

Logistic Regression Model For Life Style Of Retired Civil Servants In Kano State (Nigeria)

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Abstract: This study tries to find the causes of stresses and the lifestyle status of the retired civil servants after retirement in Kano State. And for this study the method of stratified sampling was used to select the samples for the study. And the sample of size 153 was selected and they were administered by a questionnaire, but finally only 141 were retrieved from the selected respondents. And it has been found that, the results of binary logistic regression analysis of significant studied factors for better lifestyle of retired civil servants in Kano state. 14 Independent categorical variables are included in the model to find the significant ones among them. We consider the two categories of better lifestyle as yes for better lifestyle (code 1) and no for not having better lifestyle (code 0). Different socio-demographic and economic characteristics are included as independent variables in the binary logistic regression model. Finally, the two independent variables Highest position held while in service, and the Nature of retirements were found statistically significant for better lifestyle of the retired civil servants in Kano States at $p < 0.01$ and $p < 0.05$ respectively. Odds for experiencing a better lifestyle after retirements for Senior employees is 1.88 times higher better lifestyle compare to the reference Category (ie Managerial employees Category). And also the Odds of having a better lifestyle for the Junior employee Category is 0.124 lower than the Reference Category (Managerial Category). Odds for experiencing better lifestyle for those who retired after reaching a statutory age of retirement is 0.67 times higher than those in the reference category (ie Those who retired Voluntarily). And the Odds for having Better lifestyle for those who did Compulsory retirement is also 0.293 lower than those who retired Voluntarily. That means reaching high position in service brings a better life style after retirement for the civil servants in Kano State.

Keywords: Civil servants, Lifestyle, Retirement

0 Introduction

Life comes in stages and each stage of life throws up its own challenges and opportunities and among this stage of life is the retirement phase which comes after one has actively engaged his time in work as an employee over a period of time. Biblical records show that “to everything there is a season, and a time for every purpose under the heaven. Retirement is a necessary end which every worker must anticipate, whether in the public sector or in the private sector (Onoyas, 2013). Denga (2010) asserted that retirement is the longest vacation and it is a pleasurable experience while Akinboye (2004) stated that retirement is a process in which an individual disengages from routine work performance and this could be voluntary, mandatory or compulsory. Work is a basic need for human existence. Work is the means by which an individual can accomplish self improvement either materially, intellectually or physically. Retirement simply refers to a situation where an individual is formally or officially stopped from active work role and it is often perceived as the realization of a life goal. It represents one of the happiest time of one’s life. It is a mark of honors and appreciation from one’s employer. Hence, workers are often rewarded with gratuity and other retirement benefits. Retirement has become an old practice in both private and public service in Nigeria. Osuala (1985) noted that retirement is a major stage in adult development and it essentially marks the split from middle years to old age. Post retirement life is not devoid of stress. Retirees face a lot of challenges especially in the management of the non-contributory pension regime established by Act 102 of 1979 in Nigeria. The 2004 Pension Reform Act was introduced as alternative to these challenges Oshiomole, A. (2009). This

study underscored the intricacies inherent in retirement stress and their coping strategies among retired civil servants in Kano State Nigeria. The study population was retired civil servants.

1.0 Methodology

The research design adopted for this study is the descriptive survey method. The design was used because it would allow the researcher to obtain factual information which will be a fair representation of the perceptions of the retired civil servants in Kano state about their lifestyle and stress being experienced by them after retirement. The population for the study is all retired civil servants in Kano state. But the sample was made up of 153 retired civil servants both male and female randomly selected from Pension Board office Kano. The instrument used for data collection is a researcher-developed questionnaire titled “A Study on Lifestyle of Civil Servants After Retirement in Kano State. The instrument was validated by giving it to experts in the field of guidance and counseling for vetting. Based on their suggestions, the initial draft was modified for suitability. The modified copy was administered twice to 20 selected retired teachers in Nassarawa Local Government Area Kano. The coefficient of 0.76 obtained was deemed high enough to justify the usage of the questionnaire for the study.

1.0.1 Sampling Design and Sample Size

For this research the method of Stratified Random Sampling was adopted. And the stratification process possesses the following features;

- i) The entire population is divided into several distinct sub populations, called strata.

- ii) Within each stratum, a separate and independent sample is selected.
- iii) For each individual stratum mean, proportion, variance and other statistics are computed.
- iv) These estimates are then properly weighted to form a combined estimates for the entire population.

