Data Article

SURVEY OF UNREPORTED PSYCHIATRIC MORBIDITY INDUCED BY JOB DISSATISFACTION AMONG TEACHERS: INFERENTIAL POINT OF VIEW

Abstract. Elegant statistical methods for categorical data analysis are rapidly evolving and being adopted, particularly for biomedical and social sciences data analysis. This study presents a case study for the application of the discrete Johnson systems of distribution approach for the analysis of secondary school teachers' job satisfaction. This new approach accommodates relative frequency behavioural patterns in the analysis of categorical data using the entropy measure of discrete Johnson systems of distribution (DJSD). The approach offers a better alternative to the existing chi-square and likelihood ratio tests because it captures more shared information compared to known measures of association. Further examples were used to illustrate the applicability of the approach and enhance its reproducibility.

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Key words and phrases: Psychiatric morbidity, job (dis)satisfaction, teachers, discrete Johnson system distribution, inferential properties, entropy.

1. Introduction

Reported cases of students' abuse, molestation and administration of corporal punishment to correct erring students is a global issue with abounding evidence that most of the reported incidences can be traced to persistent and unchecked prolonged job dissatisfaction (Buckmam and Pittman, 2021). Job dissatisfaction could degenerate into the transfer of aggression,

a persistent feeling of low self-worth and general lethargy in an individual, which If left unchecked, could result in partial or full-scale mental illness as a result of the damage done to the teacher's moral psyche. The major problem here is that this influence of job dissatisfaction on mental health is usually not noticeable until when it starts to impair job performance, relationship with students and ability to sustain various pressure from employers, customers, students and co-workers (Extremera et al., 2020; De-Sousa et al., 2019; Oshio, 2021). It is expedient if this mental stress is checked regularly because the current trends of working conditions, where work overload is inevitable, may be eroding the level of job satisfaction by damaging the physical and mental health of employees (Stocks et al., 2010; Qiu et al., 2021). In fact, workers who reported satisfaction with their work are healthier than those who are dissatisfied (Hoogendoorn et al., 2002; Ofili et al., 2004; Akiomi et al., 2008). However, since it is not all workers that experience job dissatisfaction that usually end up with mental challenges. Several cases of gradually growing suspected mental issues are often not detected early enough for quick intervention (Extremera et al., 2020; De-Sousa et al., 2019; Oshio, 2021; Ching-Mei et al., 2022). The DJSD considered for the analysis of some categorical data was introduced by Soyinka and Olosunde (2022). It is very useful in analysing some categorical or contingency table data because of the flexibility to accommodate skewness, excess kurtosis and bimodality. This is made possible by the extra parameters that generalized the discrete distributions. In experimental studies, the data are either lighter or thicker in tails with either higher or lower kurtosis than the presumed distributional assumptions which discrete-type random variables could adequately address. This necessitated the search for the discrete-type continuous random variable, that will: have the existing ones as special cases; simultaneously account for the skewness and kurtosis in any discrete cases; account for bimodality often encountered in discrete cases, and be better appealing in the analysis of categorical data. The discrete-type DJSD, whose random variable (rv) had been defined from various transformations of normal variates, provides a solution to aforementioned challenges in discrete data analysis; see Soyinka and Olosunde, (2022) for further Statistical theory.

2. Important Features of DJSD for Applications

The use of chi-square and likelihood ratio in categorical and contingency data (relative frequency) analysis is restricted to inferential decisions, and so, it is often unreliable due to the dynamics in some recent experimental data. In this regard, this study employed a more advanced and flexible approach (Soyinka and Olosunde, 2022) to the analysis of categorical and contingency data using the inferential properties of the DJSD. The mathematical properties, parameter estimation and Other inferential properties for the univariate and the bivariate DJSD was determined in the same paper. he analysis of directionless discrete data in categorical form and directional discrete data in contingency form. Some estimated parameters such as the; $\hat{\beta}$, $\hat{p}$, $\hat{q}$, $r_{\hat{x},y}$, $N\hat{L}_{x,y}$ as well as covariance ($\mu_{\hat{x},y}$), mean ($\hat{\mu_x}, \hat{\mu_y}$), variance ($\hat{\sigma_x^2}, \hat{\sigma_y^2}$), skewness ($\hat{\alpha_3}$) and kurtosis ($\hat{\alpha_3}$) are all that is required to completely describe the inferential implication(s) of the relative frequencies. The practical implication of some of the important parameters are defined as follow:

