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*Full Length Research Paper*

# Quantile regression, a little-known analysis option in psychological research

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**Binary logistic regression is a well-known and widely used regression technique in psychology and health sciences. This technique allows the introduction of all types of regressors and is very flexible in terms of assumptions; it requires a random sample of  $n$  participants evaluated on  $k$  predictor variables that show low collinearity and on a dichotomous qualitative variable that is the predicted variable. A practice that is found with relative frequency in this field of research is to dichotomize a quantitative variable (by the cut-off point to define the case) to apply logistic regression and thus take advantage of the usefulness of the logistic regression. However, it is not a recommended procedure, since a lot of information (variance) of the predicted variable is lost, when there is a much better alternative, namely, quantile regression. This is a little-known and rarely used regression technique in psychology. It requires a quantitative variable as a predicted variable, accepts all kinds of predictor variables, and is free from the restrictive assumptions of ordinary least squares linear regression. This methodological article aims to present quantile regression in its theoretical aspects and shows an example applied to the area of health psychology to promote its knowledge and use.**

**Key words:** Quantile regression, logistic regression, multiple linear regression, multivariate statistics, psychology.

## INTRODUCTION

The objective of this methodological article is to present quantile regression in its theoretical aspects to promote its knowledge and use, since it is a very useful but little-known predictive tool. An example applied to the field of social and health psychology on the attitude towards people living with HIV/AIDS is used to make the presentation of the analysis technique more practical and understandable.

In psychology and health sciences, a very frequent practice for data analysis involves the dichotomization of

the quantitative variables that are intended to be predicted. In the clinical setting, for example, we can see this practice when establishing cut-off points to determine the presence or absence of a target condition (Hajian-Tilaki, 2018), thus allowing the use of binary logistic regression, which is a method that allows the introduction of continuous, ordinal or categorical variables in the predictive model, as opposed to multiple linear regression, which is an analysis technique that exclusively allows the use of quantitative variables (Stolper and Walter, 2019).

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A regression technique that requires a quantitative variable as the predicted variable and that accepts any type of predictor variable is quantile regression, which is a better option than dichotomizing and estimating a binary logistic regression model (Waldmann, 2018). Indeed, when the predicted variable is quantitative, quantile regression is a better option than transforming the predicted variable into an ordinal variable (after defining  $k$  class intervals) to apply ordinal logistic regression since it makes use of all the information content of the quantitative variable (variance) and allows defining models for different quantile orders, for instance 0.25, 0.50, and 0.75 (Koenker et al., 2017; Konstantopoulos et al., 2019). Furthermore, quantile regression was developed as an alternative to ordinary least squares linear regression when the assumptions of homoscedasticity and normality of errors distribution are not fulfilled (Furno and Vistocco, 2018); consequently, about the fulfillment of assumptions, quantile regression is a very flexible non-parametric technique. Moreover, quantile regression can also be adapted to situations in which there exist correlated errors (Alhamzawi and Ali, 2018, 2020; IBM, 2021).

**HISTORICAL NOTE**

This regression technique was developed by Koenker and Bassett (1978) based on the works written by several authors, namely: Bošković (1757), who wrote about minimum absolute errors; Laplace (1789), whose work was related to the situation method; and Edgeworth (1887, 1888), who introduced the concept of the plural median. Initially, ordinal regression was applied in economic and business sciences; nevertheless, it was soon realized that it was an excellent option for analysis in ecology and health sciences (Cade and Noon, 2003; Koenker, 1998; Staffa et al., 2019), which are scientific fields in which it is common to find non-normal, heteroscedastic non-quantitative variables and non-linear interactions. Thanks to the development of computer statistics that, finally, this analysis technique has become popular, since it requires complex calculation procedures based on linear programming. Nowadays, statistical software packages (e.g., R, SPSS, STATA, Matlab, Eviews, and GRETL among others) can perform this regression analysis (Furno and Vistocco, 2018).

**THEORETICAL BASIS AND TECHNICAL ASPECTS**

If ordinary least squares regression predicts the mean values of  $Y \in \mathbb{R}$  conditional on the vector  $x \in \mathbb{R}^p$  (or vector of the scores on the predictor variables), quantile regression predicts the values of the median or other quantiles of  $Y$  conditional on the vector  $x$ . The estimation is performed by minimizing the sum of the absolute

deviations. This minimization is usually solved by the simplex method, introduced by Edgeworth (1888) and developed by Barrodale and Roberts (1974). Although other computational options exist, they require large samples, demand more computational resources, and may have more convergence difficulties than the simplex method (Alhamzawi and Ali, 2018; Lustig et al., 1994; Yang et al., 2016).

Quantile regression posits the estimation of the quantile of order  $\tau$  of the variable  $Y$ ,  $Q_Y(\tau)$ , as a minimization problem (Koenker, 2005).

$$Q_Y(\tau) = F^{-1}(Q_Y(\tau)) = q \in \mathbb{R}; F(Q_Y(\tau)) = \tau \in (0, 1)$$

$$Q_Y(\tau) = \arg \min_{q \in \mathbb{R}} \sum_{i=1}^n \rho_{\tau}(y_i - q) = \arg \min_{q \in \mathbb{R}} \left( \sum_{y_i \geq q} (\tau - 1)(y_i - q) + \sum_{y_i < q} \tau(y_i - q) \right)$$

$$= \arg \min_{q \in \mathbb{R}} \left( \tau \sum_{y_i < q} (y_i - q) - (1 - \tau) \sum_{y_i \geq q} (y_i - q) \right)$$

where  $Q_Y(P) = q =$  quantile function or inverse of the cumulative distribution function,  $F_Y(y) = P(Y \leq y) = \tau =$  cumulative distribution function,  $\tau =$  cumulative probability or quantile order,  $q =$  value of the quantile of order  $\tau$  of the variable  $Y$ , and  $\rho_{\tau} =$  loss function of the quantile of order  $\tau$  of the variable  $Y$ .

$$u = y_i - q$$

$$\rho_{\tau}(u) = u \times (\tau - 1_{u < 0})$$

$$\text{Indicator function: } 1_{u < 0} = \begin{cases} y_i - q \geq 0 & 0 \\ y_i - q < 0 & 1 \end{cases}$$

Next, the conditional quantile to a linear model based on  $k$  predictor variables is defined, and it is proposed to estimate the vector of regression weights through the minimization of the loss function of the conditional quantile (Koenker, 2005).

$$Q_{Y|X}(\tau) = X\hat{\beta}$$

$$\hat{\beta} = \arg \min_{\beta \in \mathbb{R}^k} \left[ \sum_{i=1}^n \rho_{\tau}(Y_i - \beta X_i) \right]$$

where  $X =$  design matrix with a unit vector in the first column and the scores of the  $n$  participants in the  $k$  variables, which can be either quantitative (cofactors), ordinal or qualitative (factors).  $\hat{\beta} =$  vector of estimated parameters with the intercept of the model, the regression weights of the cofactors, and the position parameters of the categories of the factors.  $\rho_{\tau} =$  loss function of the quantile of order  $\tau$  of the conditional variable  $Y$  to  $X\hat{\beta}$ .

Usually, the order of the quantile is one half, that is, the median. When this quantile is chosen, which is the default option in statistical software packages (IBM, 2021;

Koenker, 2016), the optimization problem consists in minimizing the sum of the absolute deviations (Koenker, 2005)

$$\hat{\beta} = \arg \min_{\beta \in \mathcal{R}^k} \left[ \sum_{i=1}^n |Y_i - \hat{\beta}X_i| \right]$$

The Statistical Package for Social Sciences (SPSS) can handle multiple cofactors (quantitative variables) and factors (nominal and ordinal variables), taking the last nominal or ordinal category of the factor as the reference category (IBM, 2021; Koenker, 2016); likewise, it allows the application of two methods to estimate the parameters: the simplex method (Barrodale and Roberts, 1974; Koenker and d'Orey, 1987) and the Frisch-Newton interior-point method for nonlinear optimization (Frisch, 1956; Lustig et al., 1994). This statistical software chooses the most convenient method as a function of the computational requirements of the task; the simplex method is more suitable for small samples, whereas the Frisch-Newton method is more efficient for large sample sizes (Koenker et al., 2017). By default, the error terms are assumed to be independently and identically distributed, but this option can be changed to covariant and heteroscedastic errors. The scatter plot, where the x-axis represents the observed scores and the y-axis represents the predicted scores, can be examined to find out which assumption fits more to the data set. A funnel-shaped (or an almond-shaped) point cloud indicates the presence of heteroscedastic residuals. In turn, the independence of the errors can be verified through the Wald and Wolfowitz run test (1943) and a graph of the sequence of the residuals, plotted in the order of collection. If the sequence reveals regular patterns, and a residual can be predicted by the previous one or another previous one, it is inferred that there is a serial dependence between the prediction errors.

SPSS presents the point estimates, asymptotic standard errors, significance tests with Student's *t* distribution with  $n-p$  degrees of freedom, and 95% confidence intervals for the  $p$  parameters (model intercept, regression coefficients corresponding to the cofactors, and position parameters of the categories of the factors), the calculation of the Pseudo R-Squared coefficient suggested by Koenker and Machado (1999), the mean absolute error, the point estimates and 95% confidence intervals for the *Y*-scores and the residuals. It also computes the variance-covariance matrices and the correlations of the estimated parameters, either through the nonparametric method developed by Bofinger (1975), which is the default method, or through the parametric method proposed by Hall and Sheather (1988).

As with other regression methods, it is possible to specify nested effects and interactions between variables (IBM, 2021). Nested effects can be included in the quantile regression model when the values of one

variable are only known for specific values of another variable and these two variables do not covary within their full potential range of values. The interaction between variables can be introduced in the model when there is significant and non-linear covariance between two predictor variables (Koenker et al., 2017).

## EXAMPLE OF THE APPLICATION IN SOCIAL PSYCHOLOGY AND HEALTH SCIENCES

The following is an example of an application of quantile regression. It focuses exclusively on its statistical and analytical characteristics and ignores the theoretical aspects of the field of psychology; therefore, no theoretical framework, hypothesis formulation, or discussion of the data is provided. A relatively small sample size, but appropriate for the technique, was chosen to make the presentation of the analyses more manageable.

