EDUCATION AS AN ANALYSIS OF POVERTY STATUS OF HOUSEHOLDS IN LIMPOPO, SOUTH AFRICA

Abdul Maluleke
Tshwane University of Technology, South Africa

Emmanuel Innocents Edoun
Tshwane University of Technology, South Africa

Solly Poe
Tshwane University of Technology, South Africa

Abstract

The lives of many South Africans have been profoundly influenced by the policies of the racially oppressive apartheid government that ruled the country from 1947 to 1994. The provision of basic services under the apartheid government was very poor, particularly for the greater Black majority living in rural homelands. As a result, the country has seen underdevelopment in human capital of the overwhelming majority of the population in rural areas, resulting in low levels of well-being and high levels of poverty and inequality that have persisted to this day. Using secondary data sets from the Living Conditions Survey (LCS) 2014/2015 conducted by Statistics South Africa, this research aims to analyse the role of education on the economic well-being status of households in Limpopo Province of South Africa. The official absolute income poverty line of R10 680 (lower bound) per capita per annum in 2021 prices were used. In order to establish the relationship between education, socio-economic factors and the poverty status of an individual or a household, a binary regression model was used. The results obtained revealed that lower educational attainment is associated with a higher prevalence of household poverty (low well-being status). Additionally, findings indicate that age, marital status and household status have a direct impact on well-being.

1. Introduction

Human well-being is a multifaceted subject spanning decades and geographies due to its capability to inculcate varied academic subjects (Camfieled *et al.*, 2018). The existing well-being literature, however, has mainly considered subjective self-reported well-being at individual-level using indicators (Webster *et al.*, 2021; Conger, Conger & Martin, 2010). Linked to lack of or lower well-being is lack of educational attainment; this is supported by various research in the literature (Gebresilassie, 2014:134; Ferrante, 2009; Cunado & de Garcia, 2012). According to Bloom *et al.,* (2005), Palmer, Wedgwood, Hayman, King and Thin (2007), Thomson (2008) and Badat and Sayed (2014), education could be seen as a tool that would lead to changes in both rural and urban communities. Various research over the past few years focused on the importance of education in a developing society (Zwane, 2020; Naveed & Sutoris, 2020; Wanka, 2014), however, there has been a paucity of studies examining the relationship between education and well-being within a South African context.

As one of the primary determinants of individual well-being, the influence of education has produced some interesting results. In general, the evidence regarding the relationship between economic well-being and educational attainment is relatively ambiguous (Ferrante, 2009; Cunado & de Garcia, 2012). Research by Botha and Booysen (2014:163) and Kahneman and Krueger (2006:2) likewise argued that there is a positive association between educational attainment and well-being. The focus of this study is on education as an indicator of economic well-being status within households in Limpopo province, South Africa.

2. Theoretical and Empirical Literature

2.1 Educational attainment and well-being in South Africa

Since the dawn of democracy in 1994, South Africa has continued to invest billions of funds into the education system and the provision of other basic services. Despite the persistent efforts from the government in making education accessible to everyone, rural households across the country more specifically are still characterised by low levels of well-being and low educational attainment rates. In addition, majority of these households are based in the more rural provinces notably; Limpopo, the Eastern Cape and Mpumalanga (Rhodes & Mckenzie, 2018). Limpopo Province is one of the poorest and most rural provinces in the country. Poor households within the province are characterised by low well-being status, low levels of education, difficult and time-consuming and lack of access to; health care services, transportation and few opportunities for lucrative employment (Stats SA, 2016; Wanka, 2014:2). As a result, many households turn out to have very low well-being status in this province.

Education is seen as a key driver in poverty reduction and to achieve social justice in South Africa (Wanka, 2014:18). The OECD's "How's life? Report (2017) proclaim that people's achievement prospects are widely linked to the various dimensions of well-being. It further exposes the disparity in the quality of life, life expectancy and happiness when education is taken into consideration. According to OECD (2017), educational attainment is one of South Africa's weakness that contributes to the well-being status of its citizens.

A study done by Wanka (2014), using the Income and Expenditure Survey (IES) showed that households headed by well-educated persons had a lower portability of poverty. Evidence from other countries can also be seen in a research conducted by Childs

(2018), which showed that employment status and education had a huge effect on the well-being status of Australian youth. Binder and Coad (2011:275) found that there is a positive association between education and happiness at lower quantiles but a negative on in the upper quantiles. Further suggesting that majority of people who are happy have a higher educational attainment as opposed to those with lower educational attainment.

2.2 The influence of education on well-being status

As one of the primary determinants of individual well-being, the influence of education has produced some interesting results. In general, the evidence regarding the relationship between economic well-being and educational attainment is relatively ambiguous (Ferrante, 2009; Cunado & de Garcia, 2012). Research by Botha and Booysen (2014:163) and Kahneman and Krueger (2006:2) also argued that there is a positive association between educational attainment and well-being. Previous studies on the relationship between well-being and education many mainly focused on developed countries, where education has found to be a major determinant of well-being. With respect to rural provinces in developing countries such as Limpopo, evident research on the link between education and well-being is less common (Botha & Booysen, 2014).

Despite the substantial body of knowledge examining the correlates of educational attainment and its bearing on well-being, the interactions between how household well-being and education relate to each other have received unexpectedly little attention. Survey data as well as reports from both South African and international studies on education and well-being continue to reveal that, education and well-being are somehow positively correlated. Walker (2014:418) argued that education is a useful tool that should be prioritised to advance economic growth and reduce inequality in South Africa. Chen (2011:117) endeavoured to determine the impact of education on happiness in four Asian countries using data from the East Asian Social Survey (EASS). Chen (2011) finds that individuals who received more education are associated with happiness due to having access to having better life conditions; these conditions are related to well-being.

