Original Research Article

Household poverty levels in Namibia and their associated sociodemographic factors: An empirical investigation of the 2015/16 Namibia household income and expenditure survey

Opeoluwa Oyedele[1*]

[1]Department of Computing, Mathematical & Statistical Sciences, University of Namibia, Windhoek, Namibia
*Corresponding author: OpeoluwaOyedele@gmail.com

ABSTRACT

Despite the intervention strategies that have been put in place to fight poverty, Namibia continues to experience prevalence of poverty with large numbers of households still living in poverty conditions and unable to afford the minimum daily essentials for a decent life. In this quantitative cross-sectional study design, the impact of sociodemographic characteristics of households on their poverty levels was statistically analysed using an ordered probit regression on data from the 2015/16 Namibia household income and expenditure survey. Results showed that sociodemographic characteristics such as the types of household dwelling unit, highest education attainment of the head of household, household main language, household tenure and household main source of income had a significant impact on the household's poverty levels. Households living in a mobile home dwelling unit, whose heads had secondary education as their highest educational attainment as well as households that were mortgaged and whose main source of income were from other sources were less likely to be severely household poor and more likely to be household poor. Furthermore, households living in a single-quarters dwelling unit and whose main language were Setswana were more likely to be severely household poor and less likely to be household poor. It is therefore recommended that the Namibian government and policy makers put more efforts in improving the sociodemographic characteristics of households, particularly those living in a single quarter dwelling unit and whose main language were Setswana.

1. Introduction

Household poverty is a state in which a household lacks the adequate financial, physical and social resources necessary for a (minimum) standard of living acceptable within the society in which the household lives (Maslen et al., 2013). According to the 2016 World Bank Annual report, household poverty has been a widespread recurrent challenge in Africa and Namibia is not excluded from this challenge. Using the international poverty line of US$1 per person per day, this report showed that Sub-Saharan Africa had the highest ratio (close to 50%) among all world regions. Here, poverty line was defined as the level of income or expenditure required by an individual to purchase or satisfy a minimum basket of consumption goods and services for him/her not to be in poverty (Chaudhry, Malik & Hassan, 2009). In Namibia, the upper bound poverty line estimated at N$520.80 was defined as households/persons that are considered to be poor while

the lower bound poverty line estimated at N$389.30 was defined as households/persons that are food-poor since their total consumption expenditures are insufficient to meet their daily survival requirement (Namibia Statistics Agency, 2018).

Over the years, several studies have been done on poverty in general and its contributing factors globally, with factors such as education, migration, source of income, employment status, household indebtedness and marital status identified as the significant ones (Bulatao & Anderson, 2004; Wan, 2010; Hartfree & Collard, 2014; Yang, 2014; Mupetesi et al., 2015; Devaraj, 2017; Biyase & Zwane, 2018; Omoniyi, 2018; Trading Economics, 2020). Although there are policies and intervention strategies put in place by some institutions to reduce household poverty in societies, many countries, including Namibia, continue to experience high prevalence of household poverty. In the 2015/16 Namibia household income and expenditure

survey report by Namibia Statistics Agency (2018), each household was classified as poor or severely poor based on their costs of basic needs compared to the national poverty lines. Here, severe poverty was defined as a condition characterized by severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter, education and information.

As an educated nation with vast natural resources and an approximated population size of 2.5 million people, 28% of households in Namibia were classified as poor in 2004 and this figure decreased to 17% in 2016, while 14% and 11% of the households were classified as severely poor in 2004 and 2016 respectively (Namibia Statistics Agency, 2021). Notwithstanding, the incidence of poverty in Namibia stands at 43.3% with an average intensity value of 44.0%. This loosely means that poor people in Namibia experience 44.0% of weighted deprivations such as education, health and living standards (Namibia Statistics Agency, 2021). For this reason, the aim of this study was to examine the sociodemographic factors contributing to household poverty levels in Namibia. Findings from this study may provide further assist in the development of policy recommendations that can guide relevant organizations and governmental ministries to examine ways of re-allocating resources for the reduction of household poverty in the country.