Considering the example a random sample of 40 young adult men (18 to 40 years old) drawn from a population of patients receiving medical care in a medical center located in a city in Mexico. The mean schooling of the participants is 10 years. Religiosity ( $X_2$ ) is assessed through a closed-ended question. The attitudes toward gay people as well as the attitudes toward people living with HIV/AIDS (*Y*) are assessed through two self-report scales, namely: the 10-item Scale of Attitude toward Homosexuality (EAH-10) (Moral and Ortega, 2010; Moral and Martínez-Sulvarán, 2012) and the Scale of Attitude toward People Living with HIV/AIDS (Moral and Valle, 2020, 2021). The question regarding religiosity asks about the frequency of attendance at religious services and had five answer options: 1 = never or only in special services related to personal and cultural commitments, 2 = at least once a year motivated by religious faith or religious duty, 3 = at least once a month motivated by religious faith or religious duty, 4 = once or almost once a week, and 5 = at least once a week (Moral, 2010). Scores on the two attitude scales are percentile scores from 1 to 100; in both scales, a higher percentile score evidences a greater level of rejection toward the attitudinal object (that is, a more negative attitude).

Now, taking into account the data shown in Table 2, the objective is to estimate a model to predict an attitude of rejection toward people living with HIV/AIDS (quantitative variable measured on an interval scale) as a function of religiosity (variable of ordered categories) and the level of rejection toward gay people (quantitative variable measured on an interval scale) using quantile regression of order  $\tau = 0.5$  (predicted median values).

Table 1 shows the point and interval estimates of the parameters of the predictive model as well as their asymptotic standard errors and the tests of statistical significance (Student's *t*-test with degrees of freedom =  $n - p = 40 - 6 = 32$ ). Six parameters were estimated ( $p = 6$ ): the intercept of the model  $b_0$ , the regression weight of



**Table 1.** Estimation and significance of the parameters of the quantile regression model of order  $\tau = 0.5$  (predicted median values).

Parameter	$b_i$	$s_{b_i}$	$t$	$df$	Sig.	LL	UL	$r$
$b_0$	42.4314	13.1617	3.2238	34	.0028	15.6836	69.1792	0.4839
$b_1$	0.5098	0.1242	4.1033	34	.0002	0.2573	0.7623	0.5755
$b_{2 X_2=1}$	-36.3529	11.8796	-3.0601	34	.0043	-60.4951	-12.2108	0.4647
$b_{2 X_2=2}$	-22.1569	11.9111	-1.8602	34	.0715	-46.3631	2.0493	0.3039
$b_{2 X_2=3}$	-7	12.1154	-0.5778	34	.5672	-31.6214	17.6214	0.0986
$b_{2 X_2=4}$	-3.2549	12.6056	-0.2582	34	.7978	-28.8726	22.3628	0.0442
$b_{2 X_2=5}$	0							

Dependent variable =  $Y$  = attitude toward people living with HIV/AIDS. Predictor variables:  $X_1$  = attitude toward gay people and  $X_2$  = religiosity = {1 = very low, 2 = low, 3 = medium, 4 = high, 5 = very high}. The ordered category 5 (very high religiosity) was taken as the reference category and, as a consequence, a location or intercept parameter was not estimated. Estimated parameters ( $b$ ):  $b_0$  = intercept of the model,  $b_1$  = weight of the quantitative variable (attitude toward gay people), and  $b_{2|X_2}$  = conditional location parameters (constants) to the value of religiosity (from 1 to 4; category 5 was used as the reference category).  $s_{b_i}$  = standard deviation or error of the parameter estimates,  $t = b/s_{b_i}$  = value of the contrast statistic for the significance of the estimated parameter,  $df = n - p$  = degrees of freedom for the test of significance or difference between the size sample  $n$  and the number of estimated parameters  $p$ , Sig. = two-tailed probability in a Student's  $t$ -distribution with  $n - p$  degrees of freedom, LL = lower limit of the interval estimate of the parameters of the quantile regression model of order 0.5 (median value) and with a confidence level at 95%, UL = upper limit of the aforementioned interval,  $r = |t|/\sqrt{(t^2+df)}$  = effect size estimated by Cohen's  $d$ . The estimation of the parameters and their errors was carried out using the simplex method. The error terms were assumed to be independently and identically distributed.

Source: Authors

the cofactor  $b_1$  (attitude toward gay people), and the four position parameters for religiosity  $b_{2|X_2=1}$ ,  $b_{2|X_2=2}$ ,  $b_{2|X_2=3}$  y  $b_{2|X_2=4}$  (categories ordered from 1 to 4; category 5 was used as the reference category). The statistical package chose the Barrodale-Roberts simplex method (1974) to estimate these six parameters, being this method the most suitable for the analysis of this small sample ( $n = 40$ ). It was assumed that the error terms were

independently distributed and had homogeneity of variance. In this model, the significant parameters were the intercept, the weight of the attitude toward gay people, and the location parameter of people with very low religiosity (first ordered category); the other three location parameters were not significant (from the second to the fourth ordered category of religiosity).

$$T = b_1/s_{b_1} = 0.5098/0.1242 = 4.1033 \sim t_{gl = n-p}$$

$$gl = n - p = 40 - 6 = 34$$

$$Sig. = 2 \times (1 - P(t_{34} \leq t = 4.1033)) = .0002 < \alpha = .05$$

$$P\left(b_1 - {}_{1-\frac{\alpha}{2}}t_{n-p} \times s_{b_1} \leq \beta_1 \leq b_1 + {}_{1-\frac{\alpha}{2}}t_{n-p} \times s_{b_1}\right) = 1 - \alpha$$

$$P(0.5098 - {}_{0.975}t_{34} \times 0.1242 \leq \beta_1 \leq 0.5098 + {}_{0.975}t_{34} \times 0.1242) = .95$$

$$P(0.5098 - 2.0322 \times 0.1242 \leq \beta_1 \leq 0.5098 + 2.0322 \times 0.1242) = .95$$

$$P(0.2573 \leq \beta_1 \leq 0.7623) = .95$$

According to Ringquist (2013), for a given regression coefficient whose significance is tested using a Student's  $t$ -test with degrees of freedom  $df$ ,  $t = b/s_{b_i} \sim t_{df}$ , the correlation-based effect size can be estimated through the following statistic:  $r = |t|/\sqrt{(t^2+df)}$ . The effect size with this type of statistic can be interpreted using the cut-off points suggested by Cohen (1988) for the correlation coefficient: 0.1 small, 0.3 medium, 0.5 large, and 0.7 very large. Returning to the data shown in Table 1, the attitude of rejection toward gay people acts as a risk factor for

rejection toward people living with HIV/AIDS,  $b_1 = 0.51$ , 95% CI [0.26, 0.76], with a large effect size,  $0.50 < r = |t|/\sqrt{(t^2+df)} = 0.58 < 0.70$ . A very low level of religiosity, compared to a very high level of religiosity, acts as a protective factor,  $b_{2|X_2=1} = -36.35$ , 95% CI [-60.50, -12.21] and shows a medium effect size,  $0.30 < r = |t|/\sqrt{(t^2+df)} = 0.47 < 0.50$ .

Table 2 shows the sample data of the 40 participants, as well as the predictions, the error of each prediction, the interval estimate of the predictions (confidence level

**Table 2.** Observed scores, predictions, and prediction residuals.

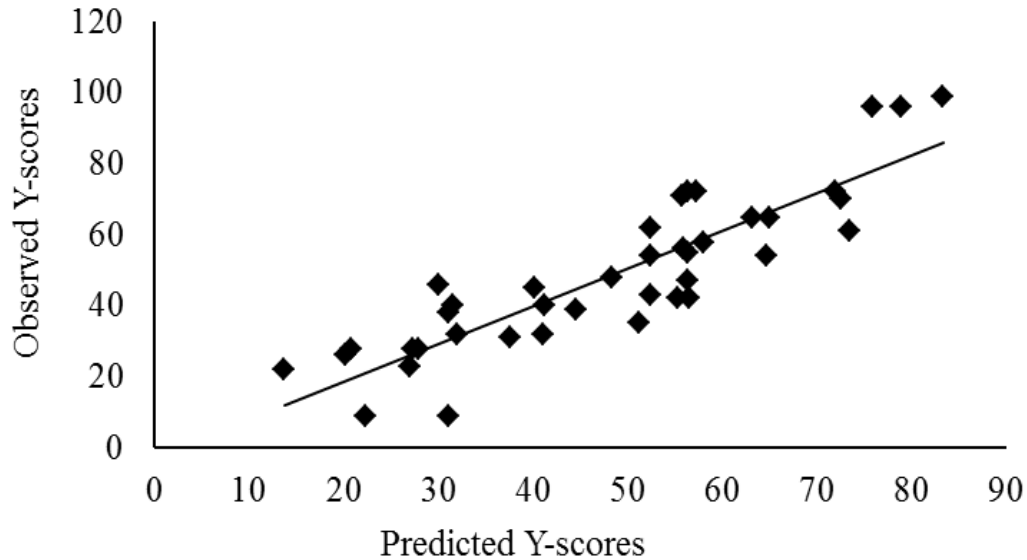
<i>i</i>	$x_{i1}$	$x_{i2}$	$y_i$	$\hat{y}_i$	$s_{\hat{y}_i}$	$LL_i$	$UL_i$	$e_i$
1	18	3	39	44.608	6.160	32.09	57.126	-5.608
2	62	1	31	37.686	4.692	28.15	47.223	-6.686
3	50	1	40	31.569	4.315	22.8	40.337	8.431
4	33	4	56	56	6.490	42.81	69.19	0
5	63	2	62	52.392	4.784	42.67	62.114	9.608
6	58	3	65	65	5.078	54.68	75.32	0
7	41	2	32	41.176	4.579	31.87	50.483	-9.176
8	0	2	26	20.275	7.373	5.29	35.259	5.725
9	15	1	22	13.725	5.681	2.18	25.271	8.275
10	63	2	54	52.392	4.784	42.67	62.114	1.608
11	40	3	71	55.824	5.055	45.55	66.097	15.176
12	71	2	47	56.471	5.201	45.9	67.041	-9.471
13	73	3	70	72.647	5.751	60.96	84.334	-2.647
14	55	2	48	48.314	4.539	39.09	57.537	-0.314
15	74	2	58	58	5.393	47.04	68.96	0
16	71	2	55	56.471	5.201	45.9	67.041	-1.471
17	49	1	9	31.059	4.300	22.32	39.798	-22.059
18	50	4	54	64.667	6.070	52.33	77.003	-10.667
19	67	1	45	40.235	4.968	30.14	50.331	4.765
20	23	2	32	32	5.447	20.93	43.07	0
21	41	3	72	56.333	5.031	46.11	66.557	15.667
22	58	5	72	72	10.506	50.65	93.35	0
23	78	4	96	78.941	6.801	65.12	92.762	17.059
24	29	1	28	20.863	4.750	11.21	30.515	7.137
25	31	3	35	51.235	5.381	40.3	62.171	-16.235
26	72	4	96	75.882	6.506	62.66	89.105	20.118
27	63	2	43	52.392	4.784	42.67	62.114	-9.392
28	49	1	38	31.059	4.300	22.32	39.798	6.941
29	47	4	65	63.137	6.095	50.75	75.525	1.863
30	14	2	28	27.412	6.127	14.96	39.864	0.588
31	41	1	23	26.980	4.330	18.18	35.781	-3.980
32	61	5	61	73.529	10.505	52.18	94.879	-12.529
33	69	1	40	41.255	5.090	30.91	51.600	-1.255
34	39	3	42	55.314	5.080	44.99	65.637	-13.314
35	34	4	42	56.510	6.451	43.4	69.620	-14.510
36	47	1	46	30.039	4.290	21.32	38.758	15.961
37	43	1	28	28	4.306	19.25	36.75	0
38	94	3	99	83.353	7.358	68.4	98.306	15.647
39	43	3	72	57.353	4.996	47.2	67.506	14.647
40	32	1	9	22.392	4.607	13.03	31.754	-13.392

