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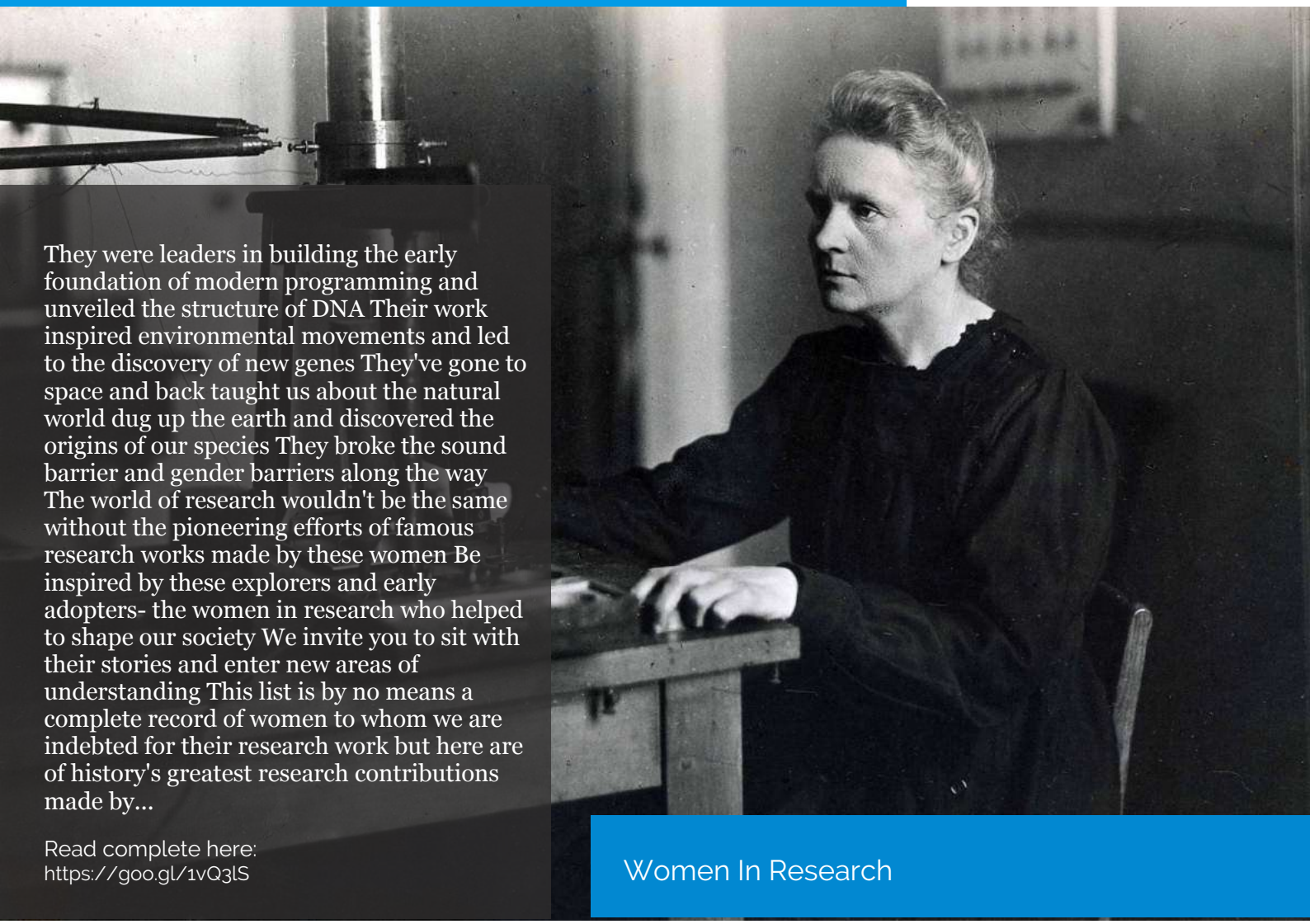

They were leaders in building the early foundation of modern programming and unveiled the structure of DNA Their work inspired environmental movements and led to the discovery of new genes They've gone to space and back taught us about the natural world dug up the earth and discovered the origins of our species They broke the sound barrier and gender barriers along the way The world of research wouldn't be the same without the pioneering efforts of famous research works made by these women Be inspired by these explorers and early adopters- the women in research who helped to shape our society We invite you to sit with their stories and enter new areas of understanding This list is by no means a complete record of women to whom we are indebted for their research work but here are of history's greatest research contributions made by...

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Sensitivity of Educational, Maternal, and Mental Health Outcomes from Income Redistribution Fluctuations in South African Children

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ABSTRACT

Introduction: This study utilizes a 2SLS model to quantify the sensitivity of education outcome (academic failure), mental health outcome (depression), and maternal health outcome (teenage pregnancy) from income redistribution fluctuations recorded in 2006, 2009, 2011, and 2015 in South African disadvantage children attending primary and secondary education.

Methods: Using the General Household Survey data for South Africa, the author examines these sensitivities among 93438 children aged 7–18 across the four waves.

Keywords: income redistribution, education outcomes, mental health outcomes, maternal health.

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Sensitivity of Educational, Maternal, and Mental Health Outcomes from Income Redistribution Fluctuations in South African Children

Cyprian M. Mostert

ABSTRACT

Introduction: This study utilizes a 2SLS model to quantify the sensitivity of education outcome (academic failure), mental health outcome (depression), and maternal health outcome (teenage pregnancy) from income redistribution fluctuations recorded in 2006, 2009, 2011, and 2015 in South African disadvantage children attending primary and secondary education.

Methods: Using the General Household Survey data for South Africa, the author examines these sensitivities among 93438 children aged 7–18 across the four waves.

Results: The model shows that income redistribution averts depression by 36 % and 15% during the period of high-income redistribution in the primary and secondary school cohorts, respectively. Income redistribution averts academic failure by 44 % and 23 % during the period of high redistribution in primary and secondary school cohorts. Income redistribution also averts teenage pregnancy by 7 % during the period of high-income redistribution. Low redistribution periods are characterised by meek improvements in education, mental, and maternal health outcomes.