2. Methodology

The data used in this study were extracted from the 2015/16 Namibia household income and expenditure survey (the latest thus far in the country) obtained from the Namibia Statistics Agency. This survey data is freely available to the public on the agency's website at www.nsa.org.na. All households with incomplete, non-response or missing information were excluded from this study.

2.1 Data Analysis

Consider a set of centred predictor variables $\mathbf{X}: N \times P$ and a set of centred response variable $\mathbf{y}: N \times 1$, regression analysis measures the effect of $\mathbf{X}$ on $\mathbf{y}$ via the linear equation model

$$\mathbf{y} = \mathbf{Xb} + \mathbf{e}, \qquad (1)$$

where $\mathbf{e}: N \times 1$ is the error term and $\mathbf{b}: P \times 1$ is the unknown (regression) coefficient vector estimated through the least squares method as

$$\hat{\mathbf{b}} = (\mathbf{X^T X})^{-1} \mathbf{X^T y}. \qquad (2)$$

Here, equation (1) assumes that $\mathbf{y}$ is a continuous variable and follows a normal distribution with mean μ and constant variance σ^2 (Oyedele & Ntusi, 2021).

More often $\mathbf{y}$ is dichotomous or binary in nature and non-normally distributed. In such situation, the modelling of $\mathbf{y}$ can be done through the usage of generalized linear models such as the probit model (Oyedele & Lubbe, 2018). However, for a non-binary $\mathbf{y}$ with at least 2 ordered categories, an ordered probit model is more appropriate. Consider $\mathbf{y}$ with $M > 1$ ordered categories. The ordered probit model for Y_n, with $n = 1,2,\cdots,N$, can be obtained as

$$Y_n^* = \mathbf{Xb} + \mathbf{e} \qquad (3)$$

where

$$y_n = \begin{cases} 1 & y_n^* \le \mu_1 \\ 2 & \mu_1 < y_n^* \le \mu_2 \\ 3 & \mu_2 < y_n^* \le \mu_3 \\ \vdots & \vdots \\ M & \mu_{M-1} < y_n^* \end{cases}$$

(Della-Lucia et al., 2013).

The predictor variables in this study were the sociodemographic characteristics (age of head, types of dwelling unit, composition, size, tenure, highest education of head, land ownership, main source of income, main language, region, sex of head and location) of the households, while the response variable was the households' poverty levels. In addition, the household poverty levels were determined using the Namibia Statistics Agency (2018) poverty line estimated at N\$293.10 (per month), with a lower and upper bound estimate of N\$389.30 and N\$520.80 respectively. Each household was classified into three categories, namely poor (if spending is N\$389.30 - N\$520.80), severely poor (if spending is < N\$389.30) and not poor (if spending is > N\$520.81). All data analysis aspects of this study were performed using the R programming language (version 4.1.2).

3. Results

As per the inclusive criteria of this study, a total of 22,026 households were considered. To identify the best fit model to use in identifying the impact of sociodemographic characteristics of households on their poverty levels, all the predictor variables were used in model I. Afterwards, all the significant (explanatory) variables from model I were later used as (explanatory) variables in model II, and then the resulting significant variables from model II were used as variables in model III. This continued until there were no more significant variables left to use. The best fit model was identified as model I because it had the lowest Akaike information criterion value of 4969.305

and highest log-likelihood value of -2415.652. The resulting output of model I is shown in Table 1.

From Table 1, with a significant probability value (p-value) at a 5% level of significance, sociodemographic characteristics such as the types of household dwelling unit, highest education attainment of the head of household, household main language, as well as household tenure and household main source of income at a 10% level of significance, can be concluded to have a significant impact on the household poverty levels.