*i* = order in data collection (from 1 to *n*),  $x_{i1}$  = percentile score of participant *i* on the attitude of rejection toward homosexuality,  $x_{i2}$  = ordered category of religiosity for participant *i*,  $y_i$  = percentile score of participant *i* on the attitude of rejection toward people living with HIV/AIDS,  $\hat{y}_i$  = median score predicted for participant *i* by the quantile regression model (order  $\tau = 0.5$ ),  $s_{\hat{y}_i}$  = standard deviation or error of the parameter estimates,  $LL$  = lower limit of the interval estimate of the median score for participant *i* and with a confidence level at 95%,  $UL$  = upper limit of the aforementioned interval,  $e_i$  = residual or sample error of prediction for participant *i*.  
 Source: Authors

at 95%), and the residuals or sample prediction errors.

For instance, the first participant obtained an 18th

percentile score on the scale that assessed rejection toward gay people ( $x_1 = 18$ ), was classified as having a



**Figure 1.** Scatter plot showing the relationship between predicted and observed values.  
Source: Authors

medium level of religiosity ( $x_2 = 3$ ), reached a 39th percentile score in the level of rejection toward people living with HIV/ AIDS ( $y = 39$ ): the predicted score yielded

$$\hat{y}_{i=1} = b_0 + b_1x_{i1} + b_{2|x_2=3} = 42.4314 + 0.5098 \times 18 - 7 = 44.6078$$

$$P\left(\hat{y}_i - {}_{1-\frac{\alpha}{2}}t_{n-p} \times s_{\hat{y}_i} \leq v_i \leq \hat{y}_i + {}_{1-\frac{\alpha}{2}}t_{n-p} \times s_{\hat{y}_i}\right) = 1 - \alpha$$

$$P(44.6078 - 2.0322 \times 6.1596 \leq v_i \leq 44.6078 + 2.0322 \times 6.1596) = 1 - \alpha$$

$$P(32.0900 \leq v_i \leq 57.1257) = 0.95$$

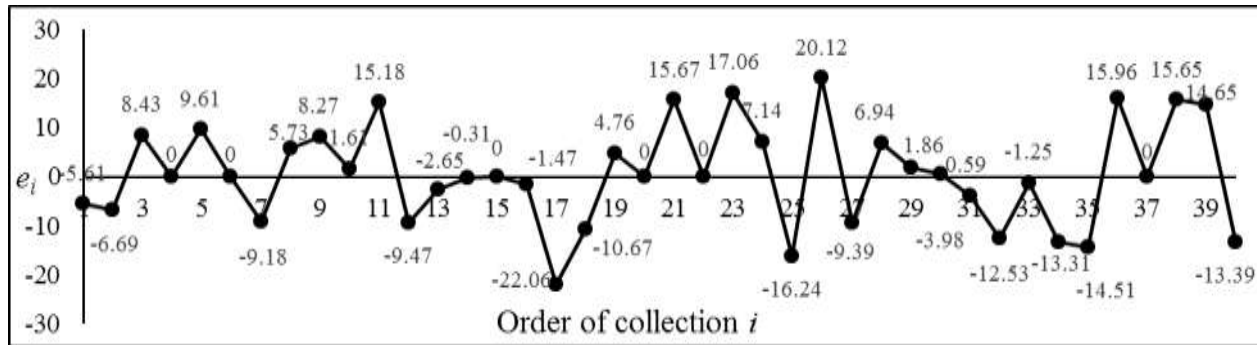
$$e_i = y_i - \hat{y}_i = 39 - 44.6078 = -5.6078$$

(Y-axis) Y-scores shows homogeneity in the opening of the point cloud around an ascending straight line (Figure 1). On the other hand, the Wald and Wolfowitz (1943) run test allows us to maintain the null hypothesis of independence of errors. To perform this test, the residuals are arranged in the order of collection of the score vectors ( $j$  from 1 to 40); thereafter, the median of residuals is calculated,  $Mdn(E) = 0$ , and it is subsequently used as a criterion to dichotomize them: if  $e_i < Mdn(E)$ ,  $d_i = 0$ ; and if  $e_i \geq Mdn(E)$ ,  $d_i = 1$ . Afterward, the number of residuals lower than the criterion or zeros in D ( $n_0 = 17$ ) and the number of residues higher than or equal to the criterion or ones in D ( $n_1 = 23$ ) are counted. Additionally, the runs of zeros and ones in D are calculated ( $R = 15$ ). Since both  $n_0$  and  $n_1$  are higher than 20, the exact probability is computed. The punctual probability is 0.025, the left-tailed exact probability ( $R = 15 < Mdn(R) = 20.5$ ) equals to 0.048, and the two-tailed exact probability equals to 0.073, which is a value higher than the conventional level of significance ( $\alpha = 0.05$ ). The null

by the quantile regression model was equal to 44.61 (95% CI [32.09, 57.61]) and the residual was  $-5.61$ . The scatter plot between observed (X-axis) and predicted

hypothesis would also hold with a two-tailed asymptotic probability and a significance level of 0.05:  $E(R) = 20.55$ ,  $SD(R) = 3.05$ ,  $Z = (R-0.5-E(R))/SD(R) = -1.66$ ,  $Sig. = 2 \times P(Z \leq -1.66) = 0.098 > \alpha = 0.05$ . Likewise, the graph of the sequence of the residuals (in the order of collection of the score vectors for the predictor variables) shows a random order (Figure 2). Consequently, it is appropriate to assume that the residuals are independent and have homogeneity of variance. If these assumptions do not hold, you can change the calculation option in SPSS (IBM, 2021).

The correlation matrix between the estimated parameters, considering them as random variables, was calculated using the nonparametric method proposed by Bofingeb (1975). This matrix allows us to see that the regression coefficient of the attitude toward gay people (scale parameter) has a trivial correlation with the position parameters of religiosity (from 0.07 to 0.14) and a medium correlation with the intercept of the model (-0.56). The correlations of the position parameters of



**Figure 2.** Diagram of the sequence of residuals  $e_i$  in the order of collection of the score vectors for the predictor variables  $i$  (from 1 to 40).

Source: Authors

**Table 3.** Correlations of parameter estimates (quantile of order 0.5).

Parameter	$b_0$	$b_1$	$b_{2 x_2=1}$	$b_{2 x_2=2}$	$b_{2 x_2=3}$	$b_{2 x_2=4}$	$b_{2 x_2=4}$
$b_0$	1	-.562	-.837	-.818	-.807	-.754	0
$b_1$	-.562	1	.140	.110	.112	.071	0
$b_{2 x_2=1}$	-.837	.140	1	.854	.840	.802	0
$b_{2 x_2=2}$	-.818	.110	.854	1	.834	.798	0
$b_{2 x_2=3}$	-.807	.112	.840	.834	1	.784	0
$b_{2 x_2=4}$	-.754	.071	.802	.798	.784	1	0
$b_{2 x_2=4}$	0	0	0	0	0	0	0

Dependent variable:  $Y$  = percentile scores on attitude toward people living with HIV/AIDS. Quantile regression model of order 0.5 estimated by Barrodale-Roberts simplex method (1974), assuming that errors are independently distributed and have homogeneity of variance:  $b_0$  (intercept) +  $b_1 \times x_{i1}$  (product of the regression weight and the percentile score on the scale of attitude toward gay people) +  $b_{2|x_2}$  (position parameter for religiosity) =  $42.43 + 0.51x_{i1} - 36.35$  (if  $x_2 = 1$ ) or  $-22.16$  (if  $x_2 = 2$ ) or  $-7$  (if  $x_2 = 3$ ) or  $-3.25$  (if  $x_2 = 4$ ) or  $0$  (if  $x_2 = 5$ ). The ordered category 5 (very high religiosity) was the reference category for the ordinal variable of religiosity. Correlations were estimated by the non-parametric method proposed by Bofingeb (1975).