Conclusion: The author concluded that the intensity of income redistribution plays a crucial role in improving education outcomes, mental health outcomes, and maternal health outcomes of disadvantaged children.

Keywords: income redistribution, education outcomes, mental health outcomes, maternal health.

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I. INTRODUCTION

There is an on-going debate about the impact of income inequality on children's health. Some authors argue that income inequality is associated with worsening mental health outcomes of children (Vilhjalmsdottir et al., 2016). Meaning, income redistribution can improve the mental health outcomes of children and induce pro-social behavior (Bandy & Ottoni-Wilhelm, 2012).

However, other authors argued that income redistribution is insufficient to improve the health outcomes of disadvantaged communities (Starfield & Birn, 2007).

For example, recently, it was reported that income redistribution could even worsen health outcomes of low-income individuals (Morar et al., 2021).

However, others reject this view and argue that increasing income inequality is bad for health (Bor et al., 2017), meaning income redistribution is good for society even though it has not received much support in recent times (Jackson & Payne, 2021).

Some authors claim that worsening income inequality is also linked to poor educational outcomes of children (Abdelbaki, 2012; Nordstrum, 2006). Other authors argue that income inequality worsens adolescent health, spilling over to education - causing high school dropout (Sznitman, Reisel& Khurana, 2017).

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Therefore, income redistribution has been suggested as a vehicle to support economic inclusion (Reindl & Tyran, 2021).

Some papers argued that parent income positively impacts children's education outcomes (Chevalier et al., 2013). Therefore, income redistribution is expected to advance children's education outcomes, assuming the education system prioritizes early childhood education (Neuman & Powers, 2021). Other authors reject this view and argue that household income and financial resources are associated with early school dropouts (Alcaraz, 2020). Therefore, the idea that income redistribution advances children's education outcomes may not be accurate.

These inconsistencies necessitate more international studies investigating the intersection between income redistribution, education outcome, and mental health outcome - especially in developing countries in light of the increasing cases of poor mental health in the adolescent population (Twenge et al., 2021).

1.1 Income redistribution in South Africa

In 2019, the South African government published the assessment report of income redistribution between the haves and have not (StatSA, 2019).

According to the report, income redistribution has improved during 2006, 2009, 2011, and 2015 where data samples were collected. It remains to be seen how the improvement of income redistribution advances educational, maternal, and mental health outcomes concurrently. This paper is designed to fill this gap and analyze the sensitivity of South African children's educational, maternal and mental health outcomes from income redistribution fluctuations.

So far, South Africa has utilized the social security system to advance income redistribution (Satumba, Bayat, & Mohamed, 2017). Other papers show that social grants in South Africa advance the ability to read, write, and attend school (Mostert & Vall, 2020). However, it is unknown if the accumulative income from redistribution programs improves children's academic failure in primary and secondary learning phases.

Another angle that remains open for investigation is how sensitive academic failure is from income redistribution fluctuations. Meaning, do high-income redistributions yield a better reduction in academic failure than low-income redistributions. One would expect that high-income redistribution will significantly avert academic failure, considering that parent income impacts children's education positively (Chevalier et al., 2013). This angle of literature remains unknown in South Africa.

Another question worth exploring is whether high-income redistribution begets more consi derable improvement in mental health outcomes (depression) in both girls and boys comparatively.

The mental health of the adolescent population has not been studied comprehensively in South Africa (Buckley et al., 2020 and Somefun & Fotso, 2020) despite its influence on education outcomes (Andersen, Holm, & Cote, 2021).

Nevertheless, one would expect that income redistribution to improve depression levels of disadvantaged children.

Another question worth exploring is how income redistribution affects the maternal health of children (teenage pregnancy). Currently, it is documented that poverty causes teenage pregnancy, forcing girls to drop out of school (Jochim, Cluver, & Meinck, 2021). Therefore, if one accepts this proposition, income redistribution should avert teenage pregnancy and poverty, thus improving education outcomes. Once again, this intersection remains unknown in South Africa.

1.2 Evolution of income redistribution in South Africa

According to Statistics, South Africa income redistribution improved with the share of income owned by the poorest 40 percent of the population increasing from 7.8 percent in 2006 to 9.3 percent in 2015 (StatSA, 2017) (See Figure 1).

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Such improvement was credited to the Republic of South Africa Constitution, which states that all citizens have the right to appropriate social assistance from the government if they cannot provide for themselves.