Geda, de Jong, Kimenyi and Mwabu (2005:10) conducted a study using the 1994 Welfare Monitoring Survey in Kenya and found educational attainment to be a significant determinant of poverty in Kenyan households. The results further indicated that the lack of secondary education increased the probability of the house being poor. In their theoretical paper, Joboku *et al.,* (2021), reported that Technical and Vocational and Educational Training (TVET) colleges were seen as great tools to increase human capital and alleviate poverty of the Nigerian population. Although some studies argue that income is more essential in enhancing well-being and happiness (for example Easterlin, 1974; Diener & Biswas-Diener, 2001:119 & Kushlev, Dunn, & Lucas 2015:483), recent research agrees that absolute income plays a crucial role in enhancing one's well-being (Chen, 2011:118; Ferrer-i-Carbonell, 2005; Ball & Chernova, 2008). This arise since education is regarded as one of the significant investments in human capital, and educational attainment is highly correlated with absolute income (Chen, 2011:118).

3. Data and Methods

3.1 Data description

The data for this research was obtained from the Living Conditions Survey (LCS) 2014/2015, conducted by Statistics South Africa (Stats SA) during the period 13 October 2014 to 25 October 2015 and embargoed until January 2017 after which it was accessible to the public. The LCS is one of Stats SA's common periodic survey conducted every five years with the aim of collecting data that depicts South Africa's households living conditions and extent of poverty. Furthermore, the 2014/2015 LCS is the most recent survey conducted by Stats SA. The LCS data were chosen for the present study because they are representative of the national and provincial level economic activities that are aligned to the objectives of the study. The LCS was conducted with specific objectives in mind, one of which was to provide relevant statistical information on household consumption and poverty levels and patterns (Stats SA, 2017).

3.2 Population and sampling

The information contained in the LCS was collected from 23 380 households across South Africa over a period of 12 months. When collecting the data, the survey used a combination of the diary and recall methods wherein households were required to answer a variety of questions from the questionnaire developed and administered by Stats SA over a four-week period to document household daily acquisitions.

The LCS study population consisted of all households across South Africa, with 30 818 households sampled to take part in the survey. Out of these, the sample realisation constituted of 27 527 (83,65%) (Stats SA, 2017:61). However, due to some of the sampled households being out of scope and being unoccupied; only 23 380 households participated in the study. This study will focus only on the households from the Limpopo Province. The response rate for Limpopo Province was at 95.6%, with 2 882 households (11 611 persons) participating in the survey (Stats SA, 2017:62). The survey sample was comprised of all domestic households, holiday homes and households on workers' residences. Institutions such as prisons, hospitals, dormitories for scholars, old age homes and student accommodation were excluded from the study sample (Stats SA, 2017:4). The study sample also omitted boarding houses, hotels, lodges and guesthouses.

3.2 Data Analysis

The data and all association information for this study was were obtained from Stats SA and imported into the Statistical Package for Social Sciences (SPSS) program version 26. The statistical analyses were performed using Microsoft Excel, SPSS and STATISTICA computer programs.

4. Objective method used to measure well-being

The most vital step in measuring well-being is determining the method of measurement and principles that guides the measurement. Objective poverty measures are based on a poverty definition wherein people are considered poor if their income or expenditure is below a specific level (below the poverty line); or non-poor if it falls above the set poverty line. The poverty line is used a standard to determine or track the poverty status of an individual or household.

The economic well-being analysis in this study is based on the absolute poverty measure. The official absolute poverty lines are the starting point of analysis and are constructed using the Cost-of-Basic-Needs (CBN) approach through which well-being is linked to the consumption of goods and services. These poverty lines are money-metric based and are used to indicate the threshold on which poor and non-poor individuals can be distinguished. In South Africa, the most and frequent used poverty income poverty lines are the Lower Bound Poverty Line (LBPL) and Upper Bound Poverty Line (UBPL) developed by Stats SA (Stats SA, 2018:3). Changes in living costs require an annual review and update of the poverty line to preserve the relevance and integrity of the poverty line (Stats SA, 2019:3). Consequently, this study employs the "lower-bound" and "upper-bound" poverty lines which amount to R890 x12 = R10 680 per capita per annum and R1 335 x 12 = R16 020 per capita respectively (in 2021 prices). The per annum amounts are used to predict those consuming below or above the threshold. Households are considered poor if their income or expenditure is below the poverty line; or non-poor if it falls above the set poverty line. Consistent with similar studies within the South African context, this study used the lower bound poverty line of R10 680 per capita per annum. Table 1 below presents the list of inflation-adjusted poverty lines developed by Stats SA between 2006 to 2021.

Table 1 − Stats SA inflation adjusted poverty lines from 2006 to 2021 (per person per month in rands)

Year	Food Poverty line	Lower bound poverty line	Upper bound poverty line
2006	219	370	575
2007	237	396	613
2008	274	447	682
2009	318	456	709
2010	320	466	733
2011	335	501	779
2012	366	541	834
2013	386	572	883
2014	417	613	942
2015 (April)	441	647	992
2016 (April)	498	714	1 077
2017 (April)	531	758	1 138
2018 (April)	547	785	1 183
2019 (April)	561	810	1 227
2020 (April)	585	840	1 268
2021 (April)	624	890	1 335

Source: Stats SA (2021)

4.1 Logistic regression

In carrying out empirical analysis on the impact of educational attainment on the economic well-being status, most studies used the binary logistic regression mode for instance (Endeshaw & Adugnaw, 2019:32; Michael *et al.*, 2019). The binary logistic regression model is suitable in this case because the dependent variable which is economic well-being proxied by poverty is binary in nature and takes two values; poor or non-poor.