In these research the whole population (ie the list of all retired civil servants in Kano State) were sub divided in to three distinct sub populations as follows;

Stratum I; Those that have retired in the last five years or less.

Stratum II; Those that have retired within six to Ten years.

Stratum III; Those that have retired in the last eleven years and above.

And the following formula was used to calculate the estimated sample size;

$$n = \frac{Z_{\alpha/2}^2 p(1-p)}{m^2} \dots\dots\dots(1)$$

Where n=sample size, $Z_{\alpha/2}=1.96$ (for 95% confidence)= value from standard normal distributions corresponding to desired confidence level. ($p= 0.89$) from the previous study (Ajayi et al., 2014)and the margin of error , which was set at $m = 0.05$ in this research. And due to the expected non response the sample size have been adjusted to 153.

2.1.1 Variables Used For This Study

The following are the selected variables for this research with an intension to achieve the stated aims and objectives of the study; Independent Variables are, Age group , Gender, Location of the respondents Educational Qualification, Profession while in active service, Highest position held while in service, Grade level, Years in service before retirement,Nature of retirement, Are you working?, Marital status, No. of children, type of support, Do you consider yourself over weight?, healthy diet, eating behavior, Do have any other Diseases?, attending seminar on how to manage yourself after retirements. While the dependent Variable for this research work was, Lifestyle scores of the respondents.

3.0 The Logistic Regression Model

A natural choice for $E(y)$ would be the cumulative distribution function of a random variable. In particular,the logistic distribution, whose cumulative distribution function is the simplified logistic function yields a good link and is given by

$$E(y) = \frac{\exp(y)}{1 + \exp(y)} = \frac{\exp(\hat{x}\beta)}{1 + \exp(\hat{x}\beta)} = \frac{1}{1 + \exp(-\hat{x}\beta)}$$

Linear predictor and link functions:

The systematic component in $E(y)$ is the linear predictor and is denoted as

$$\eta_i = \sum_j \beta_j x_{ij} = x_i \beta, i = 1,2, \dots, n, j = 0,1,2, \dots, k.$$

The link function in generalized linear model relates the linear predictor η_i , to the mean response μ_i . Thus

$$g(\mu_i) = \eta_i \text{ or } \mu_i = g^{-1}(\eta_i)$$

3.0.1 Binary Logistic Regression

Binary Logistic regression is a prognostic model that is fitted where there is a dichotomous/binary dependent variable like in this instance where the researcher is interested in whether there was an increase in stock price or not. Usually, the categories are coded as "0" and "1" as it results is a straightforward interpretation. Normally the category of interest also affectionately referred to the case is typically coded as "1" and the other group is also known as a "non case" as "0".

3.1.1 General Logistic Regression Model

The formula for a logistic regression model is given by;

$$\pi(x_i) = P(y_i = 1 : x_i)$$

$$= [1 + \exp(-X^T \beta)]^{-1}$$

$$X^T \beta = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_{p-1} x_{p-1}$$

$$\beta_{p \times 1} = \begin{bmatrix} \beta_0 \\ \beta_1 \\ \vdots \\ \beta_{p-1} \end{bmatrix}, X_{p \times 1} = \begin{bmatrix} 1 \\ X_1 \\ \vdots \\ X_{p-1} \end{bmatrix}, X_{i \times 1} = \begin{bmatrix} 1 \\ X_{i1} \\ \vdots \\ X_{i,p-1} \end{bmatrix}$$

x_1, x_2, \dots, x_k are the independent variables.

β_0 is the coefficient of the constant term

$\beta_1, \beta_2, \dots, \beta_{p-1}$ are the coefficients of the p independent variables

$\pi(x_i)$ is the probability of an event that depends on p-independent variables.

$$\text{Since } \pi(x_i) = [1 + \exp(-X^T \beta)]^{-1}$$

$$= \frac{1}{1 + \exp(-X^T \beta)}$$

$$\Rightarrow 1 - \pi(x_i) = 1 - \frac{1}{1 + \exp(-X\beta)}$$

$$= \frac{[1 + \exp(-X^T \beta)] - 1}{1 + \exp(-X^T \beta)}$$

$$= \frac{\exp(-X^T \beta)}{1 + \exp(-X^T \beta)}$$

$$\Rightarrow \frac{\pi(x_i)}{1 - \pi(x_i)} = [\exp(-X^T \beta)]^{-1}$$

$$\text{Thus, } \ln\left(\frac{\pi(x_i)}{1 - \pi(x_i)}\right) = \text{logit}[\pi(x_i)]$$

$$= X^T \beta \dots\dots\dots(4)$$

Logistic regression quantifies the relationship between the dichotomous dependent variable and the predictors using

odds ratios. Odds ratio is the probability that an event will occur divided by the probability that the event will not happen.