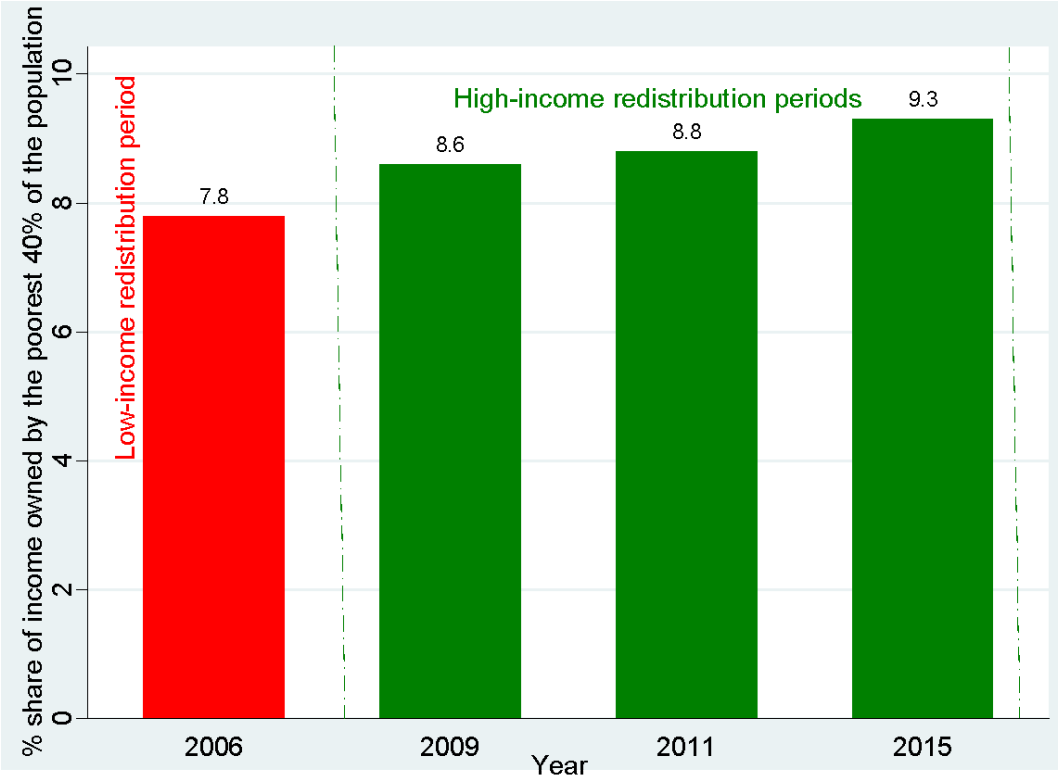

Figure 1: Evolution of income redistribution in South Africa

South Africa has utilized the seven social protection grants to advance income redistribution, which assisted the disadvantaged communities with household necessities (Maitra & Ray, 2003). Given the improved income redistribution from 2006, 2009, 2011, and 2015- the current study seeks to analyse the sensitivity of educational, maternal, and mental health outcomes arising from income redistribution fluctuations of these periods.

The current study seeks to answer the following questions: (1) What impacts do income redistributions exert on children's mental health outcomes (depression) in both low and high-income redistribution periods? (2) What impacts do income redistributions exert on children's education outcome (failure rate) in both low and high-income redistribution periods? (3) What impacts do income redistributions exert on a maternal health outcome (teenage pregnancy) in both low and high-income redistribution periods? (4) Are there any gender-based differences in the impact of income redistributions? This study is designed to answer these interrelated questions and unlock the role of income redistribution in fostering educational, maternal, and mental health outcomes in South African disadvantaged communities.

II. MATERIALS AND METHODS

The author uses a recently released database, the General Household Survey (GHS), provided by Statistic South Africa during 2006, 2009, 2011, and 2015. The GHS is an annual survey of approximately 120,000 individuals from more than 20,000 households. These yearly surveys aim to provide information on any changing trends in the composition of South African families. The GHS sampling procedure involves explicit stratification by province and urban and non-urban areas within each province. Household units are drawn under this stratification. For each household unit, individual characteristics are presented, including age, gender, educational

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outcomes, household income levels, health outcomes, and other general socioeconomic status variables.

The GHS structure questions for a binary response. For example, senior individuals in the household are asked if members of the household suffer from depression. The general reply is either yes, the member has episodes of depression, or no the member has normal moods without depression. The author uses these binary variables to quantify the changes in mental health outcome (depression), educational outcome (academic failure), and maternal health outcomes (teenage pregnancy) during low-income redistribution periods (the year 2006) versus high-income redistribution periods (the year 2009, 2011, 2015) as depicted in Figure 1. The author selected these year periods in line with the inequality report published by Statistic South Africa in 2019 (StatSA, 2019).

For quality purposes, all Statistic South Africa datasets are reviewed at regular intervals by the Statistician-General and the head of the relevant organ of state to ensure that they remain relevant and of specified quality. Therefore, the current binary variables reflect the genuine legal reality of the South African social outcomes, which are worth to be used for international scholarship.

The author utilized these cross-sectional datasets to understand the sensitivity of educational, maternal, and mental health outcomes from income redistribution fluctuations. The outcomes analysed are all dummy variables reported by the head of the household when asked about the education and health outcomes of primary school cohorts (age 7-13 years) and secondary school cohorts (age 14-18 years).

The GHS also includes information on households benefiting from the social security system.

However, the author did not want to compare households benefiting from social security to those not benefitting. These two groups of households can be different in many additional dimensions (for example, income, education background, or information barriers), which can influence the exogenous aspect of the model and inflate the possible outcomes. The author did not use an Ordinary Least Squared Model (OLS) for these reasons. Instead, the author opted for a Two-stage Least Squared Model (2SLS) – similar to the analysis done previously in South Africa (Mostert, 2020 & 2021). In this analysis, the author instrument income redistribution with the cohorts as presented below.

$$Y_i^a = \alpha_1 + \beta_1 \sim Income - red_i \partial + \psi RaceFE + \xi \Pr ovinceFE + \delta Age + \wp MotherEducationFE + \square FatherEducationFE + \sigma Female_i$$

$$Income - red_i^a = \alpha_2 + \beta_2 Treat_i^a + \psi RaceFE + \xi \Pr ovinceFE + \delta Age + \wp MotherEducationFE + \square FatherEducationFE + \sigma Female_i$$

In the first equation, Y is one of the outcomes for individual $_i$ at age α (7-13 year cohort or 14-18 year cohort), and "~ Income-red" is the predicted benefit from income redistribution. The regression includes race fixed effects (which capture the different racial groups in South Africa), province fixed effects (including nine provinces in South Africa), age fixed effects (which capture age differences for primary and secondary cohorts), and a dummy for females (for the regressions where the author estimates the effects for both males and females). Furthermore, the author also includes controls (fixed effects) for the parent's educational level, which may influence education outcomes (Alcaraz, 2020).

In the second equation (which corresponds to the first stage regression of the 2SLS), income redistribution is estimated as a function of the treatment dummy variable, which identifies the cohorts whose parents held any government social security grants and were satisfied with social welfare services. This group of cohorts was classified as the treatment group for income redistribution. Cohorts whose parents did not benefit from any social security grant and were dissatisfied with the social welfare services did not benefit from income redistribution, thus considered the control group. The author opted to analyse these cohorts in households earning less than US $ 500 per month. In South Africa, a

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significant share of disadvantaged households still does not benefit from the social security system, despite suffering from poverty. The most common causes for failure to qualify for social grants are lack of identity documents, fraud, and being outside the eligibility requirements of the social security system.

