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RESEARCH ARTICLE

REVISED **Single motherhood, social independence and non-communicable disease (NCD) outcomes among young females (15-24 years old) in South Africa [version 3; peer review: 2 approved with reservations]**

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Abstract

Background: Non-communicable diseases (NCDs) acquired during youth follow into and affect adulthood. The association between young mother's social independence and NCD status is of policy interest due to its effect on economic and social development. This study aimed to determine the causal relationship between social independence and NCD outcomes among young, single mothers in South Africa.

Methods: Data from the South African National Income Dynamics Survey (NIDS) in 2008 and 2017 was used to determine if single mothers developed hypertension, diabetes or asthma by various indicators of social independence, including highest level of education and employment status. The sample was initially made-up of unmarried females (15-24 years old) without any children in 2008. Both fertility and social independence was followed-up to 2017.

Results: In total, 66 young females developed an NCD by 2017 and 87% (n=57) of these women had a child in the interim period. Employment of young females increased from 4.78% in 2008 to 37.79% in 2017, but completion of secondary or tertiary education declined from 67.94% in 2008 to 56.01% in 2017. In addition, half (50.88%) of the young females were partially independent by 2017, with only 11.03% being fully independent at this time. Finally, logistic regression results showed that the likelihood of developing an NCD increased if young females with children were not socially independent.

Conclusions: The relationship between social independence and NCDs suggest that policies and programmes in South Africa need to incorporate socioeconomic status as a determinant of disease and in particular, need to address socioeconomic indicators as additive

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measures and not autonomous indicators.

Keywords

Non-communicable diseases, social independence, single mothers, South Africa, NIDS data, logistic regression

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The major concerns raised by the reviewers are here addressed. These are clarifications on the results and adding to the limitations that which the study could not address. More detailed response has been sent to the editors.

Any further responses from the reviewers can be found at the end of the article

Introduction

In recent years, the screening, diagnosis, treatment and maintenance of non-communicable diseases (NCDs) in developing countries has increased dramatically^{1–3}. However, the prevalence of diseases such as hypertension, diabetes, and obesity in African countries remains high at 5%, 46%, and 27%, respectively^{4,5}. Further, it is estimated that by 2030, deaths from NCDs are likely to increase globally by 17% and in Africa by 27%⁶. This is in addition to the high burden of disease and death in the region caused by communicable diseases such as HIV/AIDS, malaria and tuberculosis, which remain persistently high^{7–9}.

In South Africa, this double-burden of communicable and non-communicable disease is high with adult HIV and AIDS prevalence at 19% overall and 23% among females and 13% among males¹⁰. Furthermore, 12% of all adults (aged 15 years and older) have hypertension, 2.1% diabetes and 1.8% high cholesterol¹⁰. In addition to this, disease comorbidities are increasing, with one study finding that 26.9% of patients with tuberculosis had a second co-existent disease or comorbidity and 25.3% had more than one comorbidity or multi-morbidity¹¹. This complication of co-existing diseases makes treatment and management of disease costly, complicated and difficult in South Africa where social inequality is high. Research has found that poverty, service delivery challenges and gender imbalances contribute to disease and mortality in the country^{12,13}. One study found a strong correlation between higher levels of household poverty and a higher likelihood of being ill due to AIDS or being AIDS-unwell¹⁴. In fact, a number of comparative studies have shown that females in South Africa are more affected by social inequality than males^{15–17}.

Global literature has proven that females who are empowered and independent have better health outcomes than those who are not^{18–20}. Studies on education have shown that when girl children are educated they are in a better position to provide financially for themselves and their families^{21,22}. In a different study, it was found that females who are not victims of gender-based and intimate partner violence, are more likely to have control over their reproductive behaviour and can limit or space child births²³. Finally, studies have shown that when females are employed they develop decision-making authority within their households and this in turn positively impacts the health outcomes of their children^{24,25}.

Single motherhood in South Africa is fairly common with 43.1% of young children living with their mothers only²⁶. Despite social welfare and assistance²⁷ made available to single

mothers, many still live in poverty and are more likely to be economically insecure which is a combination of unemployment, contract or part-time employment, accessing a social grant from the state and earning below average income compared to unmarried young females without children^{28,29}. For young single mothers, it is a struggle to complete schooling, find employment and obtain financial support from fathers^{28,30,31}. Young women in general are also affected by NCDs with rates of hypertension (17%), diabetes (1%) and asthma (9.5%) being the highest among 15–24 year olds¹⁰. The purpose of this study is to better understand the relationship between social empowerment or independence and NCD outcomes among single mothers over time.