Logistic regression is a popular mathematical modelling procedure used in the analysis of data to describe the relationship of several independent variable to a dichotomous dependent variable (Kleinbaum & Klein, 2010:5; Field, 2012:761). It is one of the most widely used statistical procedures in fields such as medical statistics, credit rating, social statistics and econometric and similar areas (Hilbe, 2015:ix). The logistic regression model is a branch of the Generalised Linear Models (GLMs). GLMs are an extension of classical linear models, and all probability models are considered part of GLMs. Logit and probit models are widely used members of the family of GLMs (Cakmakyapan & Goktas, 2013:1). There are only two categories (dichotomy) of the response variable in binary logit and probit models. The occurrence and non-occurrence of these events are the groups of the dependent variables.

The primary reason why the logistical model is so popular is that the logistic function f(z) is intended to represent a probability that always ranges from 0 to 1. Therefore, the logistic model is designed to ensure that any variable outcome that we predict is always a certain number between 0 and 1 (i.e. poor and non-poor in this study). Binary logistic regression is useful in the analysis where the prediction of the outcome variables is based on two categorical outcomes (Field, 2012:761).

Logistic regression is based on the principle of expressing multiple linear regression equation in logarithmic terms (referred to as logit) (Field, 2012:762). The logistic regression model predicts the likelihood of an event occurring for a given person based on the observations of whether the event did occur for that given person.

4.2 Binomial Logit Model for binary data

The logit model is a binomial type of distribution that has two possible outcomes (i.e. they have binary response variables). The outcome variables are classically represented by "success" and "failure" outcomes by 1 and 0 often referred as the Bernoulli trial named after well-known mathematician Jacob Bernoulli. A Bernoulli trial has probabilities $P(Y = 1) = n$ and $P(Y = 0) = 1 - \pi$, for which $E(Y) = \pi$. This is the special case of the binomial distribution with $n = I$. The probability mass function is expressed as:

$$f(y; \pi) = \pi^y (1 - \pi)[\frac{\pi}{1 - \pi})]y$$

$$= (1 - \pi) \exp [y (\log \frac{\pi}{1} - \pi)]$$

When working with GLMs for binary data, we let Y denote a binary response variable, such as the result of a medical treatment (success, failure). Each observation has one of two outcomes, denoted by 1 and 0, which we treat as a binomial variate for a single Bernoulli trial.

The mean $E(Y) = P(Y = 1)$. We denote $P(Y = 1)$ by $\pi(x)$, reflecting its dependence on values x = (x1,....., xp) of explanatory variables. The variance of Y is:

$$var(Y) = \pi(x)[1 - \pi(x)]$$

which is the binomial variance for $n = 1$. Among various binary models, the logit model has been popular in estimating poverty. Dudek and Lisicka (2013) argue that the binary logit model is suitable when dealing with dichotomous variables such as poverty. In

addition, Cameron and Trivedi (2005) as well as Hardin Hilbe (2007) recommend the logit model when assessing poverty. In table 2 the explanatory variables for the binary regression model are reported.

Table 2 - List of explanatory variables for the binary regression model

Explanatory Variables	Explanation of variable
Age	*Age of household head*
Gender	*Gender classification of household head* Male dummy: 0=No, 1=Yes Female dummy: 0=No, 1=Yes
Education	*Educational attainment of household head* Matric education dummy: 0=No, 1=Yes Post Matric education dummy: 0=No, 1=Yes
Household size	*Size of the household* Less than or equal to 3: 0=No, 1=Yes 4 to 6: 0=No, 1=Yes 7 to 9: 0=No, 1=Yes More than 9 0=No, 1=Yes
Marital status	*Marital status of household head* Married dummy: 0=No, 1=Yes Living with partner dummy: 0=No, 1=Yes Never Married dummy: 0=No, 1=Yes Widower dummy: 0=No, 1=Yes Separated dummy: 0=No, 1=Yes Divorced dummy: 0=No, 1=Yes

Source: Author's own compilation

5. Results and Discussion

5.1 Descriptive Analysis

The secondary data for this study were analyzed and then summarized using descriptive statistics. For the present study, descriptive statistics include frequency tables and cross-tabulations for the predominant nominal data. The data were downloaded, ordered, and the percentage results were calculated using Statistical Programme for Social Sciences (SPSS) version 26 and exported to Microsoft Excel. The descriptive statistics function of SPSS was used to conduct the descriptive analysis of the data.

According to the LCS, the sample included all the residents of the household who were at least one year(s) of age. The age distribution indicates that majority of the participants were between 1 and 18 years of age. The age profile of participants was deemed acceptable as families (households) usually have more children than elderly people. This result is in sync with the population age structure in South Africa where up to 58% of the nearly 54 million people in the country are aged between 18 and 50 years (Index Mundi, 2015:1). Furthermore, the age group 18 – 50 years of age are the most economically active group in many countries (Population Reference Bureau, 2015:1), they are most likely to participate in most surveys conducted by Statistics South Africa.

The gender composition of the sample was 45.20% for males and 54.80% for females. One of the main sex distribution indicators is the sex ratio. It shows the number of males

per 100 females. If it is above 100, it shows the predominance of males over females, and vice versa. According to Stats SA, the sex representativeness of South Africa during the 2011 Census was 95 (88 for Limpopo Province). In addition, the Census showed Limpopo alongside Eastern Cape were the most affected provinces by inter-provincial migration in terms of outmigration (Stats SA, 2012:19). This study submits that males are still, in certain circumstances, more likely to be the breadwinners and the sample distribution was representative. However, contrary to findings above, the LCS reported that there were more male-headed households (58,64%) compared to those headed by females (41,36%), accounting for two-fifths of households in the LCS 2014/2015. In addition, the LCS found a greater gender parity in Coloured and Black households where there was close 50/50 split (58,88% versus 41,12% and 57,21% against 42,70% respectively) (Stats SA, 2017:10). Using cross-sectional survey data of Debre Berhan town in Ethiopia; Endeshaw and Adugnaw (2019:32-33) found that female household headship has been on the rise in many African developing countries.

