Editor and Reviewer comments:

Editor:

I have now received three very strong reviews from experts in the field. The reviewers are positive about the research topic, and they note a number of strengths. However, they also note a large number of important points that need to be clarified before a final editorial decision can be made. All three reviewers recommend reconsideration after major revisions. Most of these points are clarifications, but a few will require potentially new data analyses and reporting.

Reviewer #1: 1. Summary

Manuscript Number: JEVP-D-22-00830

Title: Secondary stressors, stress, and resilience during a pandemic: The protective roles of social identity and social support

Summary: The preregistered study shows that secondary stressors are associated with lower well-being, especially for women and people with a lower SES. Social identification was associated with higher expected support which is associated with lower stress and higher resilience.

First of all, I thank the authors very much for this well-written manuscript. However, I have several major comments (see below). I am not too familiar with the literature on stress, so I did not comment extensively on this part. I also think it would have helped to have access to the preregistration since some details were missing when reading the manuscript.

**Comments in orange: clarifications**

**Comments in red: reanalysis**

2. Major comments to the authors

2.1. Abstract: It would be more accurate to phrase your results in terms of correlations rather than using words that imply causation ("negatively affect"; "increases"; "operate"). These may be replaced with "negatively associated" or "lower x is associated with lower y".

This also applies to the rest of the manuscript.

2.2. Introduction: I am not familiar with the literature on stress/stressors, so I cannot comment on this part. However, I think that Hypothesis 2 is not sufficiently justified. "Second, in line with the literature that highlights the negative effects of secondary stressors (Norris et al., 2002; Williams et al., 2021), we hypothesised that secondary stressors exert an additional negative impact on psychological outcomes (i.e., perceived stress and resilience) over and above the effects of primary stressors (H.secondary.stressors)." Could you expand on this a bit more?

2.3. Introduction: I am not entirely sure about the reasoning underlying Hypothesis 3. Where do the primary and secondary stressors come in here? Why don't you expect that the relationship between secondary/primary stressors and outcomes is moderated by social support?

Overall, I think the conceptual model you'd like to test is not entirely clear. Maybe it would help draw the relationship between all variables in one model rather than in 3 different ones.

2.4. Preregistration: I'm not sure if this (<https://eur01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fosf.io%2Fpg3h8&amp;data=05%7C01%7Cevangelos.ntontis%40open.ac.uk%7C4f7d7b16428a40564e9a08dabddd7569%7C0e2ed45596af4100bed3a8e5fd981685%7C0%7C0%7C638031056106003836%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&amp;sdata=%2B1fUC5tV5XCS7GOQTK0nVI0GSSq7qIsQY4MqmlNtgTE%3D&amp;reserved=0>) is the correct link to the preregistration. If so, four hypotheses had been preregistered, only 2 of which the authors state in their manuscript. Could you please clarify this and transparently highlight any deviations from the preregistration in an appendix?

Preregistration:

"H1: Social norms to follow preventive measures will be positively correlated with compliance with local prevention guidelines. H2: General vaccine hesitancy will be negatively correlated with the willingness to get a COVID-19 vaccine across countries. H3: (a) Primary stressors will have a negative effect on psychological outcomes (such as perceived stress), whereby higher levels of experienced primary stressors will be associated with worse psychological outcomes. (b) Secondary stressors will exert an additional negative impact on psychological outcomes over and above the effects of primary stressors. H4: Levels of trust (in the scientific community, public institutions or the government) will be positively correlated with (a) compliance behaviours, (b) vaccine willingness, and negatively correlated with (c) vaccine hesitancy and (d) stress."

2.5. Methods: "After data cleaning, there were 15,740 participants in the dataset". Could you please clarify what data cleaning meant (only complete cases, failed attention check etc.?) and provide a flow diagram in an appendix for the reader to better understand data exclusions?

Could you also make clearer when/whether participants/countries were dropped based on invariance testing?