Methods

Study design and data source

Nationally representative longitudinal data from the [South African National Income Dynamics Survey \(NIDS\)](#) 2008 and 2017 are used for this study. The NIDS data is a panel survey funded by the Department of Planning, Monitoring and Evaluation (DPME), Government of South Africa. The NIDS is conducted by the Southern Africa Labour and Development Research Unit (SALDRU) at the University of Cape Town (UCT)^{32,33}. The study covers important contemporary issues, including poverty and well-being, household structure, fertility and mortality, migration, labour market participation, health, education, vulnerability and social capital among others³². Ethical approval was obtained by SALDRU to interview participants. The data made available to the author for analysis was completely anonymised.

Study population and sample

The study population for this longitudinal study, is females aged 15–24 years old in the first wave of the survey, 2008, who developed at least one non-communicable disease (NCD) by the latest wave of data in 2017. NIDS data are collected every two years, however the data between waves 1 and 5 are not used in this study because NCDs are lifestyle diseases and usually take time to develop. Therefore this study only examines the first and latest datasets. There were no other eligibility criteria. The total number of females aged 15–24 years old in 2008 was 2,467 (n). From this number, females with children (n= 891) were excluded and [Figure 1](#) shows how the sample was derived to include young females with no children, who were unmarried and did not have any NCDs in 2008 (n=1,528) and followed through to 2017. However, a further 426 participants were not followed up and so the overall 2017 sample of young females was 1,048. This was then separated into the females without children (n=213), those who married (n=12) and those of interest, who are females in 2017 who had given birth but remained unmarried (n=835). The Figure further shows the number and percentage of females who are socially dependent (Dep), with average social independence (partial) and are socially independent (Indep) by 2017.

Variable measurement

The outcome variable of this study is NCDs. Three NCDs were selected from the data based on highest prevalence in

Figure 1. Cohort follow-up. NCD=non-communicable disease; Dep=socially dependent; Indep=socially independent; Partial=average social independence.

2017 and are high blood pressure, diabetes and asthma. In 2017, respondents were asked if they had been diagnosed with each of these (and other) diseases to which they responded 'yes' or 'no'. By 2017, 42 (n) females had developed high blood pressure, 10 (n) developed diabetes and 16 (n) had asthma. Respondents with more than one of these diseases or comorbidities (n=2), were dropped from the analysis. A variable, 'NCD' was generated to reflect whether respondents had one of these diseases (yes) or not (no) and is used in the logistic regression analysis.

Social independence is an additive index variable which consists of the employment status (yes/no); highest level of education attained (less than secondary/ secondary or tertiary); and if the respondent was a main decision-maker in their household (yes/no) by 2017. This variable is classified as dependent, partially independent, or independent. Those not employed, with less than secondary education and not a main decision-maker are classified as dependent. Those with less than secondary education and either unemployed but are the main decision-maker, or are employed but not the main decision-maker are classified as partially independent; Those who are employed, have completed secondary or tertiary education

and are the main decision-makers in their households are classified as independent. The rationale for this classification is based on prior studies whereby education, employment and decision-making authority are among the characteristics used to measure a females independence from her partner, spouse and family as well as her autonomy³⁴⁻³⁶.

The control variables for this study are age of the respondent, race or population group using the South African Census classifications of African/Black, Coloured, White, Indian or Asian and Other; religious affiliation (Christian or none/other), and life satisfaction level. For the latter variable, respondents are asked to rate their level of life satisfaction from 1 (unsatisfied) to 10 (satisfied). For this study, respondents who rated their life satisfaction between 1 and 3 are 'unsatisfied'; 4 and 6 are 'average' and 7 to 10 are 'satisfied'.

Statistical analysis

Analyses were performed using Stata software version 14. Frequency and percentage distributions are used to describe the study population at baseline in 2008 and for the follow-up period in 2017. Logistic regression was used to identify the

relationship between social independence and NCDs among young single mothers in South Africa.