Source: Authors

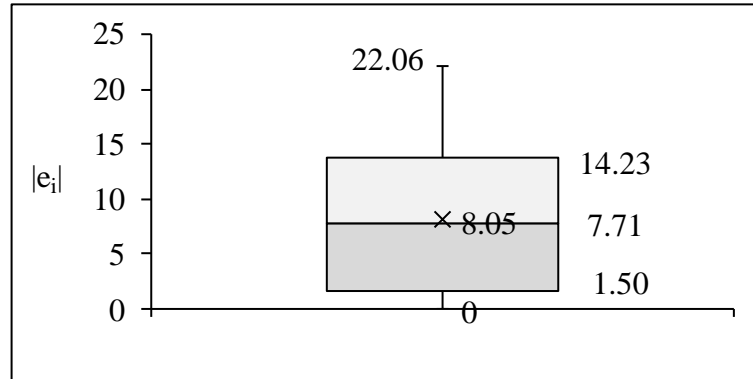
religiosity are very high with each other (from 0.78 to 0.85) and with the intercept of the model (from -0.84 to -0.75). The correlations between the parameters of the predictor variables (scale and position) are positive or direct, but the correlations of the predictor variables with the model intercept are negative or inverse (Table 3). This indicates low collinearity between both predictors and linearity between the ordered categories of  $X_2$  (religiosity).

The model showed very good goodness of fit when estimated through the Pseudo R-squared coefficient proposed by Koenker and Machado (1999), which is a local measure of fit that measures the goodness of fit by comparing the sum of the weighted deviations of the final model with the sum of the intercept only model. It only takes into account the fit of the predictions to the observed data, but does not consider the number of variables in the final model or pay attention to parsimony.

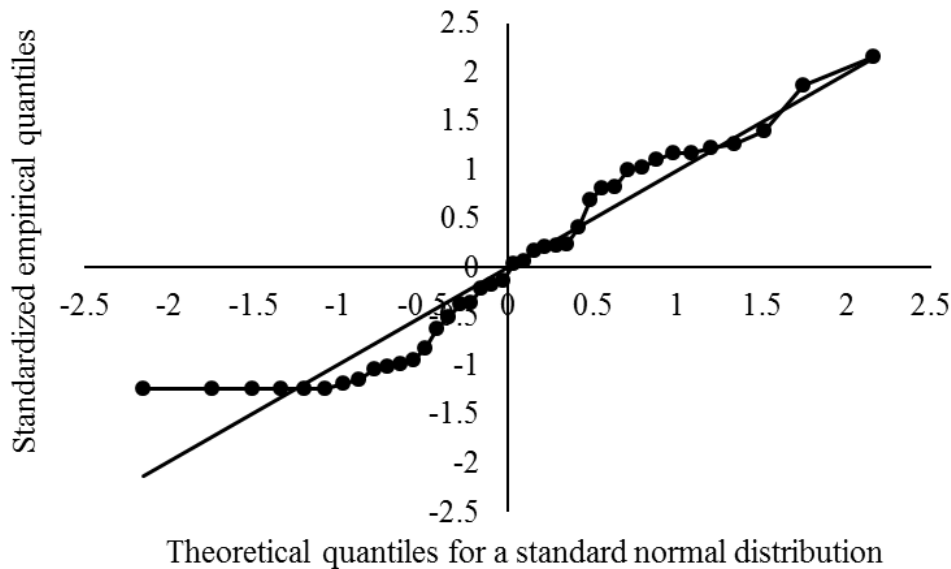
$$R_{Q_Y(0.5)|X_1X_2}^2 = 1 - \frac{\hat{V}_1(\tau)}{\hat{V}_0(\tau)} = 1 - \frac{\sum_{i=1}^n \rho_{\tau=0.5}(y_i - b_0 - b_2x_{i2} - b_{1|x_{i1}})}{\sum_{i=1}^n \rho_{\tau=0.5}(y_i - b_0)}$$

$$= 1 - \frac{\sum_{i=1}^n |y_i - b_0 - b_2x_{i2} - b_{1|x_{i1}}|}{\sum_{i=1}^n |Y_i - b_0|} = 1 - \frac{321.9216}{687} = 0.5314$$

The mean absolute error (MAE), in this sample composed of 40 participants, was 8.05.



**Figure 3.** Box-and-whisker plot of the absolute residuals.  
Source: Authors



**Figure 4.** Normal quantile-quantile plot of the absolute residuals.  
Source: Authors

$$MAE = \frac{\sum_{i=1}^n |E_i|}{n} = \frac{\sum_{i=1}^n |y_i - \hat{y}_i|}{n} = \frac{321.922}{40} = 8.048$$

Although the deviations from the mean converge toward a Laplace distribution, the average of the absolute deviations does not show such distributional convergence. The one-sample Anderson-Darling test can be used to reject the null hypothesis that posits that the absolute errors follow a Laplace distribution. So, at a significance level of 0.05, the null hypothesis of goodness-of-fit is rejected ( $AD = 1.139, p = 0.025 < \alpha = 0.05$ ).

The distribution of absolute residuals is also far from a normal distribution by the Anderson-Darling test (D’Agostino, 1986):  $A = 0.891, AD = A \times (1 + (0.75/n) + (2.25/n^2)) = 0.891 \times (1 + (0.75/40) + (2.25/40^2)) = 0.909 >$

$_{0.05}AD_{40} = 0.736, p = 0.021 < \alpha = 0.05$ ) and by Shapiro-Wilk W test (Royston, 1992):  $W = 0.926, p = 0.012$ ). As shown in Figures 3 and 4, the distribution is truncated at its left tail and has a platykurtic profile (Anscombe and Glynn, 1983) test:  $b_2 = 1.933 < 3, Z = -2.235$ , two-tailed  $p = 0.025 < \alpha = 0.05$ ). In the box-and-whisker plot (Figure 3), the lower whisker is cut off at zero and the boxes are wide relative to the whiskers. On the normal quantile-quantile plot centered at 0 (standardized observed and theoretical quantiles), the dotted line flattens out at the lower end in the third quadrant, reflecting a truncated sample (Figure 4). Furthermore, the curve is convex below 0 and tends to be concave above 0 (up to 1.5), which is characteristic of a leptokurtic profile (D’Agostino et al., 1990).

Since the distribution is unknown, the confidence

interval for the mean absolute error can be estimated by the bias-corrected and accelerated bootstrap interval method (Efron, 1987):  $PSE = 8.048$ ,  $bias = -0.0157$ ,  $SE = 1.037$ ,  $BCa$  95%  $CI$  [5.993, 10.099]; number of bootstrap samples: 1000). The 95% confidence interval shows that it is a value significantly different from 0.

## Conclusion

Binary logistic regression is a technique developed for dichotomized qualitative variables and not for dichotomized quantitative variables (Agresti, 2019). Instead, there is quantile regression, which is a good regression technique for predicting a quantitative variable without distributional requirements of normality or homogeneity of variance in the residuals (Koenker et al., 2017). This technique accepts qualitative, ordinal, and quantitative predictor variables and can even be adapted to correlated residuals (Alhamzawi and Ali, 2018, 2020; IBM, 2021). Moreover, it allows to perform analyses for different quantile orders of the predicted variable; usually, the order is 0.5 (median), but the model can also be estimated for extreme order percentiles, such as 0.25 (lower quartile), 0.75 (upper quartile), 0.10 (first decile) or 0.90 (lower decile); this fact is especially interesting when dealing with heteroscedastic data.

The quantile model for the median value would be the counterpart or equivalent to the multiple ordinary least squares linear regression model for the mean value, and the quantile models for the extreme percentiles would be the counterparts or equivalents to binary logistic regression models of the continuous variable dichotomized by the corresponding percentile; nevertheless, quantile regression would be more appropriate to the assumptions made and the measurement scales of the variables included in the model (Waldmann, 2018).

Quantile regression is a little-known technique in its theoretical foundations as well as in its aspects of calculation and interpretation in psychological research. However, as can be seen from this article, which uses an example applied to the field of social and health psychology, this technique is clear in its rationale and yields results that are easy to interpret. Therefore, its use is recommended when the data warrant it, which are common situations in research in psychology and related sciences. That is why this regression technique is becoming increasingly used in medical research (Konstantopoulos et al., 2019; Staffa et al., 2019) and is available in statistical packages, such as SPSS (IBM, 2021) and R (Koenker, 2016).

## CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

## REFERENCES

- Agresti A (2019). An introduction to categorical data analysis (3<sup>rd</sup> Ed.). Hoboken, NJ: John Wiley & Sons.
- Alhamzawi R, Ali HTM (2018). Bayesian quantile regression for ordinal longitudinal data. *Journal of Applied Statistics* 45(5):815-828.
- Alhamzawi R, Ali HTM (2020). Brq: An R package for Bayesian quantile regression. *METRON* 78(3):313-328.
- Anscombe FJ, Glynn WJ (1983). Distribution of the kurtosis statistics  $b_2$  for normal samples. *Biometrika* 70(1):227-234.
- Barrodale I, Roberts FD (1974). Solution of an overdetermined system of equations in the  $l_1$  norm. *Communications of the ACM* 17(6):319-320.
- Bofingeb E (1975). Estimation of a density function using order statistics. *Australian Journal of Statistics* 17(1):1-7.
- Bošković RG (1757). *Elementorium universae matheseos*. Reprinted in London, UK: Forgotten Books, 2019.
- Cade BS, Noon BR (2003). A gentle introduction to quantile regression for ecologists. *Frontiers in Ecology and the Environment* 1(8):412-420.
- Cohen J (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum and associates.
- D'Agostino RB (1986). Tests for the normal distribution. In: R. B. D'Agostino, & M. A. Stephens (Eds.), *Goodness-of-fit techniques* (pp. 367-419). New York: Marcel Dekker.
- D'Agostino RB, Berlanger A, D'Agostino RB Jr. (1990). A suggestion for using powerful and informative tests of normality. *The American Statistician* 44(4):316-321.
- Edgeworth FY (1887). On observations relating to several quantities. *Hermathena* 6(13):279-285.
- Edgeworth FY (1888). On a new method of reducing observations relating to several quantities. *Philosophical Magazine* 25(154):184-191.
- Efron B (1987). Better bootstrap confidence intervals. *Journal of the American Statistical Association* 82(397):171-185.
- Frisch MR (1956). La résolution des problèmes de programme linéaire par la méthode du potentiel logarithmique. *Cahiers du Seminaire D'Econometrie* 7-23.
- Furno M, Vistocco D (2018). *Quantile regression: estimation and simulation*. Hoboken, NJ: John Wiley & Sons.
- Hajian-Tilaki K. (2018). The choice of methods in determining the optimal cut-off value for quantitative diagnostic test evaluation. *Statistical Methods in Medical Research* 27(8):2374-2383.
- Hall P, Sheather SJ (1988). On the distribution of a studentized quantile. *Journal of the Royal Statistical Society, Series B (Methodological)* 50(3):381-391.
- Koenker R (1998). Galton, Edgeworth, Frisch, and prospects for quantile regression in econometrics. Champaign, IL: Department of Economics, University of Illinois. <http://www.econ.uiuc.edu/~roger/research/galton/Galton.pdf>
- Koenker R (2005). *Quantile regression*. Cambridge: Cambridge University Press. <https://doi.org/10.1017/CBO9780511754098>
- Koenker R (2016). quantreg: Quantile regression. R package version 5.21. <https://CRAN.R-project.org/package=quantreg>
- Koenker R (2017). Quantile regression: 40 years on. *Annual Review of Economics* 9(1):155-176.
- Koenker R, Bassett G (1978). Regression quantiles. *Econometrica: journal of the Econometric Society* 33-50.
- Koenker R, Chernozhukov V, He H, Peng L (2017). *Handbook of quantile regression*. Boca Raton, FL: Chapman & Hall/CRC. <https://doi.org/10.1201/9781315120256>
- Koenker R, d'Orey V (1987). Algorithm AS 229: Computing regression quantiles. *Journal of the Royal Statistical Society, Series C (Applied Statistics)* 36(3):383-393.
- Koenker R, Machado JAF (1999). Goodness of fit and related inference processes for quantile regression. *Journal of the American Statistical Association* 94(448):1296-1310.
- Konstantopoulos S, Li W, Miller S, van der Ploeg A (2019). Using quantile regression to estimate intervention effects beyond the mean. *Educational and Psychological Measurement* 79(5):883-910.
- International Business Machines Corporation (IBM) (2021). *Quantile regression*. In *SPSS statistics*. <https://www.ibm.com/docs/en/spss->

