important aspects: Divergent decennial trends in mental health according to age and poorer mental health for young people

2. Page 7: lines 96-97 Although the second issue described by Rose is the determination of incidence rates, you are not presenting a study that "seeks the causes of changing incidence of health problems in the population". I do agree with the aim of your paper (lines 144-146), in terms of suggesting some potential explanations but it is important to be clear throughout that your study was not designed to seek causes.

We have deleted the text that could be misunderstood.

3. A comment about language. Please avoid using the term "mental health illness" (page 9. line 254) as it really makes no sense. I think you are probably referring to mental illness here because you cite increasing numbers accessing treatment services and medication.

Yes, *illness* is used here to cite increasing numbers accessing treatment services and medication, and we think that is correct use of the word here.

Mental health is different to mental illness or disorder (with health at the other end of the spectrum from ill health). It is possible to talk about good or poor mental health but not mental health illness. You also use the term "mental health issues" on page 11 (line 331), and "mental health symptoms" on page 15 (line 368) but I think if you are referring to symptoms of mental disorder or illness or access to mental health services or treatment this means a threshold for clinical diagnosis (and therefore ill health) has been met. You also use the term "mental stress" on page 11 (line 342). Please review the paper and decide if you are referring to mental distress or symptoms of mental illness ,and make sure you use accurate and consistent labels for these throughout to avoid any confusion for the reader.

The unfortunate phrase *mental health symptoms* is replaced with *depression and anxiety symptoms* I the manuscript.

Reviewer: 2

Dr. Lauren McGillivray, Black Dog Institute

Comments to the Author:

Thank you for the opportunity to re-review this revised study. The changes made to the manuscript have improved its readability, however there are still some minor issues that should be addressed before publication.

Specific Comments

=====

1. Abstract: "strong increase in mental health symptoms" reads as if symptoms of health have increased. I suggest changing this to mental illness, mental disorder symptoms, strong decrease in mental health, or similar. For example, there is no 'physical health symptoms' but there is physical illness and symptoms of physical illness.

The text is changed to *decrease in mental health*

2. There are some new, minor grammatical errors that need addressing throughout. For example, "Similar analyses from HUNT data in Norway have shown significant effects between the number of hours of screen time and increased mental health issues, (which was?) particularly strong when this

screen time is predominantly (involved?) the use of social media and internet. These effects are (were) significantly strengthened both for girls and for number of hours”

These necessary changes have been implemented.

3. I think you could specify how your suggestions are based, ie on ‘x’ theory, interdisciplinary literature etc? “The aim of this paper was to describe the parallel changes in mental health among adolescents and adults in a Norwegian population over the three last decades and suggest some potential explanations for these changes (based on.....)”.

These suggested changes have been implemented.

4. Discussion: the logic here is not sound, “In recent years, mental health has received increased attention in the Norwegian society. As a result, it may have become easier for participants to report mental health concerns and express emotion in questionnaires. Therefore, a desire by the participant to provide socially desirable responses may have affected the results.” It is not clear how ease of expressing emotion relates to providing socially desirable responses on mental health survey. And does this explain trends seen in adolescents or older adults?

We have clarified our language.

5. I don’t understand what is being said here: “For the adult participants, we have used a different tool than for adolescents, HADS, which showed the exact same trend for participants aged 20-39 years as the SCL-5 in adolescents and opposite trends for the elderly. This supports the validity of our findings.”

We have explained our theory in a clearer way by adding *The fact that two different instruments show the same trend.*

6. “In addition, similar increases in mental health issues in countries such as the U.S. have been accompanied by concurrent increases in hospital admissions for self-harm behaviors and suicide attempts that cannot be attributed to changes in (symptoms of mental disorder on?) survey selfreports.^{44 45} It is possible to suggest that all these changes are due to trends in increasing sociocultural openness towards mental health issues, however in parallel with the changes we see in our data, other behavioral data has showing similar trends⁴⁰ and a clear decline in young

people's reporting of happiness and life satisfaction over the last ten years.,³⁴ this seems unlikely.” Are the authors saying that increasing self-harm and suicide attempts are due to sociocultural openness towards mental health issues? The second sentence in this paragraph is confusing and I don't know what argument you are trying to make for me to assess it.