Results

Table 1 shows the characteristics of the sample carried forward from 2008 to 2017. The table shows the characteristics of the female respondents in 2008. Some of the characteristics in the table are non-modifiable including population group and religious affiliation. Other characteristics, age, level of education and life satisfaction are measured here at baseline to present the profile of females in the study at the start of the study. Almost 67% of all female respondents were 15–19 years old in 2008 and 84.49% were African. Further, 11.47% of the respondents were Coloured and 20.66% were not in school at the time, while 66.10% were in secondary school. By level of life satisfaction, 37.21% were averagely satisfied and 34.49% were satisfied. Finally, by religious affiliation, 86.91% of the sample was Christian.

Table 1. Percentage distribution of demographic characteristics among young females, 2008.

Respondent Characteristics	Frequency	Percentage
Total	1,360*	100
Age Group in 2008		
15–19	907	66.69
20–24	453	33.31
Population Group		
African	1,149	84.49
Coloured	156	11.47
Asian/Indian	22	1.62
White	33	2.43
Level in School		
Not in school	281	20.66
Primary	155	11.4
Secondary	899	66.1
Tertiary	25	1.84
Level of Life Satisfaction		
Unsatisfied	385	28.31
Average	506	37.21
Satisfied	469	34.49
Religious Affiliation		
None/Other	178	13.09
Christian	1,182	86.91

*This total excludes the 12 young females who married in 2017

Table 2 shows the temporal change in various social independence measures from 2008 and 2017. Unemployment went down from 95.22% of the sample in 2008 to 62.21% in 2017. The percentage of females with secondary or tertiary education declined from 67.94% in 2008 to 56.01% in 2017. Finally, the percentage of young females who became main decision makers in their households increased from 4.63% in 2008 to 34.34% in 2017.

Figure 2 shows the percentage distribution of the social independence composite measure in 2008 and 2017. The graph shows that the percentage of dependent females increased from 27.5% in 2008 to 38.09% in 2017. Similarly, the percentage of independent females increased from 4.71% in 2008 to 11.03% in 2017. While the partial social independence decreased from 67.79% in 2008 to 50.88% in 2017.

Figure 3 shows the percentage distribution of specific non-communicable diseases by childbearing status (given birth) of respondents in 2017. The figure shows that among the females with high blood pressure 90.48% had given birth and 9.52% had not had a child between 2008 and 2017. For diabetes, 80% had given birth and among those females who developed asthma, 81.25% had given birth too.

Table 3 shows the results of two logistic regression models measuring the likelihood of the outcome of NCD development (at least one of the three) by the characteristics of single mothers in 2008 (Wave 1) and 2017 (Wave 5). Using Wave 1 characteristics, single mothers were less likely to develop an NCD by Wave 5 if their life satisfaction was above unsatisfactory (OR=0.75; 95% CI: 0.021842-0.868864), with unsatisfactory as the reference category (RC). Similarly, young mothers with average social independence (OR=0.68; 95% CI: 0.031213-0.842437) and were socially independent

Table 2. Percentages of social independence over time, 2008 and 2017.

Social Independence Measure	2008	2017
	n= 1,360	n= 1,048
Employment Status		
Unemployed	95.22*	62.21*
Employed	4.78*	37.79*
Completed School Level		
< Secondary	32.06*	43.99*
Secondary or Tertiary	67.94*	56.01*
Main Decision Maker		
No	95.37*	65.66*
Yes	4.63*	34.34*

*p-value<0.05

Figure 2. Percentage distribution of social independence in 2008 and 2017.

Figure 3. Description of the study sample at Wave 5 by childbearing status, 2017.

Table 3. Odds of non-communicable disease (NCD) development among single mothers in 2008 (Wave 1) and 2017 (Wave 5).

Respondent's characteristics	Odds Ratio	P-Value	[95% Conf.	Interval]
Wave 1				
Age group	1.04	0.894	0.566791	1.917333
Population Group	1.73	0.058	1.714914	2.110144
Religion	1.41	0.479	0.544734	3.648989
Life Satisfaction	0.75	0.041	0.021842	0.868864
Average social independence	0.68	0.032	0.031213	0.842437
Social independence	0.40	0.038	0.031841	0.145547
Wave 5				
Age group	1.01	0.886	0.897128	1.133999
Population Group	1.41	0.033	0.031753	1.837768
Religion	1.52	0.389	0.588163	3.914249
Life Satisfaction	1.40	0.045	0.043053	1.0860217
Average social independence	1.46	0.032	0.026927	1.842006
Social independence	0.90	0.037	0.029152	1.047172

(OR=0.038; 95% CI: 0.031841-0.045547) in Wave 1, were also less likely to develop at least one NCD compared to those who are socially dependent (RC). Using the Wave 5 characteristics of young mothers, non-African/Black (RC is all other racial groups combined) mothers were more likely to develop an NCD with an odds ratio of 1.41 (95% CI: 0.031753-1.837768). Similarly the odds of NCD development increases with life satisfaction (OR=1.40; 95% CI: 0.043053-1.860217) and average social independence (OR= 1.46; 95% CI: 0.026927-1.842006), however the odds are lower if the young mothers are socially independent (OR=0.90; 95% CI: 0.029152-1.047172).