- statistics/SaaS?topic=regression-quantile
- Laplace PS (1789). On some points of the system of the world. *Memoirs of the Royal Academy of Sciences of Paris*.
- Lustig IJ, Marsten RE, Shanno DF (1994). Interior point methods for linear programming: Computational state of the art. *ORSA Journal on Computing* 6(1):1-4.
- Moral J (2010). Religión, significados y actitudes hacia la sexualidad: un enfoque psicosocial. *Revista Colombiana de Psicología* 19(1):45-59.
- Moral J, Ortega ME (2010). Representación social de la sexualidad y actitudes en estudiantes universitarios mexicanos. *Revista de Psicología Social* 24(1):65-79.
- Moral J, Martínez-Sulvarán JO (2012) Validation of the 10-items Homosexuality Attitude Scale (EAH-10). *International Journal of Social Psychology* 27(2):183-197.
- Moral J, Valle A (2020). Propiedades psicométricas de la Escala de Actitud hacia Personas que Viven con VIH/SIDA en estudiantes de medicina mexicanos. *Perspectivas Sociales* 22(1):45-70.
- Moral J, Valle A (2021). Factorial invariance across sexes of the Scale of Attitude toward People Living with HIV/AIDS. *Journal of Behavior, Health and Social Issues* 13(3):1-14.
- Ringquist EJ (2013). *Meta-analysis for public management and policy*. San Francisco, CA: Jossey-Bass.
- Royston JP (1992). Approximating the Shapiro-Wilk W-test for non-normality. *Statistics and Computing* 2(3):117-119.
- Staffa SJ, Kohane DS, Zurakowski D (2019). Quantile regression and its applications: a primer for anesthesiologists. *Anesthesia and Analgesia* 128(4):820-830.
- Stolper O, Walter A (2019). Birds of a feather: the impact of homophily on the propensity to follow financial advice. *The Review of Financial Studies* 32(2):524-563.
- Wald A, Wolfowitz J (1943). Exact test for randomness in the non-parametric case based on serial correlation. *Annals of Mathematical Statistics* 14(4):378-388.
- Waldmann E (2018). Quantile regression: A short story on how and why. *Statistical Modelling* 18(3-4):203-218.

*Full Length Research Paper*

# **The metaphysical views on causation among Batswana: implications for case conceptualization, diagnoses, and treatment in counseling**

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**This study focused on how counsellors in Botswana handle belief systems, spiritual, and religious orientations of clients. It explored common beliefs clients up-held about what causes distress. It explored ways in which counsellors addressed clients' indigenous cultural beliefs and perceptions about the origins of illness, misfortune, and other forms of distress. In-depth interviews were the main data collection tool while content analysis was used in data analysis. Thirty counsellors from different parts of Botswana participated in the study. The study revealed that clients uphold metaphysical views on causation namely, transcendental forces, malevolent forces, witchcraft and sorcery, and disconnection from one's social and spiritual environment are causes of their misfortune and distress. It showed that most counsellors had limited knowledge and skills on how to handle indigenous cultural beliefs of clients. It highlighted deficiencies in counsellor training to prepare counsellors on how to respond to culturally-grounded behaviours and manifestations.**

**Key words:** Metaphysical views, counsellors, Botswana, cultural beliefs, causation.

## **INTRODUCTION**

Although Botswana society is culturally diverse and pluralistic in its religious practices, traditions, and languages different ethnic groups do share a lot in common in terms of perceptions about the origins of illness, misfortune, and other forms of distress. Like in most African societies, religion and illness causation in Botswana, are closely interwoven, with the belief in the role of the supernatural world, the ancestors, and other perceived transcendental powers in having influence in the lives of the living (Chiboola, 2020). Furthermore,

there are certain beliefs, values, and attitudes which influence how Batswana (that is, people of Botswana) explain the universe and its supernatural mysteries and the perceived cosmic forces that sometimes bring human suffering and pain, unleash untold calamities and other traumatic human conditions. Invariably, some people believe that there are always certain transcendental powers beyond them, which generally have great influence in their lives. The general belief is that these powers would affect individuals if they violated

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certain taboos, or became disconnected with the spirit world and other elements of the universe. Many societies have a “multitude of beliefs and practices to express, explain and give meaning to the cosmos” (Greenwood and Airely, 2006:13). Minas et al. (2007) observed that it is common for traditional societies to have supernatural beliefs and “that understanding of causal beliefs is important for the design of culturally appropriate mental health services and for accurate diagnosis and treatment” (2).

The purpose of this study was to explore the common indigenous clients’ beliefs about causation that counsellors dealt with, and the ways in which counsellors addressed these beliefs and perceptions about the origins of their distress or problems. In addition, the study examined counsellors’ views on how to handle clients’ beliefs and worldviews as well as their implications on the conceptualisation of the client’s problems, on diagnosis and treatment of the client’s problem. This paper is influenced by my doctoral degree that made me reflect on counsellor training in Botswana and non-Western perspectives on causality and reality.

## REVIEW OF LITERATURE

### Indigenous cultural beliefs and accessing health services

In their investigation of the indigenous representations of illness in sub-Saharan Africa, Liddell et al. (2005) concluded that “ignoring indigenous beliefs about illness, which African societies have long been construed as essential for their survival and well-being, it seemed counterproductive to the development of culturally grounded and responsive AIDS prevention programs” (698). Liverpool et al. (2004) reported that some patients even refused surgery or other medical treatment unless their healer had sanctioned it. As noted by other scholars (Liddell et al., 2005; Subrick, 2006) it would be futile to ignore the influence and respect of indigenous healers among their communities. These scholars have noted that this perceived authority of the healers has a significant impact upon the decisions that clients make about other services available to them. Bolten (1998) observed that Christians and non-Christians alike in Botswana, used protective and fertility magic, believed in witchcraft and sought out help from indigenous healers in case of illness. She posited that indigenous rituals were still regarded as the premium method used to ensure health, because the approach taken by the healers not only cured the body but also repaired social ties and one’s relationship with their ancestors. Staugård (1985), on the other hand, noted; “because the advice of the traditional healer is well integrated in the religious and moral concepts and beliefs prevailing in society, the

*Ngaka* [indigenous healer] thus assumes a stabilising role in social control.

While over 86.7% of the population in Botswana may profess and practice Christianity (Statistics Botswana, 2018), a significant number simultaneously adheres to other religious practices, including indigenous ones. The blending of religious practices and beliefs (Dembow and Thebe, 2006) is evidenced by ancestor veneration, divination, prophetic practices, and other rituals and ceremonies uniquely cultural that has a bearing on clients’ perception of reality and experiences. All these characteristics and social influences have significant implications for counselling practice, including case conceptualisation, diagnosis, and treatment in counselling.

Despite the rapid expansion of the provision of Western medicine and the educational programmes aimed to inform the public about AIDS and other conditions, many Batswana still rely on indigenous cultural ways of healing to address their health and psycho-social concerns. Togarasei et al. (2016) observed that many Batswana are still attracted to traditional and faith-based interventions in spite of the availability of Western or allopathic health services. Some studies (Bolten, 1998; Dembow and Thebe, 2006) highlighted that many Batswana, regardless of social class and educational level would choose to consult the religious leader or healer when going through challenges or distressful situation than visiting a mental health professional. This may reflect Batswana’s perceived lack of efficacy of the mental health services in understanding and responding to their situations. Barron (2010) argued that “some therapies and spiritualities fail to elucidate to an adequate view of human nature and the human predicament” (6). Yet, Thomas et al. (2015) concluded that “metaphysical factors occasionally explain the presence of abnormal emotional or behavioural states in certain individuals” and that “traditional healers appear to hold a relatively holistic conceptualisation of health, which makes little distinction between the mental and physical aspects, with both often viewed as interconnected” (138).