With regards to educational attainment of the sampled respondents, Figure 1 indicates that most of the respondents had attended some form of schooling (62.4%), 9,9% had completed Matric/Grade 12 and 3.7% had some form of matric certificate. Approximately, 22.1% of the sample had not attended any form schooling. A very low fraction of the respondents had some form of post matric qualification. While it would be fascinating to find out how educational attainment affects the well-being status, several key issues still need to be addressed. One significant argument relates to what exactly is education, how to measure educational attainment and whether educational qualifications are key indicators of educational level.

Figure 1- Educational attainment background of respondents
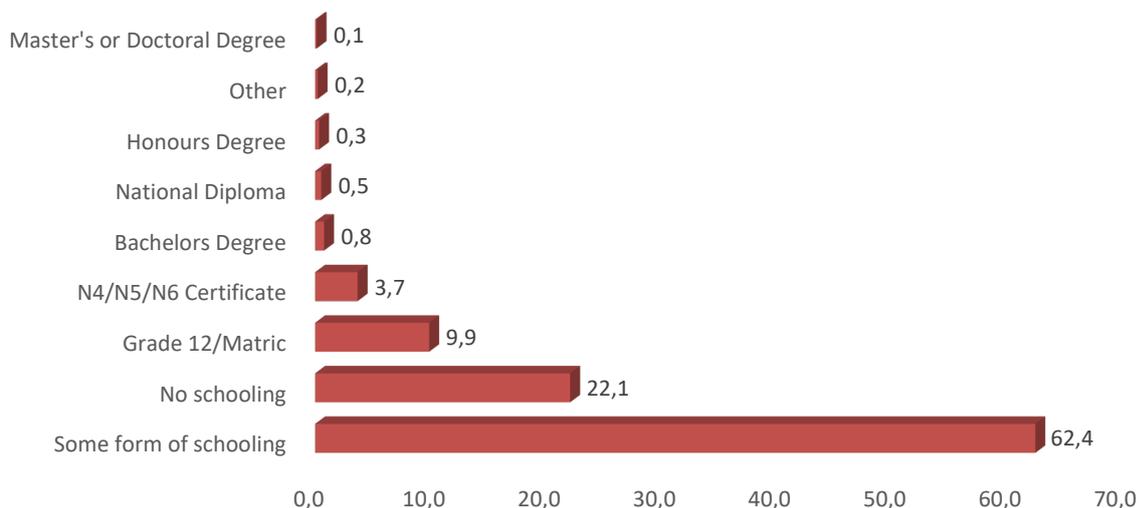
In this scenario, answers are needed concerning why some holders of very high qualifications have a relatively low economic well-being status, as indicated in the literature (Howell & Howell, 2008:536). There are people who possess very advanced qualifications, but their well-being and prosperity do not correlate to their educational level. Conversely, some people do not have any educational qualifications, but their quality of life (QoL) is better than those with advanced post-matric qualifications.

For instance, within the African setup, the attainment of true education was traditionally understood to mean the ability of a person to navigate through the various domains of life such as the economical side (for example, providing for one's family), respecting the elderly from your community (the social side), and adherence to one's culture and beliefs, among many aspects (Mararike, 2001:63). Those who have been able to achieve these qualities were happy and successful in life. However, with the growing acceptance of modernization and the hedonism it entails, the acquisition of educational qualifications has become the prevailing indicator of education.

5.1.1 Reasons for not attending an educational institution
With regards to reasons for not attending an educational institution by the sampled respondents, Table 3 indicates that the vast majority (48%) of the household heads perceived themselves to be too old to further their education. Approximately, 17% of the respondents indicated that they were too busy to attend an educational institution. Some reasons for not pursuing further education are purely affected by gender. Much of these reasons are based on family commitments and lack of funds.

Table 1 - Main reasons given by household heads for not attending an education institution

Reason for not attending an educational institution	Sex of each household head		Total
	Male	Female	
Too old	41,8%	53,3%	48,0%
Has completed education/satisfied with his/her level of education	3,8%	1,7%	2,7%
Difficulties to get to school (transport)	0,4%	0,8%	0,5%
No money for fees/text books/school uniform	10,7%	8,6%	9,5%
He or she is working at home or business/job	23,1%	11,8%	17,0%
Do not have time/too busy	2,9%	1,4%	2,1%
Family commitment (e.g. child minding, pregnancy)	2,2%	9,9%	6,3%
Education is useless or not interesting	0,3%	0,9%	0,6%
Unable to perform at school	4,6%	3,4%	3,4%
Illness/Injury	1.2%	1,3%	1,2%
other, specify	1,7%	10,1%	1,4%
Not applicable/Unspecified	7,6%	6,0%	6,8%
Total	100,0%	100,0%	100,0%

5.2 *Regression analysis*

Regression analysis was employed as a means of testing the contribution of certain socio-economic factors in determining economic well-being status (using poverty as a proxy). Using stepwise logistic regression, socio-economic factors, which were the independent variables, were regressed against the dependent variable, i.e. economic well-being status. The binary logistic regression model was used to provide an indication of the relative intensity of each independent variable in predicting economic well-being.

We restrict the analysis to the Lower Bound Poverty Line (LBPL) line, as this reflect deprivation more acutely relative to the Upper Bound Poverty Line (UBPL) measure and is by far the most commonly used poverty line in various South African studies (for example: Rogan, 2014:1348; Ardington *et al.,* 2006; Bhorat & van der Westhuizen, 2008; Hoogeveen & Özler, 2006; Leibbrandt *et al.*, 2006). But in analyses not reported here, the results generally hold when the UBPL is used. We classify an individual as poor if they belong to a household with a real monthly per capita income below a given poverty line. Though there are arguments on (especially gender-related) intra-household bargaining which suggest that household resources may not be equally shared (Iversen, 2003), we adopt the simplifying assumption that individual welfare is a function of aggregate household income, a convention not unusual in the literature (see e.g. Klasen *et al.*, 2015).