The author focus on these critical cohorts: 7-13 year cohort and 14-18 year cohort - which correspond to both primary and secondary phase of schooling in South Africa. The author also includes parent educational categories as proxies for socioeconomic status, which may influence education and health outcomes. The first stage regression also controls for gender and race and province fixed effects. Thus, the race fixed effects account for any trend across cohorts' racial groups. The province fixed effects account for any baseline difference across provinces.

In all model estimations, one needs two assumptions to be fulfilled: first, the instrument has to be relevant in explaining the probability of being treated, and this will be corroborated by the F-test of the first stage equation; and second, the exclusion restriction needs to hold, that is, the instrument should not influence the primary outcome directly through any channel other than treatment. In this case, this assumption means that differences in depression, academic failure, and teenage pregnancy between the treated and control groups during these cross-sectional periods (the years 2006, 2009, 2011, and 2015) can only be due to income redistribution.

For example, there is no reason to believe that control cohorts should have different educational, maternal, and mental health outcomes than the treated cohorts observed from the same year, same regions, and from the same household income category (less than $ 500 per month).

There is no other event in South African history that explains any difference in educational, maternal, and mental health outcomes that would affect precisely the treated cohorts but not the control cohorts. For this reason, the author is confident that income redistribution can explain the differences between the treated cohorts and control cohorts.

III. RESULTS

3.1 Descriptive analysis

Table 1 presents the exact difference between the treated and control groups. The author noted that individuals who benefitted from income redistribution (treated group) recorded a low probability of depression, academic failure, and teenage pregnancy than those not treated with income redistribution (control group).

Table 1: Descriptive statistics

Variable	Treated	Control
Benefiting from income redistribution	99.9%	0.0%
Female	52.4%	51.9%
In rich provinces	47.2%	48.6%
Reported depression	21.8%	24.9%
Reported academic failure	41.9%	47.9%
Reported teenage pregnancy	4.5%	4.9%
Observations	47529	45909

Source: Own elaboration with data from Stats-SA

3.2 Results of two-way 2SLS model

The tables present a comparative picture of how income redistribution averted depression, academic failure, and teenage pregnancy. The tables also show the sensitivity of these outcomes from income redistribution fluctuations during 2006, 2009, 2011, and 2015.

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When analysing the 2SLS model results, the author noted that the first stage regression's F-statistic is very large, pointing towards the instrument's strong validity (See Table 2). Thus, in Table 2, income redistribution grants proxied by the cohort instruments are determinants for improving depression outcomes.

Table 2: Sensitivity of mental health outcomes from income redistribution fluctuations in primary school cohorts

	2ND Stage Least Squares Model			
	2006	2009	2011	2015
1st stage	Grant	Grant	Grant	Grant
Primary cohorts (treatment group)	0.0769***	0.0799***	0.0801***	0.0816
	(0.0012)	(0.0025)	(0.0089)	(0.0028)
2nd stage	Depression	Depression	Depression	Depression
Income redistribution	-0.0432***	-0.0579 ***	-0.0721***	-0.0752***
	(0.0020)	(0.0018)	(0.0096)	(0.0064)
Race FE	YES	YES	YES	YES
Province FE	YES	YES	YES	YES
Age	YES	YES	YES	YES
Gender FE	YES	YES	YES	YES
Mother education FE	YES	YES	YES	YES
Father education FE	YES	YES	YES	YES
Mean for depression	0.2315	0.2214	0.2114	0.2103
Observations	16542	13571	12667	10326
F-stat 1stSLS	161.2805	153.1117	167.0624	149.1233
R squared 2nd SLS	0.0681	0.0551	0.0742	0.0587

***denote significant p-value at <0.05.Coefficients in brackets represents standard errors. Note: The results are from a 2SLS model. In the first stage equation, the dependent variable is the probability of benefiting from income redistribution. At the same time, the instrument is a dummy variable equal to 1 for the primary school cohorts who benefited from the social security grants system and 0 for the primary school cohorts who did not benefit from the social security grants system. In the second stage regression, the dependent variable is a dummy variable of "experiencing depression." Both regressions include race, province, and age, and gender fixed effects—source: General Household Survey (GHS) provided by Statistic South Africa.

For example, cases of depression were reduced by 4.32 percentage points in 2006. The mean for depression is 23.15 percent, in line with other mental health studies conducted in South Africa (Somefun & Fosto, 2020). Therefore income redistribution averted depression cases by 18.66 percent in 2006. Similarly, cases of depression were reduced by 7.52 percentage points in 2015.

The mean for depression is 21.03 percent. Therefore income redistribution averted depression cases by 35.76 percent. Table 2 confirms that the higher the share of income redistributed to the poor, the better the cases of depression in the primary school cohorts.

The study then examines whether income redistribution positively impacts depression outcomes in the secondary school cohorts. Table 3 shows a 2.32 percentage point reduced cases of depression in 2006. The mean for depression is 28.13 percent. Therefore income redistribution averted depression cases by 8.25 percent in 2006.

Similarly, cases of depression were reduced by 3.31 percentage points in 2015 for the secondary school cohorts. The mean for depression is 22.33 percent. Therefore income redistribution averted depression cases by 14.01 percent. Once again, the higher the share of income redistributed to the poor, the better the cases of depression. Table 3 also shows that the impact of income redistribution on depression outcomes is lower in

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the secondary school cohorts than in the primary school cohorts.