i. $\hat{\beta}$ is the shape parameter and is the measure of the behavioural pattern of the relative frequencies in the categorical or contingency outfit. The pattern assume normal distribution when $\hat{\beta} = 1$ and thus uses existing methods at that point. In this paper, $\hat{\beta} \in \Re$ and so its more general and advantageous.
ii. $\hat{p}$ is the measure of the average proportion in a population that truly experiences the specified event understudy. That is, $\hat{p}$ is the segment in a population (N) that has the required knowledge at an average; when knowledge is rated over a likert scale.
iii. $\hat{q}$ is the proportion in a population that has the odds or tendency to experience the specified event understudy. Note that a group of respondent may be expected to possess the odds to have a knowledge about something, but when their knowledge is rated over a likert scale, they, may or may not, possess the adequate knowledge.
iv. $r_{\hat{x},y}$ is the measure of linear association (correlation) between two discrete variables interwoven into a contingency platform. It measures the proportion in a population (N) that experiences changes as the two interacting discrete variables are changing direction by stepping forward (backward) correspondingly.
v. $N\hat{L}_{x,y}$ is the measure of non-linear dependence or association between two discrete variables arranged into a contingency outfit. It measures the proportion in a population (N) that experiences changes as the two interacting discrete variables are changing direction haphazardly.

TABLE 1. Preliminary Descriptive Statistics of SCD, JS and disease status interaction

Morbidity	+			+	-			-	JS	Low	Average	High
SCD	GHQ	DE	GAD	SOMD	GHQ	DE	GAD	SOMD	SCD			
AGE								AGE				
20-30	14(22.6)	8(57.1)	8(57.1)	8(57.1)	48(77.4)	6(42.9)	6(42.9)	6(42.9)	20-30	19(30.6)	26(41.9)	17(27.4)
31-40	31(18.8)	10(32.3)	10(32.3)	10(32.3)	134(81.2)	21(67.7)	21(67.7)	21(67.7)	31-40	42(25.5)	78(47.3)	45(27.3)
41-50	22(17.3)	11(50)	10(45.5)	7(31.8)	105(82.7)	11(50)	12(54.5)	15(68.2)	41-50	29(22.8)	63(49.6)	35(27.6)
≥ 51	9(23.1)	5(55.6)	3(33.3)	4(44.4)	30(76.9)	4(44.4)	6(66.7)	5(55.6)	≥ 51	11(28.2)	21(53.8)	7(17.9)
Gender									Gender			
Female	59(19.5)	25(42.4)	24(40.7)	23(39)	243(80.5)	34(57.6)	35(59.3)	36(61)	Female	75(24.8)	150(49.7)	77(25.5)
Male	17(18.7)	9(52.9)	7(41.2)	6(35.3)	74(81.3)	8(47.1)	10(58.8)	11(64.7)	Male	26(28.6)	38(41.8)	27(29.7)
MS									MS			
Unmarried	19(33.3)	10(52.6)	11(57.9)	11(57.9)	38(66.7)	9(47.4)	8(42.1)	8(42.1)	Unmarried	16(28.1)	24(42.1)	17(29.8)
Married	57(17.6)	24(42.1)	20(35.1)	18(31.6)	267(82.4)	33(57.9)	37(64.9)	39(68.4)	Married	81(25)	161(49.7)	82(25.3)
D/S/W	0(0)				12(100)				D/S/W	4(33.3)	3(25)	5(41.7)
EL									EL			
NCE/OND	18(23.7)	5(27.8)	4(22.2)	5(27.8)	58(76.3)	13(72.2)	14(77.8)	13(72.2)	NCE/OND	18(23.7)	33(43.4)	25(32.9)
DEG/HND	50(19.5)	25(50)	25(50)	21(40)	207(80.5)	25(50)	25(50)	30(60)	DEG/HND	67(26.1)	127(49.4)	63(24.5)
PG/M	8(13.3)	4(50)	2(25)		2(25)	4(50)	6(75)	6(75)	PG/M	16(26.7)	28(46.7)	16(26.7)
Number of Children									Number of Children			
No child	24(29.6)	11(45.8)	12(50)	13(54.2)	57(70.4)	13(54.2)	12(50)	11(45.8)	No child	22(27.2)	35(43.2)	24(29.6)
1-3	39(16.1)	16(41)	14(35.9)	11(28.2)	203(83.9)	23(59)	25(64.1)	28(71.8)	1-3	62(25.6)	115(47.5)	65(26.9)
≥ 4	13(18.6)	7(53.8)	5(38.5)	5(38.5)	57(81.4)	6(46.2)	8(61.5)	8(61.5)	≥ 4	17(24.3)	38(54.3)	15(21.4)
LS									LS			
1-8	42(21.1)	19(45.2)	17(40.5)	18(42.9)	157(78.9)	23(54.8)	25(59.5)	24(57.1)	1-8	56(28.1)	84(42.2)	59(29.6)
9-18	15(15)	5(33.3)	7(46.7)	4(26.7)	85(85)	10(66.7)	8(53.3)	11(73.3)	9-18	26(26)	50(50)	24(24)
≥ 19	19(20.2)	10(52.6)	7(36.8)	7(36.8)	75(79.8)	9(47.4)	12(63.2)	12(63.2)	≥ 19	19(20.2)	54(57.4)	21(22.3)
n	76(19.3)	34(44.74)	31(40.79)	29(38.16)	317(80.7)	42(55.26)	45(59.21)	47(61.84)	n	101	188	104