2.6. Methods: Could you name a few examples of primary and secondary stressors?

2.7. Data analysis: In the preregistration (assuming this is the correct one), you specified that you would test whether a random intercept is necessary with an ICC cutoff of .50. The null model should therefore not contain the random intercept and should be tested against a model including a random intercept. Please also (at least for the Bayesian analyses) specify which family (I assume Gaussian) you used.

2.8. Results: It is a bit difficult to follow all the results. I would suggest putting the numbers in a table and reporting in words what you found, including explaining to readers what a BF of x means (i.e., data are x times more likely under H1 than H0). Same for the Bayesian credible interval. Maybe it would also make sense to only report the Bayesian or frequentist analyses and report the rest in an appendix or as a sensitivity analysis. Regarding sensitivity analyses, could you please also specify which priors you used for the main analyses. It would probably make sense as well to conduct a sensitivity analysis with different priors.

2.9. Results: I am concerned about the analysis of H2. The current approach of testing incremental validity is associated with extremely high false positive rates and essentially leads the more valid predictor to win. Structural Equation Modeling would be the appropriate method here (see Westfall & Yarkoni, 2016; <https://eur01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fjournals.plos.org%2Fplosone%2Farticle%3Fid%3D10.1371%2Fjournal.pone.0152719&amp;data=05%7C01%7Cevangelos.ntontis%40open.ac.uk%7C4f7d7b16428a40564e9a08dabddd7569%7C0e2ed45596af4100bed3a8e5fd981685%7C0%7C0%7C638031056106003836%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&amp;sdata=LTtWB%2BCk2J1ofUWFQhAdNh0xH%2BBUADtK%2B5yR3TuU27I%3D&amp;reserved=0>)

2.10. Results: Based on what had been previously written (e.g., " Our predictions concern cross-country comparisons"), I was expecting cross-country comparisons (whether the results are consistent/inconsistent across countries).

3. Minor comments to the authors

3.1. Abstract: "Despite their significant impact, the effects of secondary stressors on psychological wellbeing in pandemics have not been thoroughly explored. Also, to our knowledge, no research has examined the psychosocial basis for their amelioration."

Instead of stating that no research had been conducted, it may be more valuable to highlight WHY it is important to consider secondary stressors.

Reviewer #2: The manuscript titled "Secondary stressors, stress, and resilience during a pandemic: The protective roles of social identity and social support" presents an empirically sound study, which is well-written. However, there are some concern points (the majority of them are minor) which I am presenting below.

1. You need to specify a pandemic in the title. There are a lot of pandemics. Thus, I recommend changing the tile into "Secondary stressors, stress, and resilience during the COVID-19 pandemic: The protective roles of social identity and social support".

2. Please sort keywords alphabetically.

3. Please do not use the abbreviations in the Highlights section. Moreover, please provide some examples of the studied secondary stressors in the first highlight point. In this way, your highlights will be more specific.

4. Page 2, a typo, two &: Vestergren & & COVIDiSTRESSII Collaboration, 2021).

5. A very very major concern. Your study is cross-sectional, thus, a casual language is not appropriate here. You need to check and change such words as "impact", "influence", "effect" and similar in the whole manuscript. Specially, reformulate some sentences related to your research questions and hypotheses.

6. Page 2. Please do not use the two closest brackets: "(Department of Health, 2009, p. 20) (e.g., direct exposure to the extreme event itself.............). Here and in other places in the manuscript.

7. Please use "First" before using the "second". See page 3; you have the "second", but you have no "first": "Accordingly, a focus on secondary stressors is paramount for several reasons. As Williams et al. (2021) emphasise, it expands our thinking on the effects of disasters beyond the narrower scope of mental health and its symptomatology, shifting it towards the structure of the social environments and how they contribute to the experience of trauma. Second, it accounts for both pre- and peri-disasters' personal, social, and structural conditions and considers how they interact with the event itself to exacerbate trauma".

8. There is no need to use group with a capital letter here: "Psychosocial sources of resilience: Groups, identity, and social support".