Discussion

Young mothers face a number of social and economic challenges. For this reason, efforts to ensure the optimal health of young mothers are important. The main reason this study was done was to address the factors associated with non-communicable disease among young mothers with the aim of generating purposeful prevention. The study makes a contribution through the identification of the role of social independence on disease development among young, unmarried mothers in South Africa.

The study has identified a relationship between social independence and NCDs among young unmarried mothers in South Africa. At baseline, many of the young women were unemployed, had primary education only and were not main-decision makers in their households. While these indicators with time and more young females gained employment, secondary or tertiary education and became decision-makers, they also became first-time mothers. In addition, using the additive variable to measure overall independence, a large proportion of these young women remain socially dependent despite having become mothers. This is a common situation in African countries, with research showing that young, unmarried mothers are dependent on their households, families and the government for the welfare and assistance with children³⁷⁻³⁹. In this study, it has been found that in addition to being socially dependent or partially dependent, young unmarried mothers are more likely to develop an NCD. Some of the NCDs addressed in this study are diabetes and hypertension. These diseases are also associated with the pre- and perinatal period, and could have been developed as a result of the pregnancy^{40,41}. With a chronic disease, young mothers are therefore less independent and rely on families and communities not only for the care of young children but also for assistance with the management of their conditions. It has been noted, that one of the main reasons patients with hypertension fail to manage their condition is due to a lack of adherence to treatment which includes taking medication and routine visits to the doctor⁴². For young people, assistance in adherence, including payment for the costs of treatment, often comes from family members⁴². In another study, it was also found that strong family support was positively associated with blood pressure control among hypertensive patients⁴³.

In addition to social independence, this study has found a relationship between life satisfaction and NCDs among young,

unmarried mothers in the county. The results show that young mothers who are less satisfied with their lives overall, are more likely to develop an NCD. This is consistent with literature that shows young people in general who are not satisfied with their lives are less likely to take care of their physical and mental health⁴⁴⁻⁴⁶. More specifically, young people who are more satisfied with their lives, are less likely to smoke cigarettes and more likely use sun protection, eat well and engage in physical exercise⁴⁴. However, the reverse relationship has also been found, in particular, with reference to mental health impacting on life satisfaction among youth. These studies have found that youth who have experienced trauma, anxiety and depression, among others, are less likely to report being satisfied with their lives in the absence of any clinical or social interventions to address their mental health⁴⁷⁻⁴⁹. Of importance to this study, is the existing research which shows that education, employment, and support from fathers of their children are important indicators of happiness and life satisfaction among young mothers⁵⁰⁻⁵².

The study is subject to a few limitations. First, the issue of comorbidities, or more than one NCD, is not addressed. Respondents with more than one NCD were dropped from the analysis because of the sequential nature of the development of comorbidities. There is, however, a bias in dropping those with more than one NCD, but there were only two cases in the study and so the consequences have been minimal. Second the measure of social independence is made-up of only three measures: education, employment, and decision-making authority. There are many other measures that could be added to this variable but were not included because of non-response. The addition of these variables would have decreased the sample size and as it is, the sample for this study is fairly small. In addition to this, the data does not have any indicators of healthcare access or utilization as well as other modifiable risk factors such as alcohol misuse, sedentary behaviours and unhealthy diets. These variables would have been ideal to analyse and add to the social independence measure of the study. Finally, NCDs were grouped in this analysis and not treated as individual disease outcomes. Due to the limited numbers of reporting of individual diseases it was best to group the outcomes. However, future research which analyses each individual disease will contribute to targeted policy and programme interventions.