Table 3: Sensitivity of mental health outcomes from income redistribution fluctuations in secondary school cohorts

2ND Stage Least Squares Model				
	2006	2009	2011	2015
1st stage	Grant	Grant	Grant	Grant
Secondary cohorts (treatment group)	0.0619***	0.0699***	0.0701***	0.0726
	(0.0028)	(0.0039)	(0.0033)	(0.0031)
2nd stage	Depression	Depression	Depression	Depression
Income redistribution	-0.0232***	-0.0279 ***	-0.0291***	-0.0331***
	(0.0014)	(0.0011)	(0.0025)	(0.0029)
Race FE	YES	YES	YES	YES
Province FE	YES	YES	YES	YES
Age	YES	YES	YES	YES
Gender FE	YES	YES	YES	YES
Mother education FE	YES	YES	YES	YES
Father education FE	YES	YES	YES	YES
Mean for depression	0.2813	0.2514	0.2397	0.2233
Observations	12900	10322	10123	6987
F-stat 1stSLS	141.2005	123.4417	147.2824	129.1587
R squared 2nd SLS	0.0581	0.0551	0.0547	0.0639

The study then examines whether income redistribution positively impacts education outcomes, considering that it positively impacts depression. The idea behind this analysis is that good mental health should improve education outcomes. The author found in Tables 4 and 5 that income redistribution significantly improves academic failure in primary and secondary school cohorts. For example, income redistribution reduces academic failure by 9.86 percentage points in 2006, implying a 25.85 percent decline in academic failure for primary school cohorts (See Table 4).

The mean for academic failure was 56.13 in 2006 in the secondary school cohort. This mean estimation is in line with a study conducted in South Africa where it was reported that the number of learners enrolled in grade 1, only half make it to grade 12 - with higher dropouts recorded in the secondary phase of learning (Modisaotsile, 2012). Income redistribution reduced academic failure by 7.32 percentage points in 2006, implying a 13.04 percent decline in academic failure for secondary school cohorts (See Table 5). Both Table 4 and 5 demonstrate that the higher the share of income redistributed to the poor, the better the cases of academic failure.

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Table 4: Sensitivity of education outcomes from income redistribution fluctuations in primary school cohorts

2ND Stage Least Squares Model				
	2006	2009	2011	2015
1st stage	Grant	Grant	Grant	Grant
Primary cohorts (treatment group)	0.0769***	0.0799***	0.0801***	0.0816
	(0.0012)	(0.0025)	(0.0089)	(0.0028)
2nd stage	Fail to complete grade	Fail to complete grade	Fail to complete grade	Fail to complete grade
Income redistribution	-0.0986***	-0.1436 ***	-0.1561***	- 0.1589***
	(0.0065)	(0.0404)	(0.0409)	(0.0206)
Race FE	YES	YES	YES	YES
Province FE	YES	YES	YES	YES
Age	YES	YES	YES	YES
Gender FE	YES	YES	YES	YES
Mother education FE	YES	YES	YES	YES
Father education FE	YES	YES	YES	YES
Mean for failing a school grade	0.3815	0.3714	0.3655	0.3583
Observations	16542	13571	12667	10326
F-stat 1stSLS	111.1505	113.1100	117.0254	119.0101
R squared 2nd SLS	0.0581	0.0521	0.0612	0.0597

***denote significant p-value at <0.05.Coefficients in brackets represents standard errors. Note: The results are from a 2SLS model. In the first stage equation, the dependent variable is the probability of benefiting from income redistribution. At the same time, the instrument is a dummy variable equal to 1 for the primary school cohorts who benefited from the social security grants system and 0 for the primary school cohorts who did not benefit from the social security grants system. In the second stage regression, the dependent variable is a dummy variable of "failing to complete school grade." Both regressions include race, province, age, and gender fixed effects—source: General Household Survey (GHS) provided by Statistic South Africa.

Table 5: Sensitivity of education outcomes from income redistribution fluctuations in secondary school cohorts

2ND Stage Least Squares Model				
	2006	2009	2011	2015
1st stage	Grant	Grant	Grant	Grant
Secondary cohorts (treatment group)	0.0619***	0.0699***	0.0701***	0.0726
	(0.0028)	(0.0039)	(0.0033)	(0.0031)
2nd stage	Fail to complete grade	Fail to complete grade	Fail to complete grade	Fail to complete grade
Income redistribution	-0.0732***	-0.1109 ***	-0.1191***	-0.1201***
	(0.0014)	(0.0011)	(0.0025)	(0.0029)
Race FE	YES	YES	YES	YES
Province FE	YES	YES	YES	YES
Age	YES	YES	YES	YES
Gender FE	YES	YES	YES	YES
Mother education FE	YES	YES	YES	YES
Father education FE	YES	YES	YES	YES
Mean for failing a school grade	0.5613	0.5214	0.5197	0.5133
Observations	12900	10322	10123	6987
F-stat 1stSLS	101.7004	103.9400	107.9212	109.6007
R squared 2nd SLS	0.0511	0.0501	0.0499	0.0509

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The study then examines whether income redistribution positively impacts maternal health outcomes of children, considering that it positively impacts depression and academic failure. The author believes that improvement in income, better mental health, and exemplary academic achievements are positive incentives for keeping young girls focused on their school curriculums and discouraging teenage pregnancy.

Table 6 shows a 0.17 percentage point reduced cases of teenage pregnancy in 2006. The mean for teenage pregnancy is 4.94 percent, in line with the reported percentage by the Department of Basic Education in South Africa (Panday et al., 2009).

Therefore income redistribution averted teenage pregnancy by 3.44 percent in 2006. Similarly, cases of teenage pregnancy were reduced by 0.32 percentage points in 2015. The mean for teenage pregnancy in 2015 was 4.71 percent. Therefore income redistribution averted teenage pregnancy by 6.79 percent. Once again, the higher the share of income redistributed to the poor, the better the cases of teenage pregnancy. Indeed government policy can avert teenage pregnancy (Chung, Kim, & Lee, 2018).

2ND Stage Least Squares Model				
	2006	2009	2011	2015
2nd stage	Teenage pregnancy	Teenage pregnancy	Teenage pregnancy	Teenage pregnancy
Income redistribution	-0.0017***	-0.0019 ***	-0.0029***	-0.0032***
	(0.0004)	(0.0005)	(0.0002)	(0.0003)
Race FE	YES	YES	YES	YES
Province FE	YES	YES	YES	YES
Age FE	YES	YES	YES	YES
Mother education FE	YES	YES	YES	YES
Father education FE	YES	YES	YES	YES
Mean for teenage pregnancy	0.0494	0.0488	0.0479	0.0471
Observations	6760	5409	5304	3661
F-stat 1stSLS	98.1254	93.6658	97.8854	99.5879
R squared 2nd SLS	0.0711	0.0691	0.0689	0.0674

Table 6: Sensitivity of maternal health outcomes from income redistribution fluctuations in secondary school cohorts

***denote significant p-value at <0.05.Coefficients in brackets represents standard errors. Note: The results are from a 2SLS model. In the first stage equation, the dependent variable is the probability of benefiting from income redistribution. At the same time, the instrument is a dummy variable equal to 1 for the secondary school cohorts who benefited from the social security grants system and 0 for the secondary school cohorts who did not benefit from the social security grants system. In the second stage regression, the dependent variable is a dummy variable of "reported pregnancy." Both regressions include race, province, age, and gender fixed effects—source: General Household Survey (GHS) provided by Statistic South Africa.