We have changed the text which could be confusing.

7. With the exception of modern technology (internet), all of these concerns did exist 30 years ago.

Perhaps you mean to say that the preexisting issues (climate crisis, social injustice, threats to democracy) have been escalating in recent decades?: “To determine the causes behind such public health trends, is, however, challenging. Younger generations clearly face concerns that did not exist to the same extent even 10, 20 or 30 years ago. These include climate change, growing social injustice,⁴⁶ emerging threats to democratic institutions and the consequences of modern technological developments”

Yes, we have meant to highlight the increase in significance of these concerns, however, understand that the language used here could be misleading. Therefore, we have changed the text in the manuscript to read:

“To determine the causes behind such public health trends, is, however, challenging. Younger generations clearly face concerns that have increased in significance and importance throughout the previous few decades. These include worsening climate change, growing social injustice,⁴⁶ emerging threats to democratic institutions and the propagation of consequences related to the advent of innovative modern technological developments.”

8. “In addition, higher academic pressure reflects the dominant neoliberal political preoccupation with competition.³³ When young people's sense of self-worth is dependent on what they achieve in school, it can also lead to anxiety and depression (if they start to perform poorly?)”.

A clarifying text has been added.

VERSION 3 – REVIEW

REVIEWER	White, Jacquie University of Hull, FHS
REVIEW RETURNED	28-Apr-2022

GENERAL COMMENTS	<p>I am happy with the majority of changes made in response to my previous peer review (of the second manuscript submission), thank you for making these changes. However I still think the issues I raised about the use of the term "mental health illness", " have not been fully addressed, and maybe not completely understood. You state you believe the use of "illness" to be the correct word. It is where this word is coupled with mental health (the opposite of mental illness) that I identified as inconsistent and potentially confusing for the reader. I know "mental health illness" has slipped into general language usage but in an academic paper like this one I think it is really important to be clear if you are speaking about mental illness or mental health. there are some places where you addressed this but other places where the term remains (I counted 3 incidences of the use of "mental health illness". (on page 7, line 122; page 11 lines 245 and 255). The first example on page 11 was a change from mental health issues to mental health illness. Please look again at your use of this language and be clear if you are referring to a diagnosable mental illness (as highlighted in the global burden of disease studies cited) you use the term mental illness) or where you have referred to "mental health issues" or "mental health problems" these are experiences that do not meet the threshold for diagnosis. This may require you to go back and read the primary research you cite to understand if what has been reported by other authors is about illness or not. The important point here is not to confuse health with illness and to make sure you are consistent in the way you report your findings and the findings of those you cite in your paper. I would also recommend having a quick look at the epidemiological papers cited to make sure they are up to date . For example, your reference n 3. Loizano et al (2012).</p>
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VERSION 3 – AUTHOR RESPONSE

Response to review_3

Thank you for this review that makes it possible to improve this manuscript

Dr. Jacquie White, University of Hull

Comments to the Author:

I am happy with the majority of changes made in response to my previous peer review (of the second manuscript submission), thank you for making these changes. However I still think the issues I raised about the use of the term "mental health illness", " have not been fully addressed, and maybe not completely understood. You state you believe the use of "illness" to be the correct word. It is where this word is coupled with mental health (the opposite of mental illness) that I identified as inconsistent and potentially confusing for the reader. I know "mental health illness" has slipped into general language usage but in an academic paper like this one I think it is really important to be clear

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Thank you for helping us with the concepts mental health and mental illness. We have reviewed their use and changed the text accordingly.

I would also recommend having a quick look at the epidemiological papers cited to make sure they are up to date. For example, your reference n 3. Loizano et al (2012).

We have had a look but can not find anything wrong with the epidemiological papers cited. They are imported from PubMed to EndNote. However, we have added a translation of three Norwegian references.