MS-Marital status; N-Never; NCE-Nigeria Certificate in Education; LS-Length of service;EL- Educational level;Higher (H) ND-National Diploma

DEG-Bachelor;PG/M-Post graduate diploma and Masters; (−) Possible disease absence; (+) Possible disease presence, JS-job satisfaction.

3. Data Collection and Analysis

The primary data collection was carried out by a team of researchers, comprising of psychiatrist and scientist during a community service tour across selected secondary schools in Ogun State South-West Nigeria. The team gave mental health talk to teachers and also provided free medical/mental attention on cases that can be addressed immediately while recommending appropriate referrals for cases that required further care. Using multi-stage sampling techniques, three hundred and ninety three (393) teachers in 9 randomly selected secondary schools were assessed. The first stage involved the administration of a questionnaire to elicit socio-demographic details, foll the Minnesota Satisfaction Questionnaire (MSQ) and the 28-item general health questionnaire (GHQ) to all consenting teachers to screen them for probable psychiatric disorders and job satisfaction level. In the second stage, respondents who were GHQ-positive and those who were GHQ-negative were further screened with M.I.N.I. International Neuropsychiatric Interview for ICD-10 axis -I-Diagnosis for the diagnosis of Depression Episode (DE), General Anxiety Disorder (GAD) and Somatization Disorder (SOMD). Some descriptive statistics obtained from the questionnaire administration of GHQ-28 show that; 317(80.7%) respondents scored ≤ 4, so these individuals were classified as having no psychiatric morbidity (GHQ-Negative). Seventy-six (19.3%) teachers scored ≥ 5 and so they were classified as probable psychiatric disorder (GHQ-Positive) with prevalence of 19.3%. Further screening via M.I.N.I. showed that, 8.7%(34), 7.9%(31) and 7.4%(29) were the respective prevalence for DE, GAD and SOMD; with some level of co-morbid cases as follow: 4(1.0%) teachers have DE and GAD, 5(1.3%) teachers have DE and SOMD and only one teacher (0.3%) have GAD and SOMD. Seventeen (4.3%) respondents have symptoms showing the presence of all the three disorders. In addition to this, about 6.8%(27) of the population did not have co-morbid cases. So, of the total GHQ-Negative and GHQ-Positive at the first screening, about 11(2.8%) and 9(2.3%) respondents turned out to be false negative and false positive respectively at the second screening; making the sensitivity value and the specificity value of the entire screening exercise to be 85.6% and 97.14% respectively. Other frequency-percentage interactions among SCD, job satisfaction (JS) and disorders (DE, GAD, SOMD) are presented in Table 1. Aside the experimental data reported in Table 1, this study also demonstrate the workability of the model using the data on the newspaper depictions of mental and physical health issues in United Kingdom as published by Chen and Lawrie (2017). The data which was captured for 763(79.2%) physical health cases and 200(20.8%) mental health cases, was factorized into two section. The first section was used to establish if there

is any bias in the reporting (Negative, Neutral and Positive) of physical and mental health issues. In the second section, the effort of the professionals at engaging the media adequately was considered.The result and test of hypothesis is presented in Table 7.