The paper then focuses on gender-based differences in the impact of income redistribution on depression and academic failure. The study repeated the same regressions for the male population group and the female population group separately. In Table 7, the author discovered that income redistribution improves depression and academic failure more for boys than girls.

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Table 7: 2SLS estimation of the impact of income redistribution on education and health outcomes by gender

2SLS	Boys	Girls
2nd stage	Primary : Depression	
Income redistribution	-0.0702***	-0.0522***
	(0.0026)	(0.0031)
	Secondary: Depression	
Income redistribution	-0.0313***	-0.0253***
	(0.0034)	(0.0029)
	Primary : Academic failure	
Income redistribution	-0.1590***	-0.1196***
	(0.0039)	(0.0043)
	Secondary: Academic failure	
Income redistribution	-0.1358***	-0.0759***
	(0.0048)	(0.0051)
Race FE	YES	YES
Province FE	YES	YES
Age FE	YES	YES
Mother education FE	YES	YES
Father education FE	YES	YES
Mean for depression (primary)	0.1986	0.2386
Mean for depression (secondary)	0.2439	0.2539
Mean for academic failure (primary)	0.3491	0.3891
Mean for academic failure (secondary)	0.4989	0.5589
Observations (primary)	25279	27827
Observations (secondary)	19198	21134
F-stat 1stSLS (primary- depression)	105.1156	109.3584
R squared 2nd SLS(primary-depression)	0.0721	0.0800
F-stat 1stSLS (primary- failure)	102.1058	112.3087
R squared 2nd SLS(primary-failure)	0.0699	0.0739
F-stat 1stSLS (secondary-depression)	101.9854	107.2251
R squared 2nd SLS(secondary-depression)	0.0711	0.0739
F-stat 1stSLS (secondary-failure)	100.4635	103.8881
R squared 2nd SLS(secondary-failure)	0.0711	0.0801

*** denote significant p value at <0.05. Coefficients in brackets represent standard errors. Note: The results are from a 2SLS model. Source GHS

IV. DISCUSSION

The current paper discovered that income redistribution has a positive role, concurrently averting depression, academic failure, and teenage pregnancy. This intersection is essential, considering the extensive evidence showing the positive societal outcomes arising from educational, maternal, and mental health improvement.

The impact of income redistribution is more robust for boys than girls, similar to the evidence reported by other papers (Mostert & Vall, 2020).

Girls are more susceptible to depression (Twenge et al., 2021) than boys, which explain the lower impact of income redistribution in the girls' populations. Furthermore, income redistribution is more robust for the younger primary school cohorts than secondary school cohorts. These results reflect the expensive nature of raising children, with costs increasing as children grow older – diminishing the purchasing power on income redistributions.

The study also finds that the educational, maternal, and mental health outcomes are sensitive to income redistribution fluctuations-

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with big improvements recorded during the peak of income redistribution.

4.1 Policy implications

The study's results have significant policy implications. The current Covid-19 lockdown policies and on-going economic recession threaten the South African social security system.

The government imposed austerity measures that lowered grant pay-outs widened the existing income inequalities (Makinana, 2021). The combination of these factors will reverse the income redistribution gains and potentially worsen educational, maternal, and mental health outcomes. South Africa may need to improve income redistribution throughout the lockdown period or face a possibility of an inequality crisis that will rob the developmental outcomes of disadvantaged children.

4.2 Robustness test

In this section, the author provides robustness checks and additional results to reinforce the current estimation's validity. Tables 1A in the Appendix show the results of the OLS regressions for both the primary and secondary school cohorts. The variable of interest is now the variable in the survey that identifies the receipt of the grant at the household level. The study included parent education, race, age, and province fixed effects. As explained above, there are reasons to believe that this is not a randomly assigned program. Therefore, the OLS estimation may overestimate or underestimate the income redistribution effects on education and health outcomes. Many unobserved variables may directly affect the education and health outcomes, such as household income from relatives, access to the necessary information, and proximity to school and healthcare facilities. Indeed, the results in Tables 1A are all substantially bigger in magnitude than the baseline results of the 2SLS models presented in Tables 7, and this is consistent with the OLS model overestimating the actual effects of the income redistribution results.

Finally, the study ran some placebo regressions in which the study "pretended" that control (unaffected) cohorts were treated with fake income redistribution. Thus, the author excluded the cohorts genuinely affected by the income redistribution from the sample. The author then assigned all males as treated cohorts affected by the fake reform and used females as comparison cohorts. The author then ran the same 2SLS.

One can see in Table 2A in the Appendix that the F-test of the first-stage regression is extremely low (which suggests that the instrument is not relevant). The treatment variable is not significant in any of the periods analysed. Therefore, the results of these placebo tests analysing the effects of the fake income redistribution reinforce the validity of the study's identification strategy and provide additional evidence of the fulfilment of the exclusion restriction criteria as any cohort-specific events that are not captured by the model that could be biasing the main results should also provide significant results in these placebo tests.

4.3 Limitations

The paper acknowledges that the current binary variables do not capture all outcomes linked to these households. There is no advance information on the determinates of educational, maternal, and mental health outcomes in the Statistics South Africa data. Thus, the paper interprets the results as providing evidence of substantial improvement in these outcomes attributed to income redistribution while not capturing other qualitative changes that may further explain the improvement of these outcomes. For example, academic success can also be driven by teaching style and incentives for teaching (Camelo & Ponczel, 2021).