9. Please specify your independent and dependent variables (i.e., psychological outcomes) in your Figure 1. The figure shows what you study, but do it somewhat vague. For example, provide variables of psychological outcomes that you study, i.e. perceived stress, resilience. Make your model clearer for readers.

10. Page 5. "(H.)" in the title of Figure 1 is odd.

11. Measures. Page 6. Please provide examples of statements in scales and their each subscales. Please decipher NA and α (alpha Cronbach's). Please indicate "In all questionnaires, higher scores indicate higher levels of constructs being measured" or use similar constructions.

In my opinion, a scientific paper is a piece of art. Please, provide an excellent harmony in the description of the measures in your nice manuscript.

12. Page 6. The Perceived Stress Scale (PSS; Cohen, 1983) is incorrect. Please use the correct citation with Cohen et al., 1983 (the citation have 3 authors (Cohen, Kamarck, Mermelstein), but not 1 author as you wrote).

13. Page 6. Provide semicolon here instead of comma after BRS (BRS, Smith et al., 2008). Describe what the BRS measures as you did for other scales.

14. I did not find Chen (2008) in the references, but you use this citation (page 6). Please prepare your manuscript carefully before review and check all the references.

15. Please change achieved into supported (Given that scalar invariance was not achieved > Given that scalar invariance was not supported).

16. Page 8. PSS model seems to be so strange. Do you mean Perceived Stress Scale model? If yes, it seems incorrect. Rename this model or simply use "perceived stress model".

17. Page 12. Please write "post-traumatic stress disorder symptoms" instead of PTSD. In general, this is a major theoretical concern. Make sure that you use correct terminology. Mulchandani et al., (2019) did not study PTSD, but only symptoms of PTSD. In any case, PTSD should be deciphered, because you have no more abbreviations with PTSD.

18. Page 12. Long paragraphs are unwanted. Divide long paragraphs into smaller ones.

"Our study is one of the..." may be the first sentence of a new paragraph.

19. Women and men or females and males. Choose one form and use it logically in the whole manuscript. A mix form of women and males seems illogical. Check the whole manuscript (e.g., "women and low SES participants reported higher perceived stress and lower resilience than males and people with higher SES").

20. Page 13. Please provide a more specific conclusion or recommendation from the sentences which are started from "This suggests that women and lower SES groups experience higher perceived stress and lower resilience because they experience more stressors overall and not necessarily because they are more susceptible to stressors....".

21. In your current section "Limitations and directions for future research", there are no future directions, but only limitations. Please, add directions or rename the section. And in general divide limitations and future directions into two sections. Moreover, long paragraphs are undesirable.

22. Please add references for this sentence "The numbers of cases are still fluctuating, many students cannot attend school, large numbers of the workforce are ill, and many people suffer from the effects of long COVID".

23. The weakest part of the article is related to theory and practice of resilience. Authors believe that "If resilience is not an innate characteristic but depends on the material and psychosocial resources that people have access to, then....". In general, resilience in a relatively stable trait (see links below), however, it can be considered as a process. In your work, you use the BRS, which "is a reliable means of assessing resilience as the ability to bounce back or recover from stress" (Smith et al., 2008, p. 194). I believe that you need to describe this term in more detail in your introduction section, moreover, specify what the BRS measures. Thus, you need to conceptualize your studied variables and theoretical relations between them. See only some links presented below. In general, try to use some of the "strong", "relatively stable" (i.e., temperamental traits, cultural characteristics) in your future studies. If all variables in the study are considered as a "process" variables, the results of the study and its conclusions can be like "castles made of sand".