4. Results and Discussion

From the univariate DJSD, the $\hat{p}$ and the $\hat{q}$ parameters will be used to determine the test of significance difference and the odds ratio, between categorical groups using generalized hotelling T-square test-statistic (Soyinka and Olosunde, 2021) and the D statistic (Soyinka and Olosunde, 2022) respectively. Similarly, $r_{\hat{x},y}$ and $N\hat{L}_{x,y}$ will be used to better understand the implication of the inferential properties from bivariate DJSD. Information from Table 1 will be used to investigate the:

i. Changes in the health status of teachers as their age, family size and LS is increasing;
ii. Changes in the health status of teachers based on gender and marital status;
iii. Influence of age, family size and length of service on JS; and
iv. Influence of gender and marital status on JS.

Item (i) was addressed by analyzing the frequency observation in Table 2.

Table 2.

	GHQ	GHQ	DE	DE	GAD	GAD	SOMD	SOMD
Age	-	+	-	+	-	+	-	+
20-30	48	14	6	8	6	8	6	8
31-40	134	31	21	10	21	10	21	10
41-50	105	22	11	11	12	10	15	7
≥ 51	30	9	4	5	6	3	5	4
Family size								
1-3	203	39	23	16	25	14	28	11
≥ 4	57	13	6	7	8	5	8	5
LS								
1-8	157	42	23	19	25	17	24	18
9-18	85	15	10	5	8	7	11	4
≥ 19	75	19	9	10	12	7	12	7

The bivariate inferential result of objective (i) is presented in Table 3. The findings from Table 3, revealed that $65\% - 69\%$ of the entire population has the odds of suffering from at least one of the diseases, with an average of $15\% - 21\%$ of the population currently experiencing health challenges within the interval $0.73\% - 42\%$ due to aging, increase in family size and increase in length of service. The minimal spread of disease status which is 1.46 ± 2.39 with that of age, family size and LS $(1.46 \pm 3.41, 2.14 \pm 2.74, 2.194 \pm 2.66)$, showed that no age group or family is immune against health challenges as the LS is increasing. This agrees with the findings of Sadock and Sadock, 2003; and Johnston et al., 2010; who established psychiatric disorders in