An added strength of the current study is the use of the additive measure for social independence. As opposed to treating education, employment and decision-making authority as autonomous characteristics, this measure takes into account the strength of having all three as a measure of independence. Preliminary analysis, not included in the final study, showed no relationship between these autonomous measures and NCDs. Therefore, the additive measure is more useful.

A second strength of the study is the minimal loss to follow-up of the NIDS data. With only a few young females not being followed-up the strength and completeness of the data make the results reliable and plausible.

In conclusion, to reduce the likelihood of NCDs among young unmarried mothers, efforts to increase social independence need to be made. Results from this study show that the combined, additive measure of education, employment and decision-making authority, is important to reduce the likelihood of NCDs. Therefore, policies and programmes that autonomously address education and employment, need to bear in mind that these goals work together with decision-making authority to enable independence among young females. Also, healthcare policies and programmes that aim to reduce the incidence of NCDs among young people, should be aware of the social determinants of disease outcomes and not only focus on biomedical causes. Further research which examines the more indicators of independence such as household ownership and access to healthcare should be added to the social independence measure for a more holistic view of independence and its relationship to disease development among young people in developing countries.

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Data availability

The researcher did not collect the data, nor does she own the data. The data from the National Income Dynamics Study (NIDS) as well as the survey materials are freely available by request from the Southern Africa Labour and Development Research Unit (SALDRU) at the University of Cape Town (UCT), South Africa. The request for data download can be found at <http://www.nids.uct.ac.za/>.

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Open Peer Review

Current Peer Review Status: ? ?

Version 3

Reviewer Report 13 June 2022

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Olusesan Ayodeji Makinde

Viable Knowledge Masters, Abuja, Nigeria

Thanks for the effort and updates you have made to this work.

The explanation to my initial comments are clear. I have seen some changes between the initial version submitted and the latest document. However, some of the issues identified on Table 3 persist in this version. For example, the OR for social independence in Wave 1 is outside of the range of the 95% CI. This is similar for life satisfaction for Wave 5 (1.086 in table but reported as 1.86 in the narrative). Several others are also skewed and do not fall in the middle of the 95% CI which calls the analysis and conclusions reached to question. For example, the population group in Wave 1 is skewed to the lower confidence interval and the social independence (OR=0.90; 95%CI: 0.029152-1.047172) is skewed towards the upper limit.

Asides these irregularities, the method of comparing the Wave 1 and Wave 5 findings are not clear. One would expect that the Wave 5 and Wave 1 would be compared against one another to show how changes in lifestyle and other parameters over time (between waves 1 and 5) influenced the outcome. However, it seems each Wave was analysed independently and then the mode of comparison was just by eyeballing the statistics across the two analysis. More information is certainly needed on how this comparison was done as it is not clear in the methodology.

The importance of Table 3 to the entire manuscript cannot be overemphasized. Thus, it requires further review before the paper can be satisfactory.

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Epidemiology, Health Information Systems, Non-communicable diseases

I confirm that I have read this submission and believe that I have an appropriate level of

expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Version 2

Reviewer Report 03 February 2022

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Prashanth N Srinivas

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Yogish C B

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Thank you for inviting us for “Single motherhood, social independence and non-communicable disease (NCD) outcomes among young females” article review. The author examines the relationship between social empowerment/independence and Hypertension, Diabetes, and Asthma outcomes among single mothers from a panel survey data set collected by South African National Income Dynamics Survey. The authors use logistic regression to identify the relationship.

There are still a few major shortcomings in the paper. We have outlined these below:

1. The description of the panel surveys or at least citations to sources where comprehensive description of the panel survey methodology, underlying data etc. is unavailable. This is important for readers of the paper. For example, citation 32 refers to wave 1 methodology, other wave details are not available.
2. While describing table 3, the authors mention that they chose wave one (2008) and wave five (2017) data. The reasons underlying choice of these two waves only and why any other/all other wave data was not used for analysis are unavailable.
3. The assertions related to validity of findings to the entire conditions of Non communicable diseases is not tenable, as the authors considered Hypertension, Diabetes, and Asthma for analysis. The authors will have to define the definitions that are applicable to this paper and sharpening the assertions.
4. Table 1 provides demographic characteristics of female respondents in wave 1 (2008), some of which are non-modifiable and may not have changed, whereas others are indeed modifiable characteristics such as level of life satisfaction. There is no information on whether such changes were assessed or not and how this change may have affected their analysis.