5.2.1 Treatment of data during regression analysis
In addition to the abovementioned, the study recognised that the data representing the variables to be tested were in the form of categorical data. All the independent variables as well as the dependent variable were categorical data. In entering the data into the regression models, dummy variables were created for all categorical variables. Categorical variables such as gender, employment status, educational status and poverty status were entered into the regression models dichotomously (coded 0-1) since only two categories were recognised for each of them in this study.

Education variable was categorised into three categories (less than matric, matric, post-matric) with certificate/diploma, honours combined with masters' and doctoral degrees as post-matric. Less than matric category was used as a reference group in the analysis. For better analysis and due to the small sample size of those post matric qualifications; certificate/diploma, honours, were combined with masters' and doctoral degrees as post-matric.

In the analysis age variable was treated as a continuous variable whereas marital status was categorised into six categories (married, living with partner, never married, widower, separated and divorced) with married group being our reference group in the model. Household size was categorised into four categories; namely, less than or equal to three, 4 to 6, 7 to 9 and more than 9 persons per family. A new variable, (poverty incidence) was computed and used to represent the economic well-being status variable in the regression analysis for all households in Limpopo.

5.3 *Results of the regression analysis*

The binary logistic regression was used to capture how education impacts the economic well-being status (proxied through poverty status) of the respondents in Limpopo Province. The results obtained from the binary regression analysis are presented in Table 4.

Table 4 − Binary Logistic Regression Results using 4 predictor variables

	Odds Ratio	SE	P-value	95% Confidence Interval (CI)	
				Lower	Upper
Male					
Intercept	0.0929	0.0709	0.002*	0.0207	0.4153
Age	0.9731	0.0055	0.000***	0.9623	0.9840
Marital Status					
Married	Reference				
Living with partner	10.6743	8.4351	0.003*	2.2682	50.2326
Never married	14.6438	10.6364	0.000***	3.5268	60.8024
Widower	14.3254	14.0165	0.007*	2.1050	97.4881
Separated	11.8730	10.4412	0.005*	2.1184	66.5451
Divorced	22.3180	22.1160	0.002*	3.2000	155.6516
Education					
Less than Matric	Reference				
Matric	0.3930	0.1168	0.002*	0.2194	0.7039
Post Matric	0.3754	0.1386	0.008*	0.1820	0.7742
Household Size					
Less than or equal to 3	Reference				
4 to 6	1.3399	0.2890	0.175(ns)	0.8778	2.0451
7 to 9	3.2852	1.2171	0.001**	1.5893	6.7907
More than 9	2.6634	2.0433	0.202(ns)	0.5921	11.9807
Female					
Intercept	1.2098	1.2098	0.724(ns)	.42035	3.4822
Age	0.9757	0.0045	0.000***	0.9668	0.9847
Marital Status					
Married	Reference				
Living with partner	2.2861	1.6742	0.259(ns)	0.5442	9.6041
Never married	1.3621	0.6579	0.522(ns)	0.5285	3.5105
Widower	0.1695	0.1919	0.117(ns)	0.0184	1.5602
Separated	0.8105	0.9878	0.863(ns)	0.0743	8.8330
Divorced	1.0033	0.9544	0.997(ns)	0.1554	6.4745
Education					
Less than Matric	Reference				
Matric	0.3816	0.1266	0.004*	0.1991	0.7313
Post Matric	0.1787	0.0714	0.000***	0.0816	0.3914
Household Size					
Less than or equal to 3	Reference				
4 to 6	2.6814	0.4569	0.000***	1.9200	3.7446
7 to 9	5.2151	1.8789	0.000***	2.5739	10.5667
More than 9	10.2924	8.4562	0.005*	2.0567	51.5063

*Significant at 0.05 level

The results in Table 4 provides the classification of the binary regression estimates based on the LBPL of R10 680 per annum of households under study based on the LCS data sets. The analysis focused on the set of explanatory variables that were found in the literature to have significant impact on poverty status of households in Limpopo. In order to determine the effect of the explanatory variables on the likelihood of an individual or household being poor in using the LBPL, binary logistic regression was run for the Limpopo Province data sets. It is evident that most of the explanatory variables are statistically significant at 5%, with expected signs. The theoretical deduction based on the expectation of the results suggests that, the people with lower educational attainment in Limpopo are prone to poverty incidence. This is consistent with previous research which found similar results. Wanka (2014:61-62) noted that people living in developing countries are affected by high poverty rates which makes it difficult for most citizens to advance or complete their schooling.

The overall findings indicate that the explanatory variables chosen for this study were significantly associated with lower well-being status for both males and female headed households. The findings are to a large extent in line with what has been reported in other studies. According to Nwosu and Ndinda (2018:1), female headed households are ideally associated with high poverty levels compared to their male counterparts. In the past few decades, South Africa has witnessed a sharp increase in female headed households. Buvinic and Gupta (1997) outlined three critical underlying issues that mitigate the presence of poverty incidence in female-headed households; females have significant less economic opportunities compared to men, female-headed families have a higher dependency ratio that their counterparts and lastly, a woman is more likely to be the main breadwinner in a female-headed household.

Milazzo and van de Walle (2017) in their findings reported that sub-Saharan Africa (SSA) region witnessed a sharp increase in the prevalence of female-headed households. Some of the reasons for this trend include labour migration by male heads, resulting in left-behind female heads (mostly spouses of male labour migrants), and female labour migration which results in (even if transitory) female household headship. According to Posel *et al.,* (2017:2), the vast majority of labour migration in South Africa's recent past has been men as they search for better employment opportunities whilst females predominantly remain home to take care of the family.