Kuldas, S., & Foody, M. (2021). Neither Resiliency-Trait nor Resilience-State: Transactional Resiliency/e. Youth & Society, 0(0). <https://eur01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fdoi.org%2F10.1177%2F0044118X211029309&amp;data=05%7C01%7Cevangelos.ntontis%40open.ac.uk%7C4f7d7b16428a40564e9a08dabddd7569%7C0e2ed45596af4100bed3a8e5fd981685%7C0%7C0%7C638031056106003836%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&amp;sdata=q4z0TzCY0WQf1IfS62CIiY02195rEC02FcRme%2FSeq6M%3D&amp;reserved=0>

Leys, C., Arnal, C., Wollast, R., Rolin, H., Kotsou, I., & Fossion, P. (2020). Perspectives on resilience: Personality Trait or Skill? European Journal of Trauma & Dissociation, 4(2), 100074. <https://eur01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fdoi.org%2Fhttps%3A%2F%2Fdoi.org%2F10.1016%2Fj.ejtd.2018.07.002&amp;data=05%7C01%7Cevangelos.ntontis%40open.ac.uk%7C4f7d7b16428a40564e9a08dabddd7569%7C0e2ed45596af4100bed3a8e5fd981685%7C0%7C0%7C638031056106003836%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&amp;sdata=I70t960yovaz2ptB9eh8c9nYqEYR6YuE4B5%2FBeQiOr8%3D&amp;reserved=0>

Smith, B.W., Dalen, J., Wiggins, K. et al. The brief resilience scale: Assessing the ability to bounce back. Int. J. Behav. Med. 15, 194-200 (2008). <https://eur01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fdoi.org%2F10.1080%2F10705500802222972&amp;data=05%7C01%7Cevangelos.ntontis%40open.ac.uk%7C4f7d7b16428a40564e9a08dabddd7569%7C0e2ed45596af4100bed3a8e5fd981685%7C0%7C0%7C638031056106003836%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&amp;sdata=awkMM0Uzgk03JjiYBBo0aOELc16e9nOdsA3H3PDgdHM%3D&amp;reserved=0>

24. About 30% of references used in the manuscript are self-citations. They are appropriate, but % of them is too high. Thus, add more references. My concerns are also related to theoretical aspects, thus, you will have a good opportunity to solve this problem of self-citations.

25. The reference list has some problems. You need to prepare it strictly according to the APA7 guidelines and journals requirements. This will facilitate editing process if the manuscript is accepted.

26. A very major concern. The results section is hard to read. I recommend presenting the mediation and moderation analyses in the form of tables, where you can indicate the statistical paths/ estimated effects etc.

27. Supplementary materials (SM):

(1) all abbreviations in SM should be described;

(2) all hypotheses and their titles (H1, H2, H3a etc.) in SM should be correspond with the hypotheses described in the manuscript (H.primary.stressors, etc). Please use your titles of hypotheses logically in all parts of your research;

(3) Present your results in SM in the form of table;

(4) number the countries in Table S1

(5) titles of measures in SM (i.e., Perceived Support Scale) do not correspond the titles of measures in the manuscript (i.e. The Expected Support Scale). Perceived Support Scale ≠ The Expected Support Scale.

(6) Some citations in SM are not presented in the reference list in SM. Please check and add missing references.

General discussion.

Dear Authors, your manuscript is very nice and I would like to see it published. I recommend revising the manuscript due to some theoretical and methodological problems (in particular, casual language, presenting the results). I kindly recommend you to address all my concern points carefully. I believe that I have done my best to provide you this review form.

28. "I forgot to write in the comments to the authors that there is need to provide N of females and N of males in the their study (this will be my 28th concenr point). This is a very important concern point, becuase they studied the role of gender. Please I would like to ask you to add this concern point to my comments when you send it to them. Thank you very much!"

Reviewer #3: This paper presents a large-scale (N = 14,600) cross-sectional study of the predictors of perceived stress during the COVID pandemic. The authors find that primary stressors (i.e. direct negative effects of major incidents) as well as secondary stressors (i.e. indirect negative effects of major incidents due to socio-political responses to the incidents) increase individual's perceived stress. Social identification moderates the relation between secondary stressors and perceived stress, and its effect on perceived stress is mediated via expected support. While demographic variables do not moderate the effect of secondary stressors on perceived stress, secondary stressors moderate the relation between demographic variables and perceived stress.