Unfortunately, the Statistics South Africa data does not contain information on teaching styles and incentives for teaching, which should have been controlled in the analysis. Nevertheless, the author believes such omission will not significantly influence the current estimation considering that parent income is still a competent primary driver of better education outcomes.

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V. CONCLUSION

Income redistribution plays a crucial role in advancing disadvantaged children's educational, maternal, and mental health outcomes. For example, income redistribution averts depression, academic failure, and teenage pregnancy concurrently. Higher-income redistributions intensify these outcomes.

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Job Influence on Practice of Exclusive Breastfeeding among Working Class Mothers in Urban Communities of Ekiti State, Southwestern; Nigeria

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ABSTRACT

Breastfeeding is the first fundamental right of the child. Exclusive breastfeeding means giving a baby no other food or drink, not even water, in addition to breastfeeding [Piyush, 2007]. In other to maintain the economic status and boost family income, women started to work in different sectors, which make it difficult for them to practice exclusive breastfeeding.

The study descriptive cross sectional study design, the populations studied were the working class nursing mothers attending the infant welfare clinics of urban communities in Ekiti- state. The study instruments were structured questionnaire. The data collected were analyzed and presented using tables and chart. The results revealed that acceptability of exclusive breastfeeding concepts is high among the population studied. It was discovered that majority of the respondents {99%} agreed and strongly agreed that exclusive breast feeding is desirable, feasible, nutritious and helps in child growth and development.

Keywords: practise, breastfeeding, mothers, job, influence.

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Job Influence on Practice of Exclusive Breastfeeding among Working Class Mothers in Urban Communities of Ekiti State, Southwestern; Nigeria

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ABSTRACT

Breastfeeding is the first fundamental right of the child. Exclusive breastfeeding means giving a baby no other food or drink, not even water, in addition to breastfeeding [Piyush, 2007]. In other to maintain the economic status and boost family income, women started to work in different sectors, which make it difficult for them to practice exclusive breastfeeding.

The study descriptive cross sectional study design, the populations studied were the working class nursing mothers attending the infant welfare clinics of urban communities in Ekiti-state. The study instruments were structured questionnaire. The data collected were analyzed and presented using tables and chart. The results revealed that acceptability of exclusive breastfeeding concepts is high among the population studied. It was discovered that majority of the respondents {99%} agreed and strongly agreed that exclusive breast feeding is desirable, feasible, nutritious and helps in child growth and development. Above half of the respondents {55%} agreed that working hours is a barrier to breastfeeding. The study revealed that majority of the respondents {90%} agreed to the fact that working class nursing mothers need flexible working hours for effective practice of exclusive breastfeeding. The study concluded that breastfeeding is desirable and feasible and that government should increase maternity leave to six months after delivery for effective practice of exclusive breastfeeding.

Keywords: practise, breastfeeding, mothers, job, influence.

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I. INTRODUCTION

Breastfeeding is a normal way of providing young infants with the nutrients needed for healthy growth and development (World Health Organization, 2013). It meets the nutritional as well as emotional needs of the infant [Piyush, 2010]. The practice of breast feeding in the United States has been declining since its peak in 1982, when about 60% of mothers breastfed their newborns [Donna, 2012]. The greatest decline occurred in women who were black, younger age, low-income, poorly educated or parents of low birth weight infants, and working class mothers. [Donna, 2012]. In other to maintain and boost the economic status of the family, most mothers work in different sectors, which make it difficult for them to practice exclusive breastfeeding. Only about one third [36%] of new born are exclusively breastfed for the first six months of life.

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According to Moreno [2012], factors that influence the duration and barriers of breast feeding include lactating problems with previous child, family opinions, rigid feeding schedules, excessive maternal pre occupation, and working out of the home. Others are, poorly developed nipple, acute mastitis, over anxiety, breast abscess and unwillingness. UNICEF stated that every year over one million infants die and millions of other children are impaired, because they are not adequately breastfed [Unicef 2010].

Daily, between 3000-4000 infants die from diarrhoea and acute respiratory infections because of poor feeding by their mothers.

Thousands more succumb to other illness and malnutrition. [Unicef 2013].

Numerous studies have revealed that one of the barriers to breastfeeding is work status. With enlarged urbanization and industrialization, more women of the reproductive age have joined the workforce [Wyatt, 2012]. The Bureau of labour statistics reported that in 2012, "51% of U.S. women with infants were employed outside the home" [Libbus & Bullock, 2012] and according to the Ross Mother's survey, only 22% of women employed full time breastfed their infants compared to 35.4% of mothers who were not employed [Libbus & Bullock, 2012]. Considering the benefits of EBF, therefore studying job influence on the practice of exclusive breast-feeding among working class mothers is worthwhile and justified. The broad objective is to study the effects of job on the practice of exclusive breastfeeding among career mothers in Ekiti State.

Specific objectives are

1. To determine the knowledge of working class mothers towards exclusive breastfeeding.
2. To assess the attitude of working class mothers towards exclusive breastfeeding.
3. To identify the influence of job on the practice of exclusive breastfeeding.

II. METHODOLOGY

The study was carried out on mothers attending the infant welfare clinic of in the urban communities in Ekiti state. Ado and Ikere local governments area were chosen for the study being the predominantly urban local government in the state. Two health facilities were randomly selected from each local government. Equal numbers (25) of the questionnaires were allocated to each health facility.

The sample size for this study is 100 respondents. Convenient sampling method was used to select the participants for the study. Data were cleaned manually and analyzed using statistical package for social science (SPSS) version 21. The study included working class mothers attending the infant welfare clinic in chosen health facilities and exclude working class mothers whose children are critically ill. Ethical certificate of clearance was obtained from the Ethics and Research committee of national Open University. Participation was voluntary, informed consent was obtained, confidentiality was maintained and the study was beneficence and no harm to the participant. There was no Conflict of interest.