In terms of the control variables featured exclusively using the LBPL line, poverty incidence is significantly higher among those who are old of age, living in large household size and have low educational attainment. According to Ralston *et al.,* (2016:1), majority of South Africans who are 50 years of age and above and living in rural areas are facing complex socio-economic problems such as high poverty rates, unemployment, heath issues and low social status. The results of this research confirm this complex problem with regards to the poverty and well-being status of households in Limpopo as discussed below:

The first and significant explanatory variable under study was the educational attainment of the household head. The odds ratios on education reflects the prime role that human capital plays in determining and alleviating poverty. In fact, education is an important dimension of poverty itself, when poverty is broadly defined to include shortage of capabilities and knowledge deprivation. It has important effects on the poor children's chance to escape from poverty in their adult age and plays a catalytic role for those who are most likely to be poor.

The results showed that educational attainment (matric and post matric) of the household head is statistically associated with being poor. The odds of being a poor male with matric is 0.39 less than the odds of being a poor male with less than matric. The regression coefficient for MHHs with post matric qualification (OR=0.37) was not significantly affected by poverty incidence when compared to the reference group. Similar results are reported for FHHs whereby the regression coefficient of those with matric (OR= 0.37) were not found to be associated with poverty. Remarkably, FHHs with a post matric qualification had a very low association with poverty incidence (OR=0.17); suggesting that educated females are less prove to poverty incidence when compared with those with less than matric. These findings imply that a higher level of education provides greater opportunities for a better job and, subsequently, a higher income as depicted in the literature under section 2.5.4. The regression estimates reveal that both Male Headed Households (MHHs) and Female Headed Households (FHHs) are equally affected by poverty incidence when educational attainment is low, with men reporting only a slightly higher score. These findings confirmed the conclusions of other studies, such as Hondai *et al.* (2005) Sarwar *et al.* (2011); Bigsten *et al.* (2003) and Widyanti *et al.* (2009). More so, this finding is consistent with previous research by Wanka (2014:61-62), who found that people with lower educational attainment in Limpopo were associated with high levels of poverty. Todaro (1977) in his research contended that in developing countries (such as South Africa), high levels of poverty make it problematic for most citizens to either complete or advance their educational attainment due lack of affordability of direct and indirect costs related to schooling.

With reference to age, Table 4 reveals some important facts about household headship and poverty incidence disparities and similarities between FHHs and MHHs in South Africa when age is considered. The results show that for both genders, a one-year increase in age of the household head is associated with a higher chance of poverty incidence. The 0.97 odds ratio with regards to the age imply that both genders were significantly associated with poverty. The literature revealed that there is an upward trajectory in overall happiness and well-being as age goes up. On average, the elder generation are happier and less prone to poverty incidence than their under-educated counterparts from earlier age ages to mid-30s (Nikolav & Rusakov, 2016:826-830).

The third explanatory variable theorised to have a significant impact on poverty was the household size. Household size is a continuous variable and refers to the total number of Household members who live in the same home during the survey period for six months or more. As theoretically expected, an increase in household size is associated with poverty incidence for both MHHs and FHHs. MHHs with household size of 7 to 9 was found to have a significant (OR= 3.28) prevalence of poverty status of households in Limpopo. The odds-ratio indicated that male-headed households in this study are likely to be poor about 3.28 times when compared with the reference group (those with less than or equal to 3 members per household), which implies that male-headed households have a higher chance of being poor as household size increases. These findings support the findings reported in various past research wherein household size has been reported to have an influence on the poverty status. Endeshaw and Adugnaw (2019:32) found that household size as being positively related with poverty by assuming that family size increases, obviously the probability of having economically non-active members or children and doddering ages is higher, then household resource per head decreases.

Interestingly, FHHs with a household size of more than 9 persons had a higher chance of poverty incidence (10.29 times) when compared to those with a smaller household size.

This is significantly higher even when compared to their male counterparts. FHHs with households sized of 4 to 6 and 7 to 9 were also significantly associated with being poor with the odds ratios of 2.68 and 5.29 respectively. These findings are very crucial in a developing country like South Africa where the female headship has been on the rise in the previous three decades. The literature established that FHHs are more likely to be poor than MHHs due to them having a higher dependency ratio as compared to those headed by men. Thus, in a predominantly rural province such as Limpopo, it is expected that large households will demonstrate a higher chance of poverty incidence than those with a smaller household size.

With regards to the marital status explanatory variable; the findings of the binary logistic regression revealed that the odds of poverty incidence of unmarried (living with partner, never married, widower, separated and divorced) MHHs was more likely to be occur compared their counterparts (FHHs). More precisely, the odds ratio indicates that males living with partners are 10.67 times likely to be poor than those who are married (i.e. the reference group). The probability of divorced MHHs being poor were the highest with the odds ratio of 22.31, thereby showing that divorced males are linked to higher poverty incidence. The results in Table 4 further suggest that MHHs whose head is either unmarried or widower has a statistically significant chance of being poor (OR=14.54 & OR=14.32) when likened to those who are married.

Surprisingly, the marital status of FHHs has not been shown to have a substantial effect on poverty relative to their male counterparts. The odds ratio values of FHHs of those who are widows and separated were 0.16 and 0.81 respectively when compared to the reference group (married) whilst those were divorced recorded 1.00 odds ratio implying that they were less likely to be poor. The odds ratio of those Living with Partner were 2.2 times when compared to the reference group. It can therefore be taken that marital status of FHHs in Limpopo do not necessarily cause higher poverty incidence when compared with those who are married, more so when compared to their male counterparts. These findings hold true for many typical South African families where unmarried persons do not have the liberty to share household's expenses with their partners. The literature revealed that marital status enhanced quality of life, happiness, and less distress among spouses (Lehman *et al.*, 2016:170). Consistent with previous research, marital status has been found to play a crucial role in the financial well-being of couples (DeMaris, 2018:337).