5. In table 3, logistic regression findings are presented but it is difficult to interpret the result without clarifying on which is the reference group for the odds ratios. Please provide further clarity on the logistic regression in methods including for example adjusting for dependent variables or not.
6. Age, gender, and family history are non-modifiable risk factors, while tobacco use, physical inactivity, the harmful use of alcohol and unhealthy diets are modifiable risk factors of non-communicable diseases. Many of these core NCD risk factors appear to not be included in the analysis. What could be the effects of their non-inclusion (if any)?
7. The discussion section needs to be sharpened to discuss the findings of this study only.
8. A clarification is needed: As per Jennifer Manne-Goehler median prevalence of diabetes was 5% (range 2–14), in article it was quoted as 46%.

Is the work clearly and accurately presented and does it cite the current literature?

Partly

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Partly

If applicable, is the statistical analysis and its interpretation appropriate?

Partly

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Health inequalities, social determinants of health and non-communicable diseases (expertise of both reviewers included)

We confirm that we have read this submission and believe that we have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however we have significant reservations, as outlined above.

Author Response 24 Feb 2022

Nicole De Wet-Billings, University of the Witwatersrand, Johannesburg, South Africa

There are still a few major shortcomings in the paper. We have outlined these below:

Comment 1.1: The description of the panel surveys or at least citations to sources where comprehensive description of the panel survey methodology, underlying data etc. is unavailable. This is important for readers of the paper. For example, citation 32 refers to wave 1 methodology, other wave details are not available.

Response 1.1: I have added another reference to the Wave 5 methodology on page 3, reference number 33, which is Ingle, K., Brophy, T., & Daniels, R. (2021). Panel User Manual NIDS CRAM Wave 5. Retrieved from Cape Town

Comment 1.2: While describing table 3, the authors mention that they chose wave one (2008) and wave five (2017) data. The reasons underlying choice of these two waves only and why any other/all other wave data was not used for analysis are unavailable.

Response 1.2: An explanation for why only two waves of data was included under the study population section on page 3 and reads: "NIDS data are collected every two years, however the data between waves 1 and 5 are not used in this study because NCDs are lifestyle diseases and usually take time to develop. Therefore this study only examines the first and latest datasets".

Comment 1.3: The assertions related to validity of findings to the entire conditions of Non communicable diseases is not tenable, as the authors considered Hypertension, Diabetes, and Asthma for analysis. The authors will have to define the definitions that are applicable to this paper and sharpening the assertions.

Response 1.3: This is a limitation of the study and has been added to this section on page 10 which reads: "Finally, NCDs were grouped in this analysis and not treated as individual disease outcomes. Due to the limited numbers of reporting of individual diseases it was best to group the outcomes. However, future research which analyses each individual disease will contribute to targeted policy and programme interventions".

Comment 1.4: Table 1 provides demographic characteristics of female respondents in wave 1 (2008), some of which are non-modifiable and may not have changed, whereas others are indeed modifiable characteristics such as level of life satisfaction. There is no information on whether such changes were assessed or not and how this change may have affected their analysis.

Response 1.4: This has been explained under the results for Table 1 on page 5 which reads: "Some of the characteristics in the table are non-modifiable including population group and religious affiliation. Other characteristics, age, level of education and life satisfaction are measured here at baseline to present the profile of females in the study at the start of the study".

Comment 1.5: In table 3, logistic regression findings are presented but it is difficult to

interpret the result without clarifying on which is the reference group for the odds ratios. Please provide further clarity on the logistic regression in methods including for example adjusting for dependent variables or not.

Response 1.5: The reference groups have been added to the write up for Table 3 on page 7, throughout the paragraph.

Comment 1.6: Age, gender, and family history are non-modifiable risk factors, while tobacco use, physical inactivity, the harmful use of alcohol and unhealthy diets are modifiable risk factors of non-communicable diseases. Many of these core NCD risk factors appear to not be included in the analysis. What could be the effects of their non-inclusion (if any)?

Response 1.6: This too is a limitation which has been added to the section on page 10, which reads:

"In addition to this, the data does not have any indicators of healthcare access or utilization as well as other modifiable risk factors such as alcohol misuse, sedentary behaviours and unhealthy diets. These variables would have been ideal to analyse and add to the social independence measure of the study".

Comment 1.7: The discussion section needs to be sharpened to discuss the findings of this study only.

Response 1.7: This section has been thoroughly reviewed and amended to ensure that only findings of the study have been discussed.