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III. RESULTS

Table 1: Socio-Demographic Data

Socio demographic characteristics	Frequency N=100	Percentage N=100
Age		
20 - 25years	11	11
26 -36 years	74	74
37 -49 years	15	15
Marital Status		
Married	98	98
Widowed	2	2
Divorced	----	----
Religion		
Christianity	93	93
Islam	7	7
Traditional	---	---
Educational level		
Primary	1	1
Secondary	8	8
Diploma	37	37
Degree	54	54
Working experience		
≤ 2years	29	29
3-6years	44	44
7-10years	25	25
≥11 years	2	2
No of children		
1-2	69	69
3-4	30	30
5-6	1	1
≥7	---	--

The table above reveals that greater percentage of the respondents 74% falls within the age range of 26 -36 years, majority of the respondents were married and Christian by religion. Most of the respondents 54% were degree holders and greater percentage of the respondents 69% have 1-2 children.

Table 2: Perception of mothers about exclusive breastfeeding

Questions	Strongly Agreed	Agreed	Disagreed	Total
Exclusive breastfeeding is desirable	53	46	1	100
Breastfeeding helps in child's growth	54	46	-	100
Breast milk is nutritious, protective to the baby and less expensive	75	25	-	100
Other feeding options are equally good as breastfeeding	8	20	72	100
Exclusive breastfeeding is only feeding option for mothers that are not working	3	4	93	100

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The above table shows that 53% of the respondents strongly agreed that exclusive breastfeeding in the first six months of life is desirable and feasible, while 46% of them agreed that exclusive breastfeeding in the first six months of life is desirable and feasible, only 1% of the respondents disagreed.

Also, 54% of the respondents strongly agreed that breastfeeding helps in child's growth while 46% of them agreed that breastfeeding helps in child's growth. Greater percentage of the respondents 75% strongly agreed that breast milk is more nutritious, protective to the baby and less expensive, while 25% agreed that breast milk is more nutritious, protective to the baby and less expensive.

On the other hand, 72% of the mothers disagree that other feeding options are not comparable to breastfeeding. Also, 93% disagree with the opinion that exclusive breastfeeding is meant for mothers that are not working only.

Table 3: Respondents opinion on job and exclusive breastfeeding

Option	Frequency N=100	Percentage=100
Do you agree that working mothers can practise baby friendly?		
Strongly agreed	34	34
Agreed	57	57
Disagreed	7	7
Strongly disagreed	2	2
Flexible working hours is need by mothers		
Strongly agreed	35	35
Agreed	58	58
Disagreed	2	2
Strongly disagreed	5	5
Working hour is a barrier to exclusive breastfeeding		
Strongly agreed	17	17
Agreed	38	38
Disagreed	35	35
Strongly disagreed	10	10
Increasing maternity leave period is needed to promote exclusive breastfeeding		
Strongly agreed	66	66
Agreed	29	29
Disagreed	3	3
Strongly disagreed	2	2
Feeding option for baby while mother is at work?		
Pap	8	8
Glucose and water	4	4
Baby's formula	36	36
Expressed breast milk	52	52
How often do you breastfeed when on duty?		
On demand	39	39
Three hourly	47	47
After working hours	12	12
Twice daily	2	2

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Baby friendly facility at work place		
Mother crèche	51	51
Allowing bringing baby to work	25	25
Flexible working hour	8	8
No facility at all	16	16

The above table shows that above half of the respondents 57% agreed and 34% strongly agreed that working mothers can practise baby friendly.

Also, 58% of the respondents agreed and 35% strongly agreed that working mothers needs flexible working hour for effective practise of exclusive breastfeeding. Also, 38% agreed, 17% strongly agreed that working hour is a barrier to the practise of exclusive breastfeeding while 10% of them strongly disagreed, 35% disagreed that working hour is a barrier to the practise of exclusive breastfeeding.

Also, greater percentage of the respondents 66% strongly agreed that government should increase maternity leave to six months for effective practise of exclusive breastfeeding, 29% agreed that government should increase maternity leave to six months for effective practise of exclusive breastfeeding.

More so, above half of the respondents that 52% of the respondents fed their babies with expressed breast milk, 36 % with baby's formula, 8% with pap and 4% of the respondents fed their babies with glucose and water when at work. Above third of the respondents 39% breastfed their babies on demand, 47% of them breastfed their babies 3 hourly, 12% of them breastfed their babies after working hours while minority 2% of the respondents breastfed their babies twice daily.

About half, 51% of the respondents have mother crèche, 25% were allowed to work with baby, 7% enjoyed flexible working hours and 16% has no is the facility in their working place that favoured baby friendly.

IV. DISCUSSION OF FINDINGS

Results revealed that levels of awareness and acceptability of breastfeeding concepts is high among the population studied. The results further indicates that majority of mothers appreciates the benefits of exclusive breast feeding in agreement with Grant *et al* in their finding. It was discovered that majority of the respondents {99%} agreed and strongly agreed that exclusive breast feeding is desirable, feasible , nutritious and helps in child growth and development; similar to the findings of Piyush *eta*l. Above half of the respondents {55%} agreed that working hours is a barrier to breastfeeding as previously reported by Kennedy et al. Majority of the respondents {93%} agreed /strongly agreed that flexible working hours is required for the effective practice of exclusive breastfeeding. More than half {52%}suggested extension of maternity leave to six months to be able to practice exclusive breastfeeding. This is in agreement with findings of Rea, Kearney, Picado and Moreno in their respective studies. Some of them {48%} still results in partial breastfeeding with a proof that there is no adequate facilities in their various places of work to enhance the policy and encourage the mothers to practise the policy adequately and effectively.

In conclusion, most of the respondents have adequate knowledge of the benefits of exclusive breastfeeding and desires to practise it. Factors that hinder the practise include limited resources, government policy, workplace flexibility option and lack of baby friendly facilities in place of work to enhance the practise of exclusive breastfeeding.

The following recommendations were made based on the findings.

Health care workers should continue to educate mothers on the advantages of breast milk over artificial or baby formula to the unwilling mothers and show good examples by practising baby friendly.

The Government should make policy for effective practise of baby friendly initiatives like extension of maternity leave, flexible working hours and provision of mothers crèche in the place of work.

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