Table 1: Output from the fitted ordered probit model

	Estimate (adjusted)	Standard error	P-value
Age of household head	-0.002	0.002	0.135
Types of household dwelling unit			
Semi-detached house/Town house	-0.021	0.116	0.856
Apartment	-0.529	0.367	0.149
Guest flat	-0.163	0.416	0.695
Part commercial/Industrial building	-0.855	0.399	0.032*
Mobile home (caravan/tent)	-1.172	0.593	0.048*
Single quarters	0.400	0.192	0.037*
Traditional dwelling	-0.092	0.071	0.196
Improvised housing unit	-0.081	0.070	0.249
Others	-0.395	0.353	0.262
Detached house (Ref)			
Household composition			
With head and spouse(s) only	0.023	0.115	0.839
With 1 child, no relatives/non-relatives	0.086	0.091	0.345
With 2+ children, no relatives/non-relatives	-0.043	0.083	0.602
With relatives, no non-relatives	-0.063	0.076	0.412
With domestic worker(s)	0.155	0.148	0.296
With non-relatives	-0.144	0.095	0.130
With head alone (Ref)			
Household size	0.002	0.009	0.852
Household tenure			
Owned with mortgage	-0.172	0.097	0.075**
Not stated (Ref)			
Highest education of household head			
Primary	-0.049	0.056	0.387
Secondary	-0.169	0.062	0.006*
Tertiary	-0.141	0.097	0.146
Not stated	-0.246	0.241	0.306
No formal education (Ref)			
Household land ownership			
No	0.017	0.046	0.715
Yes (Ref)			
Household main source of income			
Subsistence farming	-0.022	0.072	0.761
Commercial farming	-0.110	0.276	0.691
Business activities, non-farming	0.105	0.073	0.151
Employment and/or annuity funds pensions	0.061	0.186	0.743
Cash remittances (exclude alimony/child support)	-0.089	0.088	0.311
Rental money	0.203	0.289	0.483
Interest from savings/investments	-0.161	0.540	0.765
State old age pension	-0.008	0.077	0.916
War veterans/ex-combatants grant	-0.054	0.238	0.820
Disability grants for adults (over 16 years)	0.086	0.151	0.570
State child maintenance grants	0.173	0.177	0.327
State foster care grants	0.007	0.353	0.984
State special maintenance grants (disability under 16 years)	-0.158	0.645	0.806
Alimony and similar allowances	0.019	0.420	0.965
Drought relief assistance	-0.032	0.153	0.834
In-kind receipts	-0.007	0.146	0.960
Other sources	-0.291	0.162	0.072**
Salaries & wages (Ref)			
Household main language			
Zambezi languages	-0.198	0.235	0.398
Otjiherero	0.114	0.183	0.534
Rukavango	-0.185	0.189	0.327
Nama/Damara	0.085	0.184	0.643

Oshiwambo	-0.008	0.183	0.964
Setswana	0.748	0.338	0.027*
Afrikaans	0.111	0.203	0.584
German	0.327	0.386	0.397
English	0.112	0.322	0.729
Other European	-0.779	0.551	0.157
Other African	0.090	0.305	0.766
Others	-0.021	0.252	0.934
Khoisan (Ref)			
Region			
Erongo	0.116	0.130	0.371
Hardap	-0.074	0.131	0.573
Kavango East	0.082	0.164	0.618
Kavango West	0.130	0.167	0.437
Khomas	-0.099	0.128	0.436
Kunene	0.161	0.144	0.264
Ohangwena	-0.117	0.136	0.390
Omaheke	0.107	0.135	0.428
Omusati	-0.075	0.137	0.586
Oshana	-0.032	0.135	0.811
Oshikoto	-0.057	0.134	0.669
Otjozondjupa	0.193	0.130	0.138
Zambezi	0.195	0.203	0.336
!Karas (Ref)			
Sex of household head			
Male	-0.028	0.042	0.506
Female (Ref)			
Household location			
Rural	0.007	0.063	0.910
Urban (Ref)			
Household poor | Not Household poor	-2.164	0.237	<0.001*
Not Household poor | Severely Household poor	1.270	0.235	<0.001*