2.1 Results and discussions

Table 3.0: Percentage distribution of different socio-economic and demographic characteristics of Retired civil servants in Kano State

Characteristics	Category	No.	%
Age of respondent	50-54 years	48	34.0
	55-59 years	37	26.2
	60-64 years	38	27.0
	65 & above years	18	12.8
Gender of respondent	Male	94	66.7
	Female	47	33.3
Education level of respondent	PSC	4	2.8
	SSC	34	24.1
	DSC	45	31.9
	HD	37	26.2
	Postgraduate	7	5.0
	Masters/Phd	14	9.9
Profession of respondent	Teaching	43	30.5
	Lecturing	20	14.2
	Medical/Paramedical	13	9.2
	Law enforcement agent	9	6.4
	Administration	56	39.7
Highest position held during service	Junior employee	53	37.6
	Senior employee	71	50.4
	Managerial employee	17	12.1
Grade Level	03-06	45	31.9
	07-10	34	24.1
	11-13	36	25.5
	14 & above	26	18.4
Years in service before retirement	Less than 10	7	5.0
	11-20	33	23.4
	21-30	50	35.5
	31-35	51	36.2
Nature of retirement	Voluntary	46	32.6
	Compulsory	27	19.1
	Statutory	68	48.2
Self employed	Yes	55	39.0

Marital Status	No	85	60.3
	Contract	1	0.7
	Single	2	1.4
	Married	115	81.6
	Divorced	12	8.5
No. of children	Widow	12	8.5
	None	1	0.7
	1-5	36	25.5
	6-10	66	46.8
	11-15	29	20.6
Location of Residence	15 & above	9	6.4
	Rural	73	51.8
	Urban	68	48.2

Table 3.0 showed the socio economic and demographic status of the respondents, it indicate that , by age distribution of the respondents, those aged between 50-54years are 34%, while those aged between 55-59years are 26.2%,60-64years 27%, and 65 above 12.8%. Also, the gender distribution of the respondents shows that the number of male respondents of retired civil servants is exactly double of the female respondents stood at 66.7% and 33.3% respectively. Meanwhile, the distribution of the education level of the respondents, those with only Primary certificates are 2.8% , this shows that most of the respondents have at least Secondary school certificate and above having fairly the highest percentage of 97.2%. As for the profession distribution of the respondents, those who retired as teachers are 30.5%, Lecturers 14.2%, Medical/Paramedical workers 9.2%, while the law enforcements agents among them were 6.4%, the majority come from the administrators as they are 39.7%. For the distribution of the highest position held by the respondents during service, those that have retired as junior employees are 37.6%, while those that are senior employees are 50.4%, and the percentage of those who rose up to managerial positions are only 12%.It follows that for the grade level of or level service, those that have retired at grade level within the range 03-06 are 31.9%, 07-10, 24.1%, 11-13 25.5%, and grade level 14 to above were 18.4%.

Table 3.1.0 Result of binary logistic regression analysis of significant studied variables Better lifestyle of retired civil servants in Kano State Nigeria

Variables	Categories	B	S.E	P Value	Odds Ratio	95% C.I. for OR	
						Lower	Upper
Highest position held during service	Junior employee	-2.084	0.816	0.011*	0.124	0.025	0.616
	Senior employee	0.633	0.897	0.040**	1.883	0.325	10.93
	Managerial employee				1.00		
Nature of retirement	Voluntary				1.00		
	Compulsory	-1.227	0.649	0.009*	0.293	0.082	1.047
	Statutory	-0.404	0.539	0.014*	0.668	0.232	1.920