This manuscript presents psychologically interesting findings, is written in a concise manner, and addresses highly relevant questions for practice. Nevertheless, there are, in my view, a number of major issues that the authors need to address in order to develop the potential of their manuscript and findings (mainly concerning their overarching research question/model, the methods section, and the discussion of their results and limitations). In the following, I will comment on the section of this paper.

Title:

While the paper is written in a pointed manner, I think that the title might benefit from some more contextualization. Right now, it is mostly based on a concatenation of a number of words without revealing the underlying ideas. In order to make the title more attractive and correct, it could be useful to mention the study context of the Covid pandemic and to focus on what I assume is the core question of this paper: Which kind of environmental stressors in the Covid pandemic predict perceived stress, and is it possible to ameliorate this situation with social identity and support?

Abstract:

I would advise the authors not to report exploratory findings in the abstracts and concentrate on their pre-registered hypotheses. For example, it would be transparent to report the ns moderation.

Introduction:

In the introduction, the authors make it easy for readers to follow their train of thoughts, and they emphasize why this kind of research is important. They give a good overview of pre-existing literature, have a clear rationale and objective, and name a few examples that make their research lively. Moreover, the authors define all of their core concepts - with the exception of one crucial concept: their dependent variable. Until the end, it was very difficult to know what the authors mean by psychological wellbeing, and that it is operationalized by less perceived stress and more resilience.

In Figure 1, they speak of psychological outcomes. Sometimes, just "stress" is mentioned. I think that it is sound to interpret both as indicators of well-being, however, then readers would need to receive a better overview of what the authors mean, and the introduction should focus more on wellbeing (and mention the other terms less as they are viewed as part of wellbeing). I assume that it would already help to include in Figure 1 the words "Psychological wellbeing (less perceived stress, more resilience)" in the outcome box, so that it becomes clear to everyone.

Regarding Figure 1, I was distracted by the long hypotheses names and did not understand why the authors decided against the "conventional" way of speaking of Hypothesis 1-6. Importantly, I was wondering if it would be possible to combine their three models in one overarching model, and put the hypotheses exactly where the arrow is that tests them (including +/- to show the predicted direction of relationship). This idea also highlighted that there is no overall underlying theory behind this research. It is further reflected by the authors raising three research questions (that mirror their hypotheses) and not one main research question that could hold their paper together (see my suggestion above). I find it very rare to pose three research questions for such a short paper. I assume that the authors did not find a theory that would fit their questions. However, this makes it difficult to see the overall picture (and later also interpret and discuss their findings in a way that would be helpful for researchers from other fields). In sum, I would therefore suggest to present just one research question and generate one model in which all hypotheses are covered. For example, the hypothesis that secondary stressors predict psychological well-being OVER AND ABOVE primary stressors is currently not reflected in their depiction.

Page 2, 5th line from the bottom: I did not understand the part "2. Societal responses to the major incident or emergency", as of course, not every societal response could be interpreted as a stressor. Somehow, it seems as if the notion responses with negative impact is missing here.

Hypotheses:

The authors state their hypotheses very explicitly which makes it easy for readers to get an overview. Yet, it is difficult to make the link to the aforementioned literature review and the authors do not repeat their sources. Thus, for a reader from another field, it becomes difficult to evaluate the scientific basis of their hypotheses. Most importantly, the authors just very briefly discuss the issues of gender and SES which I think should be focused more. Why do they expect exactly these social categories to have an influence? Why did you choose these ones from a scientific point of view? What lies behind their assumption about gender and SES? I would suggest to either (1) use 1-sentence hypotheses and include their reasoning in the introduction above or (2) repeat the references of their reasoning when stating the hypotheses.

Method:

I think that currently, the method section lacks a lot of information that is necessary for an article in JEP. The authors refer to the COVIDiSTRESS survey, however they do not provide sample characteristics such as gender, age, education, countries, … in their own paper. As this manuscript needs to work as a stand-alone paper, the authors should include this necessary information. Moreover, the context of data collection remains in the shadows and in the discussion, the authors mention some things on the context that readers did not know before. I would thus suggest to expand their section on the context of data collection.