The inherent cost and ineffectiveness of Western therapies even turned more people to seeking help from their “ancestors and divinely inspired prophets for relief” (Dembow and Thebe, 2006:45). According to Dembow and Thebe, even the response to the increasing death toll due to AIDS reflected grounding in traditional belief. To date, indigenous healers and spiritual healing churches have remained a significant resource for individuals undergoing psychological distress and illnesses of whatever kind. Bolten’s (1998) discussion on Christianity and healers may shed light on the possible reasons for the fusion of Western approaches and traditional healing among Batswana. She maintained that Batswana saw Christian prayers as performing the same function as rituals of the ancestral spirits; for example, of asking for

rain, and others that were now performed by the church leaders. It is, therefore, not surprising that a client in Botswana may seek help from several sources of help in an attempt to address a problem. Invariably, a client might visit an indigenous healer, a spiritual healing church, or seek help from a family member in addition to going to see a counsellor or other care services in the community.

It is important for counsellors to understand models of explaining phenomenon their clients use. Failure to explain a phenomenon within the context of the client's culture may have ramifications for the efficacy of the intervention and client's response to therapy. As noted by Erasmus (1977), "despite an often-ready acceptance of Western medicine these South African population do not necessarily accept the accompanying 'scientific' explanation, and that indeed for many illnesses" (264).

### **Ancestral spirits and other transcendental forces**

In contrast to Western thinking whose primary goal is to deal with the intrinsic forces and the individual phenomena (Staugård, 1985), Batswana may attribute the cause of illness or distress to both a physical phenomenon and the metaphysical realm. Invariably, when addressing a problem, it is common for people to seek other explanations that would involve exploring the metaphysical sphere. Staugård (1985) pointed out that "the 'real' cause will usually be sought in the context of the horizontal relations of the individual with the community physically surrounding him or in the context of his *vertical* (emphasis in original) relations with the *Badimo* [ancestors]" (67). This has implications on how a counsellor would conceptualise the problem presented by the client. The question is, what happens when a counsellor does not address the fact that the client believes that ancestors have a role in his or her predicament or problem? It is possible that the client may feel that part of the cause of the problem has not been addressed hence go seek help elsewhere.

Displeased ancestral spirits could cause illness (Asare and Danquah, 2017; Eagle, 2005; Kahissay et al., 2017). These spirits could do this in a variety of ways, including being invoked by the living or of their own volition without being invoked (Middleton, 1995). As Middleton (1995) pointed out, an elder has the power to invoke spirits to bring sickness to any of the descendants if themselves or their family members behave in a manner so as to displease their ancestors or do what was deemed improper or dangerous to the well-being of the group. Moreover, the belief was that it was bad omen to threaten a young person with 'angry words' for this is believed could invoke the wrath of spirits and cause illness or misfortune to them (Middleton, 1995). When such an encounter occurred, immediate reparation was

advised so as to avert the invocation of the malevolent forces.

Ancestral spirits could convey God's reward through blessings or worst still, His wrath when they "punish their earthly relatives themselves" (Staugård, 1985:50) or "curse or reverse their fortunes" (Amanze, 2002:69). Amanze (2002) intimated that when wrong-doing happens in the family the ancestors resented it and punished the evil-doers, since they are guardians of public morality and of traditions of the elders" (69). Liverpool et al. (2004) attributed this perception that ancestors were guardians of codes of morality and values to the fact that they were widely respected and well-known members of the community. To disconnect from the community or ancestors may be perceived as a cause of distress. To address the disconnection as a cause of distress may require helping the client to reconnect to such a community.

### **Disconnectedness with social and spiritual environments**

An individual's connection with the environment, that is, the physical, social, and spiritual is key to their healthy well-being. Scholars (Staugård, 1985) reported that African peoples believed that an individual's well-being and good health was associated with a positive relationship with others, being at peace with oneself, ancestors and the Supreme Being.

This implies that any break in the relationship and harmony with these different key players in one's life brought about disharmony and an imbalance in one's life. The most important thing for an individual to be involved is constantly checking and restoring this relationship and connection. Any discord with any one of these relationships could result in the loss of connection with all the environments thus causing disharmony in one's life hence psychological and physiological distress.

Staugård (1985) made fundamental observations about sense of belonging as a factor in one's well-being among Batswana; suggesting that "the psychosocial belonging to the community in the Tswana culture is the necessary pre-condition for health" and "any disturbance of this state of belonging leads to disease, illness or bad luck for the individual" (67). Notably, the belief is that for any intervention to be effective the therapist must deal with the client's issue holistically. Such a holistic intervention focused on the client's personal relations, but included ancestors as key players in the everyday life and religious experience. This is, of course, in contravention to Western logic where the focus is mainly on the individual and the intrinsic motivations. The holistic approach presupposes that to effectively resolve a client's problem one has to restore a balance between the individual and the surroundings (Staugård, 1985).

Since lack of connection and closeness to others caused psychological distress the individual has to re-establish the lost connection with their social environment. In helping the client, one also has to prepare him or her to break-down the barriers and internal or external forces that inhibit this connection with the environments. Participating in communal rituals, sacrifice or offerings were viewed as other ways of reconnecting with others, including the ancestors. As plainly articulated by Amanze (2002), "sacrifices and offerings quite often entail the act of bringing together two or more people who have become alienated from each other and the restoration to a peaceful state of those who have been estranged" (22).

Interestingly, indigenous healers and spiritual healing churches pay close attention to the perceived factors that make it difficult for the individual to overcome the external forces that constantly strive to destroy the individual. Various forms of ritualistic performances and activities are employed to help the individual generate power within them to overcome these forces. The main focus is to help restore and to reconcile the individual with the self and perceived powers that create peace and harmony in them.

Studies on healing (Finker, 2004; Francis, 2004) suggest that ceremonies that incorporated rituals (prayer, psychic powers, interpretation of dreams, singing and dancing) and other cultural interventions helped the individual re-direct their energy to positive powers, which are sources of relief. These studies have offered important insights into the power of the network of the group as support mechanism for the new behaviour. They revealed that the individual's encounter in the group re-establishes connection thus making the individual not feel disconnected and separated.

### **Transgressions and violation of taboos**

Many cultures have different taboos or prohibitions that are observed religiously, or without even determining what their meanings are. There are taboos associated with sex, sexual relations, and many others that are believed to bring about problems and consequences to the individual if their teachings are violated (Wolf, 2001). Violations are believed to invoke the wrath of transcendental powers such as nature spirits that bring about calamities or misfortune to the individual (Chiboola, 2020; White, 2015). Anthropological literature (Eagle, 2005; Kahissay et al., 2017; Middleton, 1995) is replete with constant reference to the belief in transcendental powers and violations of taboos as causes of illness and misfortune. Such beliefs about transgressions and violations of various natures are sometimes presented to a counsellor as causes of friction and disharmony in the family or discord in a relationship.

### **Witchcraft and sorcery as causes**

Witchcraft and sorcery are among the most researched topics in relation to causes of illness and misfortune. Some scholars (Eagle, 2005; Fox, 1967; Liddell et al., 2005; Thomas et al., 2015) have written about witchcraft and sorcery as explanations of cause of illness and misfortune or distress among the different cultures of the world. Aceves (1974) commented that witchcraft serves as a means of explaining phenomena that appear to have no other explanation. For example, failures, illnesses, and accidents that are attributed to the acts of a witch. Thomas et al. (2015) re-counted that the witch is depicted as having ability to bring harm to others, including their emotional, relational problems and cause terminal illnesses. Middleton (1995) underscored that witchcraft has to be understood within a social context and that has a coherent logic of its own. He concluded that "given certain premises as to the mystical powers of certain human beings (even though scientifically these premises may not be correct) ... provide explanations for coincidences and disasters" (x). This belief, in Middleton's view, has enabled individuals to project their hopes, fears and disappointments onto other human beings, and by personalising the forces of 'fate' or 'chance' enabling those afflicted by them to deal with them by direct social action against the assumed evil-doers. The question is, how do counsellors in Botswana handle clients' beliefs about causation? Current perspectives emphasise the need to appreciate alternative worldviews to minimise the negative impact of imposition of the Eurocentric view of causation and response (Furlong and Finnie, 2020; Kurniawan, 2018; Nuttgens and Campbell, 2010; Robertson et al., 2015). Furlong and Finnie (2020) intimated that when people express distress they revert to their traditional values and their comfortable cultural ways of reducing its negative effects.

## **METHOD**

### **Research paradigm and theoretical framework**

This interdisciplinary qualitative study sought to explore the metaphysical views on causation among Batswana and their implications for case conceptualisation, diagnoses, and treatment in counselling. Qualitative inquiry shall employ inductive research approach to building abstractions, generating concepts, developing hypotheses and new theories to facilitate a culturally appropriate interventions and training. This approach to research focuses on gaining insights, discover and understand the phenomenon. Central to this study is a systems perspective that is founded on the notions of holistic thinking, inter-connectedness and inter-dependence (Patton, 2002), and inter-relatedness (Laszlo, 1972). Patton suggested that the parts of a system are "so interconnected and inter-dependent that any cause-effect analysis distorts more than it illuminates" (120). He maintained that a description and

interpretation of a person's social environment is essential for overall understanding. This approach "assumes that the whole person is understood as a complex system that is greater than the sum of its parts" (Patton, 2002:59). Within the context of this study, a person is a complete entity, and, therefore, understood not by just looking at the mind or body, but by attending to all aspects of his or her life. We can, therefore, not exclude the power the metaphysical views have on how people perceive their situations and reality.

Understanding human behaviour, in this context, requires looking at the social, cultural, psychological, spiritual, religious and worldview of clients and counsellors. Literature on culture, medical anthropology, religion, indigenous medicine and healing practices was reviewed to provide knowledge and understanding of the concepts and perspectives on causation, and views about well-being.

### Participants

Thirty (30) counsellors who received Western-based training, and had worked for a minimum of two years participated in the study. Demographic and vocational characteristics of included females represented two-thirds of the participants, a majority were from the cities, most of them were from university and the Ministry of Education because they have the highest number of trained counsellors. The average age 30 to 50 years. A majority (n=23) of the participants had Masters degree with varied areas of specializations. Only one (1) participant had a doctoral degree. While 17 of them completed their training in Botswana, eleven (11) received their training in North America, with only one (1) from Europe. Fifteen (15) were from institutions of higher learning, nine (9) from government departments, and five (5) based in schools. Twenty-one (21) worked with students and nine (9) provided community counselling. Twenty-eight (28) declared Christian religious affiliation. All participants had more than two (2) experience.