6. Conclusions

Does educational attainment affect the economic well-being status of households? Many authors have attempted to answer this question using subjective well-being measuring methods which are generally considered very subjective and not a true reflection of poverty status. This paper adopted an objective approach to measure well-being status. Overall, determination of the association between educational attainment and well-being is a complex phenomenon. This study contributes at the same time to the literature on measuring well-being and responds to the growing field of economic development by means of highlighting the role of education in alleviating poverty within the context of a rural province of a developing country. This paper suggests a practicable way to disentangle the effects of the various socio-economic problems on poverty incidence. However, three interesting findings are drawn from the study. (1) People with lower educational attainment in Limpopo province are prone to poverty incidence. (2) Education, marital status and household size are significantly associated with lower well-being status for both males and female headed households. (3) The results show that for both genders,

a one-year increase in age of the household head is associated with a higher chance of poverty incidence.

6.1 Using recent data in future studies

Future studies on poverty alleviation and educational attainment is recommended with more up-to-date or recent data, especially considering that community surveys are amongst the most demanding type of surveys run by statistical agencies both for those implementing the survey and the households that are sampled to participate. The 2014/15 LCS datasets used in this study is the most recent data collected by Stats SA, policy-making institutions should strive and allocate budget for the collection of much more recent data.

6.2 Addressing the gap between policy and practice and addressing corruption

South Africa is not lacking in policy; the problem lies in the implementation of policies. Different policies formulated by various government structures aimed at reducing poverty as a result of low educational attainment included: The National Development Plan 2030 (NDP), Education and Capacity Development and The National Ant-Corruption Strategy 2020-2030. South Africa need to implement the objectives of the National Development Plan 2030 which entails creating a South Africa that is free from corruption, a country that values integrity, transparency and accountability, respect for the rule of law and zero tolerance to corruption. Furthermore, South Africa should also implement the findings of the National Anti-corruption Strategy 2020-2030 policy document, which is aimed at eliminating corruption from all spheres of government as well as the private sector.

6.3 Improved funding for the education sector in rural provinces

The South African government should properly fund the education sector in line with the guidelines provided by UNESCO. Notably, more funding is required to adequately equip the rural-based schools to enable them to have state of arts equipment and facilities for learning in line with the technology of the twenty-first century. Section 29 of the South African Constitution enshrines the right to education and defines the positive responsibilities of the state in this respect. Policy makers are obliged to make this a reality for all South Africans. Jiboku *et el*., (2021), reported similar findings in a study that focused on Technical and Vocational Education and Training (TVET) institutions in Nigeria.

6.4 Suggestions for future research

As this paper has shown, educational attainment is a viable strategy for South Africa to achieve much needed sustainable economic development and poverty alleviation. More scholarly attention and research could concentrate on coordination and implementation (or lack of) of policies and programs of the South African government with those of other poverty focused institutions such as the OECD including other multinational corporations which claim to be involved in poverty alleviation. The impact of these poverty intervention programmes should be thoroughly investigated and findings need to be reported in a scholarly journals and government publications.

Disclosure statement

No potential conflict of interest was reported by the authors of this research.

References

1. Badat, S., and Y. Sayed. (2014). Post-1994 South African education: The challenge of social justice. *The ANNALS of the American Academy of Political and Social Science*, 652(1), 127-148.
2. Ball, R., & Chernova, K. (2008). Absolute income, relative income and happiness. *Social Indicators Research*, 88(3), 497-529.
3. Binder, M. & Coad, A. (2011). From Average Joe's happiness to Miserable Jane and Cheerful John: using quantile regressions to analyze the full subjective well-being distribution. *Journal of Economic Behavior & Organization*, 79(3), 275– 290.
4. Bloom, D., Canning, D. & Chan, K. (2005). Higher Education and Economic Development in Africa. Washington Dc: World Bank.
5. Botha, F. & Booysen, F. (2012). The relationship between marital status and life satisfaction among South African adults. *Acta Academica*, 45(2), 150–17.
6. Cakmakyapan, S. & Goktas, A. (2013). A comparison of binary logit and probit models with a simulation study. *Journal of Social and Economic statistics*, 2(1),1-17.
7. Chen, W. (2011). How education enhances happiness: Comparison of mediating factors in four East Asian Countries. *Social Indicators Research*, 106(1), 117-131.
8. Childs, A.J. (2018). Young Australians' education and employment transitions: comparing young immigrants' well-being to their Australian peers. *Multicultural Education Review*. 10(2), 121–138.
9. Conger, R. D., Conger, K. J., & Martin, M. J. (2010). Socioeconomic status, family processes, and individual development. *Journal of Marriage and Family*, 72, 685–704.
10. Cuñado, J. & Pérez-Gracia, F. (2012). Does education affect happiness? Evidence for Spain. *Social Indicators Research*, 108(1), 185–196.
11. Demaris, A. (2018). Marriage Advantage in Subjective Well-Being: Causal Effect or Unmeasured Heterogeneity, *Marriage & Family Review*, 54(4), 335-350.
12. Diener, E. & Biswas-Diener, R. (2002). Will Money Increase Subjective Well-Being?. *Social Indicators Research,* 57(2), 119–169.
13. Easterlin, RA. (1974). Does Economic growth improve human a lot?. Some empirical evidence. *Academic press*, 89-125.
14. Endeshaw, M. & Adugnaw, Z. (2019). Assessment of the Determinants of Urban Household Household Poverty in North Shewa Zone, Ethiopia: Evidence from Debre Berhan Town. *Journal of Poverty, Investment and Development*, 50(1), 21-43.
15. Field. A. (2012). *Discovering Statistics Using IBM SPSS Statistics*. California : Sage Publications.
16. Gebresilassie, Y.H. (2014). The economic impact of productive safety net program on poverty: evidence from central zone of Tigray National Regional State, Ethiopia. *International Journal of Economic Behavior*, 3(4), 426-436.
17. Geda, A., De Jong, N., Kimenyi, M.S., & Mwabu G. (2005). Determinants of poverty in Kenya: a household level analysis. *Economics working papers*, 347, 1-20.
18. Hoogeveen, J. G. & Özler, B. (2006). Poverty and inequality in post-apartheid South Africa:1995–2000. In BHORAT, H. & KANBUR, R. (ed.), Poverty and Policy in Post-Apartheid South Africa. Cape Town: *Human Sciences Research Council*: 59-94.
19. Howell, R. T., & Howell, C.J. (2008). The relation of economic status to subjective well-being in developing countries: A meta-analysis. *Psychological Bulletin*, 134(4), 536–560
20. Index Mundi. (2015). *South Africa Age Structure*. Retrieved from http://www.indexmundi.com/southafrica/age_structure.html.