It is great that the authors pre-registered this study. I am just wondering: When they state "with additional analyses registered prior to data analysis", are there hypotheses that the authors did not include because they produced non-significant findings? If they did not include specific hypotheses and if these are not part of other research then, the authors should be explicit about it.

Finally, the authors describe that they cleaned and filtered the data, however their exclusion process and criteria are not truly explained. This information is highly relevant in order to make this research replicable.

Regarding measures, it is highly important to know the items that the authors base their concepts on in order to interpret the findings of this paper. I would recommend to include all items in the supplements and to state one exemplary item in the main text. It is important to mention that this lack of transparence also made it difficult for me to interpret the authors' findings.

It should be highlighted that well-being was conceptualized via two indicators (perceived stress and lack of resilience).

In the data analysis section, I did not understand why the authors used language group as an important multilevel group, and what the authors meant by "alignment method". They should explain this for readers.

Results:

The authors refer to their Supplementary Material a lot. However, supplementary material should not be necessary in order to understand and evaluate their paper. I would therefore suggest to make reference to supplements less prominent and put them into brackets.

In the results section, the authors make an effort to be very transparent and it is possible to follow their analyses. However, I would advise them to refrain from using abbreviations such as "M2" or "VIFs" in order not to lose readers from other sub-disciplines.

Regarding the specific topic of resilience, it would be helpful if the authors indicated the direction of an effect. Currently, they mostly speak of "primary stressors predicted resilience", however the direction is not disclosed. Additionally, it should state "more primary stressors were related to less resilience" or "primary stressors negatively predicted resilience". I must admit that this part confused me a lot as I was not sure if the authors found something in line with their hypothesis or not.

In the section "Association between secondary stressors and psychological outcomes" it is not clear if the authors indeed included both primary and secondary stressors in the same analysis (as stated in the introduction and discussion). This should be clarified.

Finally, the authors also present exploratory analyses that I find very interesting. However, in my opinion, the narrative rationale for it does not fit in the results section. I would propose to only report the statistical tests in the results section and move the reasoning into the discussion, in order to enrich the discussion part.

In order to interpret the data of this study, it would also be of high relevance to report a correlation table of main variables, and to present a table of their results rather than to have everything in a written form. This way, the main findings of this study would be more easy to grasp.

Discussion:

The discussion summarizes main results and repeats a lot of parts of the introduction. I would like to encourage the authors to go more into depth with their discussion. For example, would it be possible to link their results to a pre-existing psychological theory? (such as protection motivation theory) Under which conditions do the authors expect their results to be replicable and under which might an effect be diminished? Would their model work for every crisis? Moreover, how do the authors explain the non-significant moderation that only works "the other way around" - I find this especially interesting. What are the psychological mechanisms behind gender and SES that the authors expect to drive this effect? I also think that the authors have a valid point in stating that mental health should not be individualized but that a more structural approach is needed. How could this point be supported by the finding of their study? (also depending on how stressors were measured which I unfortunately do not know) Finally, the limitation section reads a little bit like a brainstorming with many points that do not go into detail. For example, the authors state that they cannot infer causality - but still infer it in a way that their ideas are based on previous research. Yet, if this previous research is also cross-sectional, I would be cautious with such an assumption and invite the authors to describe ways of actually testing their hypotheses causally. Moreover, I did not understand why it was important for the authors to address psychopathology. Also, the mentioning of "lack of space" was unclear. Moreover, the authors mention ideas on how war experience and the Covid pandemic interaction - would it not be possible to test this with their global dataset? Further, the authors state that education and employment are more difficult to interpret - why is that so? Did the authors indeed analyses them and not report them here? In my view, all these point need explication and clarification.

To sum it up, I think that this paper would benefit from integration into broader psychological theories and from a limitation section that already presents ideas on how to test their findings causally and in other settings.

Overall, I would like to congratulate the authors for this interesting study and I think that it is possible and worth addressing the raised issues in order to make this paper even more impactful.