### Sampling Procedure

Maximum-variation purposeful sampling (Merriam, 1998; Patton, 2002), a non-probability sampling procedure (Merriam, 1998) was used to select participants. Seidman (1991) asserted that this sampling procedure provides the most effective basic strategy for selecting participants for interviews. He observed that it allows access to a maximum range of sites and people that constitute the population. He stated that there is never exhaustive range of characteristics variations in the population selected for study. Like other purposeful sampling procedures, maximum variation aims at selecting information-rich cases (Merriam, 1998; Patton, 2002). Information-rich cases "are those from which one can learn a great deal about issues of central importance to the purpose of the inquiry" (Patton, 2002:230) and that can yield insights and in-depth understanding.

The number of participants for this study was influenced by the number of characteristics that had been identified, including working with ethnic groups, participants' gender, level and place of training, and clientele. For each characteristic at least two (2) participants were considered, resulting a sample of 30. The inclusion of all these characteristics was to ensure incorporation of the different factors that may influence beliefs and perceptions of reality. After receiving approval from the review board to conduct the study counsellors who indicated their willingness to participate signed a consent form where issues of confidentiality, consenting to audio-taping, security of data, and rights to withdraw from the

study were addressed.

### Data collection methods

The use of in-depth interviews was the main method of data collection. Each interview lasted for about 1 to 2 h. Open-ended questions were used because they provide an opportunity to get direct quotations from people about their experiences, opinions, feelings, and knowledge (Patton, 2002). Responses to such questions permit one to understand the world as seen by participants, and to enable understanding and capturing of "points of view of other people without predetermining those points of view through prior selection of questionnaire categories" (Patton, 2002:21). My interaction with participants during data collection helped to appreciate some of the struggles and experiences counsellors face when handling issues associated with clients' beliefs and worldviews. It also helped me reflect on some of the contradictions created by the two dichotomous worlds, one influenced by Western philosophical thought and the other grounded on the African worldview that also immensely taps on the metaphysical to define reality.

Although I grew up in this setting, I have remained oblivious to the contradictions created by these worlds. I realised that we rarely unpack the mysteries surrounding the impact of these two parallel worlds and perceptions of reality.

### Data analysis

Content analysis was used to analyse data. As a qualitative data analysis approach, content analysis includes category construction according to recurring patterns of themes or factors (Merriam, 1998, Patton, 2002). Constructing categories is a systematic and intuitive process informed by the researcher's orientation, knowledge, purpose of the study, and "the meanings made explicit by the participants themselves" (Merriam, 1998:179). As a research tool, content analysis involves determination of presence of certain words or concepts within texts or sets of texts (Merriam, 1998, Patton, 2002). Patton (2002) maintained that content analysis usually has to do with analysing interview transcripts, diaries, or documents not observational field notes. He suggested that in general, content analysis refers to "qualitative data reduction and sense-making effort that takes a volume of qualitative material and attempts to identify core consistencies and meanings". The researcher quantifies and analyses the presence, meanings, and relationships of such words and concepts, then makes inferences about the messages within the texts, audience, and even the culture and time.

In addition, content analysis is reliable because of its coding consistency, replicability of the category classification, and accuracy while its validity can be easily achieved through the process of triangulation (Creswell, 1994; Merriam, 1998; Patton, 2002) as well as audit trail (Merriam, 1998). Content analysis "themes, patterns, understandings, and insights that emerge" (Patton, 2002:5) were the most appropriate method for this study.

## FINDINGS

### Common beliefs of clients

When participants were asked to discuss their clients' beliefs and worldviews six (6) common beliefs were

identified by clients as responsible for their problems or circumstances. Content analysis revealed that the following were mentioned a number of times during the interviews: witchcraft (24), bad luck (6), ancestors (6), spirit possession (5), not obeying a 'calling' (4), and evil forces (2). Witchcraft was the most common belief by clients. "People strongly believe in witchcraft," one participant observed. "As you discuss with a client you come to appreciate that the client believes that he or she has been bewitched, and has consulted either a diviner, or spiritual healer who confirmed, or an indigenous healer is handling it," disclosed one participant. A majority of participants expressed feelings that it was common for people to feel threatened by some powerful malevolent forces that worked against them most of the time.

Most participants indicated that handling problems associated with spiritual inclinations; or the clients' belief systems seems to be the most complex and challenging. They maintained that counsellor training did not prepare them to tackle these beliefs and perceived spiritual manifestations presented by clients. One participant summed it up this way; "issues of witchcraft are difficult to handle, and I have never made any breakthrough with them, hence clients never come back once they realize that I don't understand, or have no appreciation of their beliefs."

Some participants recounted that some clients come to seek help because they feel that their problems are a result of ancestors turning against them. In the case of students, they would come to seek assistance so that they can go home to participate in some ritual for appeasing their ancestors. Some students would even attribute their problems to failure to participate in a family ritual. Yet, other clients expressed the need to reconcile with a family member particularly an elder to prevent his or her anger invoking the spirits to turn against them. Those clients from the Christian faith, on the other hand, reported that they resorted to prayer whenever they had a problem. Clients sought help from spiritual healing churches instead of counsellors. For those participants who worked in school setting encountered cases of spirit possession, for example, a student falling into a trance in class and then the counsellor is asked to intervene. Such cases have baffled most participants because they felt handicapped in dealing with them.

### **Views on handling clients' beliefs**

Content analysis of the interview transcripts resulted in four main categories depicting ways in which participants dealt with clients' beliefs: respect for the clients' beliefs and worldviews mentioned 27 times, accept that it is difficult to deal with the beliefs 14, change client's worldview (3), utilise the belief system of the client to explore the problem (4), and consider referral to other

professionals (2).

### ***Respect clients' beliefs and worldviews***

Numerous statements given by participants reflected their views about respecting the beliefs and worldviews of their clients as most important. Invariably, participants cautioned against attempts to "re-shape", "dismiss", "discredit", "belittle" the client's worldview, or "ignore" the client's beliefs during counselling. As one participant advised, "you have to acknowledge and embrace your client's beliefs rather than dismiss or belittle them." She suggested that "where you are not sure you should ask so that the client can explain his/her worldview." Some participants reported that some clients never came back once they felt that the counsellor did not understand "where they are coming from."

### ***Avoiding changing client's beliefs or worldviews***

One participant observed that her tendency is to dismiss some of the beliefs without even exploring the problem fully. Yet, another participant wondered how a counsellor would "convince a client that what they believe in does not exist when the client has examples of instances that led to this thinking." Her opinion was that "counsellors and clients may have different worldviews, and the counsellor needs to help the client understand herself better instead of trying to change the client's worldview to fit her own." Another participant suggested that it is not helpful to spend time trying to convince the client to see things differently, or to view the world from your own perspective as a counsellor.

Others have seen belief systems as foundation for counselling. There was constant reference to the fact that beliefs are central in counselling. Some arguments were that to ignore the different belief systems would not help a counsellor get to the root of the problem of the client. As one participant observed, "Batswana are predominantly religious, and most of their lives are influenced by their beliefs and values."

### ***Utilise the belief system of the client***

Some participants maintained that the best way of handling beliefs is by utilising the belief system of the client to explore the problem presented. According to one participant, "if you are from a place where such a belief is not prevalent you should try to understand what it means to a client for instance to be bewitched instead of trying to rationalise with him/her about the nonexistence, or the unscientific nature of witchcraft." One participant proclaimed that there is need to "explore all different

options, including examining Western and indigenous Batswana perspectives on the issue, and ways in which such problems are treated in both systems.”

### ***Refer to other service providers***

There are those participants who indicated that they felt inadequate in handling cases that involved indigenous cultural beliefs and religious-spiritual issues. Others indicated that they would be comfortable handling a client with a Christian worldview and beliefs than those with African traditional religious beliefs. They argued that Christian beliefs and worldview fits their own philosophy of life. Such sentiments were common among those participants in the school system where they sometimes handle behaviours associated with religious or spiritual matters. The most common approach was to refer clients to other service providers because they knew very little about indigenous cultural beliefs. Yet those professionals they referred to were also handicapped in addressing issues associated with indigenous beliefs.

### **Difficulty dealing with indigenous cultural beliefs**

The participants expressed difficulty in dealing with clients' beliefs and worldviews. They attributed the problem to their lack of training on how to handle these cultural beliefs. They felt handicapped due to lack of knowledge and understanding on how to deal with the various complex manifestations presented to them by their clients. This problem was predominant with those who dealt with young people, especially within the school system.

## **DISCUSSION**

Literature (Nadel, 1967; Thomas et al., 2015; Van Dyk, 2001) is replete with discussions of witchcraft as a perceived cause of illness among different societies in the world. Research also emphasise the need to understand beliefs such as those associated with witchcraft within a social context. Discussing the traditional African perceptions of causes of illness, Van Dyk (2001) reported that “traditional Africans believe that disease [mental and physical] can be caused by natural causes such as germs, ‘pollution’, failure of human relations, disharmony between a person and the ancestors, a god or spirits, or by witches and sorcerers” (5). Failure to recognise these beliefs, which form a core of the traditional African’s explanation of phenomenon or worldview can impede success of psychological interventions (Trimble, 2010). Wyrock and Paulson (2000)

maintained that counsellors should include conceptions of mental and psychological health that include cross-cultural systems which clients bring into the counselling process. They argued that “in order for assistance to be effective, the counsellor needs, among other things, to understand the clients’ worldview” (14) because it has a bearing on client’s acceptance of and involvement in the process.

Addressing the inherent cultural biases in conventional counselling and psychotherapy, Yeh et al. (2004) suggested that Western conceptualisations “exclude individuals from interdependent cultures, whose values emphasize social connectedness, collectivistic relationships, and spiritual worldviews” (412). This study presupposes that failure to consider this inter-connectedness and inter-relatedness among the different aspect of an individual may limit the ability to respond holistically to the client’s total experience. Connectedness and inter-relatedness with one’s world or cosmos are seen as critical to one’s well-being, completeness and wholeness.