Note: Level of significance: **p <0.01 and *p <0.05

Table 3.1.0 Shows the results of binary logistic regression analysis of significant studied factors for better lifestyle of retired civil servants in Kano state. For this analysis 14 Independent categorical variables are included to find the significant ones among them. For performing logistic regression analysis, we have merged two categories of better lifestyle i.e. yes for better lifestyle (code 1) and no for not

having better lifestyle (code 0). Different socio-demographic and economic characteristics are included as independent variables in the binary logistic regression model. Finally, the two independent variables Highest position held while in service, and the Nature of retirements were found statistically significant for better lifestyle of the retired civil servants in Kano States. Odds for experiencing a better

lifestyle after retirements for Senior employees is 1.88 times higher better lifestyle compare to the reference Category (ie Managerial employees Category) .And also the Odds of having a better lifestyle for the Junior employee Category is 0.124 lower than the Reference Category (Managerial Category). Odds for experiencing better lifestyle for those who retired after reaching a statutory age of retirement is 0.67 times higher than those in the reference category (ie Those who retired Voluntarily). And the Odds for having Better lifestyle for those who did Compulsory retirement is also 0.293 lower than those who retired Voluntarily. That means reaching high position in service brings a better life style after retirement for the civil servants in Kano State.

Table 3.1.1 Results of ordinal Logistic regression Model fitting information on the lifestyle scores and the other independent variables.

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	272.112			
Final	183.066	89.046	36	.000

Link function: Logit.

From the above table (3.1.1). The model fitting information Table which gives the -2log likelihood for the intercept only and final models can be used in comparison of nested models. The statistically significant chi- square statistic ($p < 0.05$) indicates that the final model gives a significant improvement over the baseline intercept only model. This tell us that the model gives better predictions than if we just guessed based on the marginal probabilities for the outcomes categories. Therefore, the full model (With factors that affect the lifestyle status as a predictor) is significantly better than the lifestyle status model.

Table (3.2.2) Table of the Goodness of fit statistics

	Chi-Square	df	Sig.
Pearson	272.683	244	.100
Deviance	183.066	244	.999

Link function: Logit.

From the above Table (3.2.2) the results of our analysis suggest that the model does fit very well ($p > 0.05$) (ie we do not reject Null hypothesis depending on the observed data). Also the model fits adequately.

4.0 Conclusion And Recommendations

The results also shows that, majority of the respondents were male retired civil servants having the highest percentage of 66.7%. Similarly the results indicate that, the distribution of the education level of the respondents, those with only Primary certificates are 2.8% , this shows that most of the respondents have at least Secondary school certificate and above having fairly the highest percentage of 97.2%. As for the profession distribution of the respondents, those who retired as teachers are 30.5%, Lecturers 14.2%, Medical/ Paramedical workers 9.2%, while the law enforcements agents among them were 6.4%, the majority come from the administrators as they are 39.7%. For the distribution of the highest position held by the respondents during service, those that have retired as junior employees are 37.6%, while those that are senior employees are 50.4%, and the percentage of those who rose up to managerial positions are only 12%. It follows that for the grade level of or level

service, those that have retired at grade level within the range 03-06 are 31.9%, 07-10, 24.1%, 11-13 25.5%, and grade level 14 to above were 18.4%. For the distribution of years spend in service by the respondents those that have retired after serving for less than 10years,are 5.1%,11-20years 23.4%, 21-30years 35.5%,and the highest percent is for those that have retired between 31-35 years having 36.2%, this indicate that majority of the respondents retired after reaching the mandatory years of 35 in service or attaining the 60years of age. And for the nature of retirement distribution of the respondents those who lived better life compared to those who were not attended any seminar. Because those type of seminars were conducted by professionals, with intent to help and guide the prospective retired civil servants on how to prepare for the life after retirement, and also they train them on how to manage themselves, this shows the effect of those seminars.

References

- [1]. Akinboye, K .(2004). Unsweet rest after labour; retired Nigerians are not living a rosy life.. African concord, March 1.
- [2]. Denga, D.I. (2010). Human engineering for high production in Industrial and other work organizations. Calabar:Rapid Educational Publishing Limited.
- [3]. Onoyas, A. (2013). Financial planning strategies towards retirement as perceived by potential retirees in Universities in the Niger Delta, Nigeria, International Journal of Business and Social Science. 4(14): 2-8
- [4]. Oshiomole, A. (2009). The inevitability of the contributory pension system: Opportunities and challenges. Paper Presented at the national conference on the review of the implementation of the pension reform, jointly organized by The Senate Committee on establishment and public service, the House of Representatives Committee on Pensions and the national pension commission, 19-20 May, at the Transcorp Hilton Hotel, Abuja.
- [5]. Osuala, E.C. (1985) Retirement Counselling is Necessary. Nigerian Statement. Page 8-17. Regev, I. (2011) Expectations and impact of retirement preparation programs, The Herczeg Institute on Aging, Tel Aviv University.

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