21. Jiboku, J.O., Jiboku, P.A. & Babasanya, A.O. (2021). Poverty and Unemployment in Nigeria: The case for advancement of Technical Vocational Education and Training (TVET). *International Journal of Economic Behavior* (IJEB), 11(1), 57-77.

22. Kahneman, D. & Krueger, A.B. 2006. Developments in the measurement of subjective well-being. *Journal of Economic perspectives*, 20(1), 3-24.

23. Kleinbaum, D.G. & Klein, M. (2010). *Logistic Regression: A self-learning text*. New York: Springer.

24. Kushlev, K., Dunn, E.W. & Lucas, R.E. (2015). Higher income is associated with less daily sadness but not more daily happiness. *Social Psychological and Personality Science,* 6(5), 483-489.

25. Lehmann, V, Tuinman, M.A., Braeken, J., Vingerhoets, A.J.J.M., Sanderman, R. & Hagedoorn, M. (2015). Satisfaction with Relationship Status: Development of a New Scale and the Role in Predicting Well-Being. *Journal of Happiness*, 16(15), 169–184.

26. Lester, A., Nel, E.L. & Binns, T. (2000). *South Africa, Past, Present and Future: Gold at the End of the Rainbow?*. New York: Routledge.

27. Mararike, C.G. (2001). *Africa's Heritage: Our rallying Point: The Case of Zimbabwe's Land Issue*. Harare: Best Practices Books.

28. Michael, A., Tashikalma, A.K., Maurice, D.C. & Tafida, A.A., (2019). Analysis of multidimensional poverty in rural Adamawa State, Nigeria. *Journal of Agribusiness and Rural Development*, 53(3), 233-241.

29. Morris, M. (2018). *South Africa's deficient education system (News24)*. Retrieved from https://www.news24.com/Analysis/south-africas-deficient-education-system-20180507

30. Naveed, A., & Sutoris, P. (2020). *Poverty and Education in South Asia*. In: Sarangapani P., Pappu R. (eds) Handbook of Education Systems in South Asia. Global Education Systems. Singapore: Springer.

31. Nwosu, C. & Ndinda, C. (2018). Female household headship and poverty in South Africa: an employment-based analysis. *Working Paper*

32. Organisation For Economic Development. (2016). *Society at a Glance 2016: OECD Social Indicators*, Paris: OECD Publishing.

33. Palmer, R., R. Wedgwood, R. Hayman, K. King, & K. Thin. (2007). Educating out of Poverty? A Synthesis Report on Ghana, India, Kenya, Rwanda, Tanzania and South Africa. *Researching the Issues,* 70, 5–102.

34. Perret, S. (2004). *Matching policies on rural development and local governance in South Africa: recent history, principles and current challenges*. GTZ workshop on Local Governance and Rural Development. University of Limpopo: South Africa.

35. Posel, D., Fairburn, J.A. & Lund, F. (2006). Labour migration and households: A reconsideration of the effects of the social pension on labour supply in South Africa. *Economic modelling*, 23(5), 836-853.

36. Rhodes, B. & Mckenzie, T. (2018). To what extent does socio-economic status still affect household access to water and sanitation services in South Africa?. *Journal of Economic and Financial Sciences*, 11(1), 1-9.

37. Schotte, S., Zizzamia, R. & Leibbrandt, M. (2017). *Social stratification, life chances and vulnerability to poverty in South Africa. South African Development and Research Unit* . Retrieved from: http://opensaldru.uct.ac.za/bitstream.

38. Schuster, J. (2011). The same education for all? The South African school system 17 years after the end of apartheid. *Kas International Reports*, 7, 40-56.

39. Statistics South Africa. (2015). *Unemployment increases in the third quarter of 2015*. Retrieved from: http://www.statssa.gov.za/?p=12948

40. Statistics South Africa. (2016). The state of basic service delivery in South Africa: In-depth analysis of the Community Survey 2016 data. Retrieved from: http://www.statssa.gov.za/publications/Report%2003-01-22/Report%222016.pdf
41. Statistics South Africa. (2017). Living Conditions of Households in South Africa. An analysis of household expenditure and income. Retrieved from: http://www.statssa.gov.za/publications/P0310/P03102014.pdf
42. Thomson, A. (2008). Exploring the Relationship Between Higher Education and Development: A Review and Report. Guerrand Hermes Foundation for Peace. Retrieved from: http://www.ghfp.org/Portals/0/documents/Thomson_HEI_Role.pdf
43. Todaro, M. P. (1977). *Economics for a developing world: an introduction to principles, problems and policies for development*. London: Longman Press.
44. Vally, S. (2004). *Citizenship and Children's Education Rights in South Africa'*, Education Policy Unit Paper, University of the Witwatersrand.
45. Wanka, F. (2014). *The impact of educational attainment on household poverty in South Africa: A case study of Limpopo Province.* Master of Economics. Dissertation, University of the Western Cape. South Africa.
46. Webster, D., Dunne, L. and Hunter, R. (2021). Association between social networks and subjective well-being in adolescents: A systematic review. *Youth & Society*, 53(2), 175-210.
47. Zwane, T.T. (2020). The causal effect of education on earnings in urban and rural South Africa: A further update. *Demography and social economy*, 39(1), 79-94.