It is evident that Western and non-Western views about causation may have significant impact on clients’ perceptions of reality and the counsellor’s effectiveness in handling beliefs and manifestations of behaviour. Most conventional counsellors have limited experience with indigenous approaches to well-being and systems of care (Sue, 1999). Western approaches and interventions for addressing complex indigenous cultural manifestations of problems and inexplicable cases have proven to have minimal impact in solving the problems associated with cultural perceptions of reality (Lindell et al., 2004). Founded on different historical, cultural, and theoretical assumptions about human behaviour, the Western and indigenous Botswana helping systems, are bound to differ significantly in their intervention strategies. These assumptions are likely to influence the conceptualisation, diagnosis, and approach to the problem. There is also a need to integrate “variant models of health and spiritual wellness, including non-conventional methods [to] enhance assessments and treatments” (Prue and Voss, 2014:10).

Achieving well-being requires interventions that are congruent with the existing cultural conditions of the time. Notably, a client in Botswana may attribute the cause of their experience and well-being to both the physical and the metaphysical world. It is also clear that despite multicultural counselling and their indigenous cultural experience, counsellors need more training and re-orientation to practice within non-Western settings where clients present cultural beliefs and worldviews that reflect belief systems and practices that may be alien to conventional mental health practitioners.

Among the identified effective approaches to handling clients’ beliefs were that the counsellor must always respect clients’ beliefs and worldviews; utilise the client’s

belief system to explore the problem; and to seek immediate referral to other community resources. The data revealed that counsellors in Botswana strongly believe that it is important for a counsellor to respect and to appreciate the beliefs and worldviews of the client. There is need to caution against discrediting, dismissing the client's beliefs as unscientific, or even trying to reshape the client's worldview. Nonetheless, spending time trying to help a client change their beliefs would be futile and counterproductive. While this study showed that respecting the client's beliefs and worldviews is an important aspect for counselling clients, the challenge is on reconciling counsellors' personal values and strong religious beliefs with those of clients who may adhere to beliefs grounded on indigenous culture and worldviews.

## CONCLUSIONS AND IMPLICATIONS

Generally, most clients in Botswana upheld metaphysical views about causes their problems and supernatural powers that affected their lives. Witchcraft as a cause of one's problems remains the most pervasive belief in Botswana society. While most counsellors have misgivings about referring their clients to indigenous practitioners, there were those who expressed feelings that they were comfortable dealing with clients who espoused Christian beliefs because they shared the same worldview and values.

Most counsellors in Botswana find it difficult to handle cases associated with cultural belief systems, spiritual inclinations, and general supernatural manifestations. These counsellors attribute this difficulty to their limited cultural exposure and the culturally inappropriate training they received. The failure to make breakthroughs in most of the cases connected to belief systems resulted in premature termination or clients choosing not to return for future sessions. However, we must understand this failure to handle these beliefs within the context of a struggle that counsellors are going through in trying to address these culturally entrenched belief systems using techniques and approaches grounded in "modern Science" and Western philosophy about reality. Such approaches would be incompatible with explaining reality from the metaphysical realm. It would be difficult for a client guided by the religious-spiritual spheres to connect with a counsellor whose training and approach to a problem rejects their worldviews as irrational and unscientific. There is need for more research on implications of contemporary training on effectiveness of mental health practitioners in non-Western setting.

## CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

## REFERENCES

- Aceves JB (1974). *Identity, survival, and change: exploring social/cultural anthropology*. General Learning Press.
- Amanze JN (2002). *African traditional religions and culture in Botswana. A comprehensive textbook*. Pula Press.
- Asare M, Danuah SA (2017). The African belief system and the patient's choice of treatment from existing health models-the case of Ghana. *Acta Psychopathologica* 3(4):49.
- Barron EP (2010). Allergy and spirituality. *Journal of Pastoral Care and Counseling* 64(4):1-10.
- Bolten C (1998). *Healing knowledge and cultural practices in a modern Tswana village*. Williams College.
- Chiboola H (2020). *Theoretical Perspective of Traditional Counseling. In Counseling and Therapy*. IntechOpen.
- Creswell JW (1994). *Research design: Qualitative and quantitative approaches*. Sage Publications.
- Dembow JR, Thebe PC (2006). *Culture and customs of Botswana*. Greenwood Publishing Group.
- Eagle GT (2005). Therapy at the cultural interface: Implications of African cosmology for traumatic stress intervention. *Journal of Contemporary Psychotherapy*, 35 (2):199-209.
- Erasmus CJ (1977). Changing folk beliefs and the relativity of empirical knowledge. In D. Landy (Ed.), *Culture, disease, and healing: Studies in medical anthropology* (pp. 264- 273). Macmillan Publishing Co., Inc.
- Finker K (2004). Traditional healers in Mexico: The effectiveness of spiritual practices. In: U. P. Gielen, J. M. Fish, & J. G. Draguns (Eds.), *Handbook of culture, therapy, and healing* (pp. 161-174). Lawrence Erlbaum Associates, Publishers.
- Fox JR (1967). Witchcraft and clanship in Cochiti therapy. In J. Middleton (Ed.), *Magic, witchcraft, and curing. American museum sourcebooks in anthropology* (pp. 255-284). The Natural History Press.
- Francis ST (2004). The role of dance in a Navajo healing ceremonial. In U. P. Gielen, J. M. Fish, & J. G. Draguns (Eds.), *Handbook of culture, therapy, and healing* (pp. 135-149). Lawrence Erlbaum Associates, Publishers.
- Furlong Y, Finnie T (2020). Culture counts: the diverse effects of culture and society on mental health amidst COVID-19 outbreak in Australia. *Irish journal of psychological medicine* 37(3):237-426.
- Greenwood S, Airely R (2006). *The illustrated encyclopedia of witchcraft and practical magic*. Lorenzo Books.
- Kahissay MH, Fenta TG, Boon H (2017). Beliefs and perception of ill-health causation: a socio-cultural qualitative study in rural North-Eastern Ethiopia. *BMC Public Health* 17(1):1-10.
- Kurniawan AP (2018). Understanding cultural barriers in Counseling Psychology. *Social Health Perspectives*. <https://www.researchgate.net/publication/324829081>
- Laszlo E (1972). *The systems view of the world: The natural philosophy of the new developments in the sciences*. George Braziller.
- Liddell C, Barrett L, Bydowell M (2005). Indigenous representations of illness and AIDS in Sub-Saharan Africa. *Social Science and Medicine* 60(4):691-700.
- Liverpool J, Alexander R, Johnson M, Ebba EK, Francis S, Liverpool C (2004). Western medicine and traditional healers: Partners in the fight against HIV/AIDS. *Journal of the National Medical Association* 96(6):822.
- Merriam SB (1998). *Qualitative research and case study applications in education: Revised and expanded from Case Study Research in Education*. Jossey-Bass Publishers.
- Middleton J (1995). Spirit possession among the Lugbara. In J. Beattie & J. Middleton (Eds.), *Spirit mediumship and society in Africa* (pp. 220-231). The Routledge and Kegan Paul.
- Minas H, Klimidis S, Tuncer C (2007). Illness causal beliefs in Turkish immigrants. *BMC Psychiatry* 7(1):1-10.
- Nadel SF (1967). Witchcraft in four African societies: An essay in comparison. In C. S. Ford (Ed.), *Cross-Cultural Approaches. Readings In Comparative Research* (pp. 207- 218). HRAF Press.
- Nuttgens SA, Campbell AJ (2010). *Multicultural considerations for*

- counselling First Nations' Clients. *Canadian Journal of Counselling*. 44(20):115-129.
- Patton MQ (2002). *Qualitative research and evaluation methods* (3<sup>rd</sup> ed.). Sage Publications.
- Prue R, Voss RW (2014). Indigenous healing practice: Ayahuasca. Opening a discussion. *Journal of Pastoral Care and Counseling* 68(1):1-13.
- Robertson LH, Holleran K, Samuels M (2015). Tailoring university counselling services to Aboriginal and international student centres at a Canadian university. *Canadian Journal of Higher Education* 45(1):122-135.
- Seidman IE (1991). *Interviewing as qualitative research: A guide for researchers in education and the social sciences*. Teachers College Press.
- Statistics Botswana (2018). Botswana demographic survey report 2017. ISBN No. 978-99968-2-046-5. [www.statsbots.org/bw/sites/default/files/publications/botswana](http://www.statsbots.org/bw/sites/default/files/publications/botswana)
- Staugård F (1985). *Traditional medicine in Botswana: Traditional healers*. Ipelegeng Publishers.
- Sue DW (1999). Advocacy and indigenous methods of healing. ERIC 142-149. ED435919.
- Subrick R (2006). AIDS and traditional belief: How an inappropriate AIDS prevention strategy undermined Botswana's health. Campaign for fighting diseases. International Policy Network. [http://www.fightingdiseases.org/pdf/subrick\\_AIDS.pdf](http://www.fightingdiseases.org/pdf/subrick_AIDS.pdf)
- Thomas J, Al-Qanini N, Furber SW (2015). Conceptualizing mental health in the United Arab Emirates: The perspectives of traditional healers. *Mental Health, Religion and Culture* 18(2):134-145.
- Togarasei L, Mmolai S, Kealotswe O (2016). 'Quinine', 'Ditaola' and the 'Bible': Investigating Botswana health seeking practices. *Journal for the Study of Religion* 29(2):95-117.
- Trimble JE (2010). Bear spends time in our dreams now: Magical thinking and cultural empathy in Multicultural Counselling theory and practice. *Counselling Psychology Quarterly* 23(3):241-253.
- Yeh CJ, Hunter CD, Madan-Bahel A, Chiang L, Arora AK (2004). Indigenous and interdependent perspectives of healing: Implications for Counseling and research. *Journal of Counseling and Development* 82(4):410-419.
- Van Dyk AC (2001). "Why me and not my neighbour?" HIV/AIDS care and Counselling in a traditional African context. *Curatoris* 24(3):4-11.
- White P (2015). The concept of diseases and health care in African traditional religion in Ghana. *HTS: Theological Studies* 71(3):1-7.
- Wolf A (2001). AIDS, morality and indigenous concepts of sexually transmitted diseases in Southern Africa. *Afrika Spectrum* 36(1):97-207.



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