Comment 1.8: A clarification is needed: As per Jennifer Manne-Goehler median prevalence of diabetes was 5% (range 2–14), in article it was quoted as 46%.

Response 1.8: This reference is not referring to the 46% prevalence. There is a second reference to this sentences which is referring to the 46% statistic used in the paragraph.

Competing Interests: none

Version 1

Reviewer Report 26 July 2021

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Olusesan Ayodeji Makinde

Viable Knowledge Masters, Abuja, Nigeria

The research on single motherhood, social independence and non-communicable disease outcomes among young females in South Africa provides a new dimension in NCD research in single mothers. It attempts to link social independence and NCDs among a cohort of young women who were followed longitudinally across 10 years. It has great value due to the low loss to follow up amongst the starting cohort. It is certainly an innovative perspective to the research and can be useful as an advocacy tool for future policy and programming.

I however, identified some shortcomings in the paper that need further attention before moving forward. The paper, despite being a longitudinal study, does not provide evidence of causal analysis which is part of the objectives initially identified. Yes, there might be an association but causal inference is not obvious. It might be necessary to give some statements on this or to edit out the statement on causal relationship.

In addition, the regression analysis in table 3 has several shortcomings. The Odds Ratio presented is outside the range of the 95% confidence interval in several situations like life satisfaction, average social independence, social independence and others. This is a major shortcoming of this paper as a change in value after an update to the analysis might change the direction of discussion.

Although you assert that the 2 cases of co-morbidity you dropped is a small number, I think it is significant since the number that developed diabetes was only 10. This makes it 20% of the number you found. If there can be room for their inclusion, you might consider. However, if you feel strongly on need for their exclusion, that is also fine.

Minor grammatical issues on page 5: 'NCD with an odds ration of 1.41' and not 'NCD with and odds ration of 1.41'. Also on page 7: An added strength of the current study is the use of' instead of 'used of'.

Is the work clearly and accurately presented and does it cite the current literature?

Partly

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

If applicable, is the statistical analysis and its interpretation appropriate?

Partly

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Epidemiology, Health Information Systems, Disease Registries, NCDs, Gender

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 25 Feb 2022

Nicole De Wet-Billings, University of the Witwatersrand, Johannesburg, South Africa

Single motherhood, social independence and non-communicable disease (NCD) outcomes among young females (15-24 years old) in South Africa

Reviewer 1 comments and responses:

The research on single motherhood, social independence and non-communicable disease outcomes among young females in South Africa provides a new dimension in NCD research in single mothers. It attempts to link social independence and NCDs among a cohort of young women who were followed longitudinally across 10 years. It has great value due to the low loss to follow up amongst the starting cohort. It is certainly an innovative perspective to the research and can be useful as an advocacy tool for future policy and programming.

Comment 1.1: I however, identified some shortcomings in the paper that need further attention before moving forward. The paper, despite being a longitudinal study, does not provide evidence of causal analysis which is part of the objectives initially identified. Yes, there might be an association but causal inference is not obvious. It might be necessary to give some statements on this or to edit out the statement on causal relationship.

Response 1.1: All references to a causal relationship have been removed from the paper.

Comment 1.2: In addition, the regression analysis in table 3 has several shortcomings. The Odds Ratio presented is outside the range of the 95% confidence interval in several situations like life satisfaction, average social independence, social independence and others. This is a major shortcoming of this paper as a change in value after an update to the analysis might change the direction of discussion.

Response 1.2: The results have been removed and the write-up has been edited to ensure that no statistically insignificant results are inaccurately presented.

Comment 1.3: Although you assert that the 2 cases of co-morbidity you dropped is a small number, I think it is significant since the number that developed diabetes was only 10. This makes it 20% of the number you found. If there can be room for their inclusion, you might consider. However, if you feel strongly on need for their exclusion, that is also fine.

Response 1.3: I appreciate this suggestion as it does make sense. However, I kept the exclusion of these variables as the diseases are extremely rare and therefore, would have more specific risk factors. So, I ultimately decided to keep the diseases that are more common in the population.

Comment 1.4: Minor grammatical issues on page 5: 'NCD with an odds ration of 1.41' and not 'NCD with and odds ration of 1.41'. Also on page 7: An added strength of the current study is the use of' instead of 'used of'.

Response: 1.4: This grammatical error and others have been corrected throughout the paper.

Competing Interests: none