(Ref) = Reference category,
*Significant at a 5% level of significance,
**Significant at a 10% level of significance

Furthermore, at a 5% level of significance and keeping all other variables constant, households living in a part commercial/industrial building (p-value=0.032) and in a mobile home (p-value=0.048) dwelling units were significantly and negatively associated with household poverty levels, suggesting that households who were living in these dwelling units were less likely to be severely household poor and more likely to be household poor as shown in Table 1. On the other hand, households living in a single quarter dwelling unit (p-value=0.037) and whose main language was Setswana (p-value=0.027) were significantly and positively associated with household poverty levels, suggesting that households who were living in this dwelling unit and spoke Setswana were more likely to be severely household poor and less likely to be household poor.

Moreover, households whose heads had secondary education (p-value=0.006) as their highest educational attainment were significantly and negatively associated with household poverty levels, suggesting that these households were less likely to be severely household poor and more likely to be household poor. Although at a 10% level of significance, mortgaged households (p-value=0.075) and those whose had other sources of main income (p-value=0.072) were significantly and negatively associated with household poverty levels, suggesting that these households were less likely to be severely household poor and more likely to be household poor as shown in Table 1.

4. Discussion

In this study, the ordered probit modelling technique was used to statistically examine the sociodemographic factors contributing to household poverty levels in Namibia using data obtained from the 2015/16 Namibia household income and expenditure survey.

Sociodemographic characteristics such as the types of household dwelling unit, highest education attainment of the head of household, household main language, household tenure and household main source of income had a significant impact on the household's poverty levels. These findings are similar to those found in Chaudhry et al. (2009), Wan (2010), Mupetesi et al. (2015) and Biyase & Zwane (2018). Mupetesi et al. (2015) concluded that the higher the crop production for households whose source of income were from other sources such as staple maize crop farming, the better improved their household poverty levels, while Wan (2010) concluded that as the

number of years of education increases, the proportionate number of persons living below the poverty line decreases. In addition, Biyase & Zwane (2018) concluded that households living in urban type of dwelling units were less likely to be poverty stricken compared to those in the traditional/rural types.

Furthermore, households living in a part commercial/industrial building dwelling unit, living in a mobile home dwelling unit, whose heads had secondary education as their highest educational attainment as well as households that were mortgaged and whose main source of income were from other sources were less likely to be severely household poor and more likely to be household poor. Moreover, households living in a single quarter dwelling unit and whose main language were Setswana were more likely to be severely household poor and less likely to be household poor. This study findings are not startling, since most potential employers in Namibia require a higher or specific class of qualifications from their employees and new potential job candidates, while having higher education attainment can serve as an investment that improves the economic worth of individuals which in turns can lower the likelihood of such individuals living in severe poverty. Also, quite a lot of households in Namibia have at least six living-in members to cater for, which requires more cost on food & essential services on a daily basis. As a result of such financial burden to bear on a daily basis, household heads or breadwinners are driven to obtain loans and/or mortgage their homes for the upkeep of their households, in addition to their household income, thereby increasing their likelihood of living in poverty. Additionally, households whose main language were not English or any of the country's official language(s) tend to experience the highest incidence, depth and severity of poverty. This can be due to the fact that a lot of employers in the non-profit institutions, parastatals, government institutions and privately-owned enterprises require their employees and new applicants to be well conversant in internationally-friendly languages such as English, Afrikaans, German, Chinese and French.

5. Conclusions

With sociodemographic characteristics such as the types of household dwelling unit, highest education attainment of the head of household, household main language, household tenure and household main source of income having a significant impact on the household's poverty levels, it is therefore recommended that the Namibian government and policy makers put more efforts in improving the sociodemographic characteristics of households, particularly those living in a single quarters dwelling unit and whose main language were Setswana. Additionally, relevant organizations and governmental ministries in Namibia should continue to strengthen the national poverty eradication measures to achieve the national objectives as set out in the United Nations' sustainable development goals 1-6 and 8, and as per the national development plans. Further studies on this topic is recommended with a multidimensional household poverty definition using the next Namibia household income and expenditure survey tentatively planned for 2022/23 that would be incorporating a multidimensional poverty concept.

Conflicts of interest
The author of this paper has no competing interests to declare.

References

Biyase, M. & Zwane, T. (2018). An Empirical Analysis of the Determinants of Poverty and Household Welfare in South Africa. The Journal of Developing Areas, 52(1), 116 -130.

Bulatao, R., & Anderson, N. (2004). Understanding Racial and Ethnic Differences in Health in Late Life: A Research Agenda of the National Research Council Panel on Race, Ethnicity, and Health in Later Life. National Academies Press. Washington, D.C.

Chaudhry, I., Malik, S., & Hassan, A. (2009). The Impact of Socioeconomic and Demographic Variables on Poverty: A Village Study. The Lahore Journal of Economics, 14 (1), 39-68.

Della-Lucia, S.M., Minim, V.P.R., Silva, C.H.O., Minim, L.A., & Cipriano, P.D. (2013). Ordered Probit Regression Analysis of The Effect of Brand Name on Beer Acceptance by Consumers. Food Science and Technology, 33(3), 586-591.

Devaraj, T. (2017). Impact of Poverty on School Children in Malawi. International Journal of Business and Economics Research, 3(3), 328-332.

Hartfree, Y. & Collard, S. (2014). Poverty, Debt and Credit: An Expert-Led Review. Personal Finance Research Centre, University of Bristol.

Maslen, C., Raffle, A., Marriott, S. & Smith, N. (2013). Food Poverty Report: What Does the Evidence Tell Us? Bristol City Council for Bristol's Food Policy Council.

Mupetesi, T., Francis, J., & Gomo, R. (2015). Poverty Rates in a Rural District of Zimbabwe: A Case Study of the Guruve District. Journal of Social Sciences, 43(1), 25-37.

Namibia Statistics Agency (2018). Namibia Household Income and Expenditure Survey 2015/2016 Report. Ongwediva.

Namibia Statistics Agency (2021). Namibia Multidimensional Poverty Index (MPI) Report 2021. Windhoek.

Omoniyi, B. (2018). An Examination of the Causes of Poverty on Economic Growth in Nigeria. Africa's Public Service Delivery and Performance Review, 6(1).

Oyedele, O.F & Lubbe, S. (2018). Partial Least Squares Biplot for Generalized Linear Models. International Journal of Statistics: Advances in Theory and Applications, 2(1), 1-20.

Oyedele, O.F. & Ntusi, N.S. (2021). A Multinomial Modelling of the Factors that Impact Viral Load Levels in Adults on Anti-Retroviral Therapy in Namibia: A Case Study of Nankudu Health District. International Science and Technology Journal of Namibia, 14, 73-82.

Trading Economics (2020). Namibia Youth Unemployment Rate 2012-2018. Retrieved from https://tradingeconomics.com/namibia/youth-unemployment-rate. (Accessed on July 10, 2021).

Wan, T. (2010). Effects of Social and Demographic Factors on Poverty Among Adult Males In The USA. Department of Sociology and International Population Program, Cornell University, New York. Retrieved from https://ejournals.epublishing.ekt.gr/index.php/ekke/article/viewFile/6935/6655.pdf. (Accessed on July 10, 2021).

World Bank (2016). World Bank Annual Report 2016 (English). Washington, D.C.: World Bank Group. Retrieved from http://documents.worldbank.org/curated/en/763601475489253430/World-Bank-annual-report-2016. (Accessed on July 10, 2021).

Yang, R. (2014). The Determinants of Poverty and Vulnerability in Small-Scale Fisheries Communities in Vietnam. MA. Thesis, University of Ottawa.