Table 3.Inferential results for age, family size and LS with disease status

Age	GHQ	DE	GAD	SOMD	family size	GHQ	DE	GAD	SOMD	LS	GHQ	DE	GAD	SOMD
$\hat{\beta}$	1.8919	1.8988	1.8997	1.9	$\hat{\beta}$	1.8634	1.8947	1.8958	1.8965	$\hat{\beta}$	1.8726	1.857	1.8592	1.8607
$\hat{q}$	0.6913	0.69	0.6905	0.6908	$\hat{q}$	0.6615	0.6585	0.6589	0.6591	$\hat{q}$	0.6478	0.6437	0.6442	0.6443
$\hat{p}$	0.1916	0.2195	0.2167	0.2118	$\hat{p}$	0.1656	0.168	0.1686	0.1678	$\hat{p}$	0.1455	0.1523	0.1518	0.1521
$\hat{\mu_{x,y}}$	7.179	6.8393	6.8787	6.9469	$\hat{\mu_{x,y}}$	5.4922	5.5334	5.5293	5.5363	$\hat{\mu_{x,y}}$	5.6833	5.626	5.6315	5.6309
$\hat{\mu_x}$	1.547	1.4613	1.4705	1.4869	$\hat{\mu_x}$	1.6437	1.6585	1.657	1.66	$\hat{\mu_x}$	1.7186	1.6942	1.6965	1.6962
$\hat{\sigma_x^2}$	5.694	6.177	6.128	6.0335	$\hat{\sigma_x^2}$	4.8974	4.7628	4.7723	4.76	$\hat{\sigma_x^2}$	4.4069	4.5196	4.51	4.511
$\hat{\mu_y}$	1.547	1.4613	1.4705	1.4869	$\hat{\mu_y}$	2.1437	2.1585	2.157	2.1595	$\hat{\mu_y}$	2.2186	2.1942	2.1965	2.1962
$\hat{\sigma_y^2}$	11.6	12.254	12.187	12.06	$\hat{\sigma_y^2}$	7.5037	7.3543	7.3653	7.3502	$\hat{\sigma_y^2}$	6.9382	7.0754	7.0631	7.0647
$\hat{r_{x,y}}$	0.1104	0.0983	0.0995	0.1018	$\hat{r_{x,y}}$	0.151	0.1558	0.1554	0.156	$\hat{r_{x,y}}$	0.1713	0.1658	0.1663	0.1662
95% CI	0.0096	0.011	0.011	0.011	95% CI	0.0083	0.0084	0.00843	0.0084	95% CI	0.0073	0.0076	0.0076	0.0076
for $\hat{p}$	0.3736	0.428	0.4226	0.413	for $\hat{p}$	0.3229	0.3276	0.3288	0.3272	for $\hat{p}$	0.2837	0.297	0.296	0.2966
D_{χ^2}	0.4451	0.1879	0.2043	0.2124	D_{χ^2}	0.256	0.1028	0.1116	0.1199	D_{χ^2}	0.2791	0.1293	0.1231	0.1613
p-value	0.9308	0.9795	0.9769	0.9756	p-value	0.968	0.9915	0.9904	0.9894	p-value	0.9639	0.9881	0.9889	0.9836
D_{LR}	0.8005	0.6921	0.6811	0.7128	D_{LR}	0.7369	0.454	0.4697	0.5231	D_{LR}	0.6319	0.5394	0.56	0.5399
p-value	0.8494	0.8751	0.8776	0.8702	p-value	0.8645	0.929	0.9255	0.9138	p-value	0.8891	0.9102	0.9055	0.91
D_{DJSD}	1.3683	0.9098	0.9252	0.9586	D_{DJSD}	1.0612	0.571	0.6	0.6613	D_{DJSD}	0.9883	0.6887	0.699	0.7337
p-value	0.713	0.8231	0.8193	0.8113	p-value	0.7865	0.9030	0.8966	0.8823	p-value	0.8041	0.8758	0.8735	0.8653
C_{χ^2}	0.2296	0.1515	0.1578	0.1608	C_{χ^2}	0.2023	0.1298	0.1351	0.14	C_{χ^2}	0.2108	0.1452	0.1418	0.1618
C_{LR}	0.3016	0.2822	0.2801	0.286	C_{LR}	0.3307	0.2652	0.2694	0.2832	C_{LR}	0.3087	0.2872	0.2922	0.2873
C_{DJSD}	0.3822	0.3195	0.322	0.3271	C_{DJSD}	0.3877	0.2948	0.3013	0.3151	C_{DJSD}	0.3761	0.3209	0.323	0.33
V_{χ^2}	0.1362	0.0885	0.0923	0.0941	V_{χ^2}	0.1461	0.0926	0.0964	0.1	V_{χ^2}	0.1525	0.1038	0.1013	0.1159
V_{LR}	0.1826	0.1698	0.1695	0.1723	V_{LR}	0.2478	0.1945	0.1978	0.2088	V_{LR}	0.2295	0.212	0.216	0.2121
V_{DJSD}	0.2388	0.1947	0.1963	0.1998	V_{DJSD}	0.2974	0.2181	0.2234	0.2348	V_{DJSD}	0.287	0.2396	0.2413	0.2473
$\hat{NL}_{x,y}$	0.6026	0.7248	0.7199	0.7095	$\hat{NL}_{x,y}$	0.6355	0.7472	0.7412	0.7263	$\hat{NL}_{x,y}$	0.6328	0.71	0.7071	0.699

women has their family size grows while still in service. The study thus revealed that for every step increase in age group, family size and LS; there is corresponding proportion of about $9\% - 18\%$ of the teachers population that comes down with health problems. Overall as age, family size and length of service is increasing, a time is coming when a proportion of about $60\% - 74\%$ of the entire teachers population would be experiencing health challenge(s). This implies that over a working life time, a little above 30% of the teaching work force, will escape health challenges induced by aging, family size and unhealthy prolonged LS. Secondly; item (ii) was obtained from the frequency observation in Table 4. The inferential properties of the association in objective (ii) which is presented in Table 5, revealed that, approximately an average of $38\% - 43\%$ of the female and male teachers from the total population are suffering health challenge(s). This challenge has the tendency to spread, since $\alpha_3 > 0$ and $\alpha_4 > 0$, from 2.5% of the total population to the entire population. Implying that health challenge, is not a respecter of gender. In confirmation of the aforementioned, the tendency of having health challenge ($GHQ \geq 5$) and suffering GAD by the female and the male teachers is $\hat{q}_{ratio} = 1$. That is both the female and male teachers can suffer illness and anxiety disorder at equal rate.

Table 4.

	GHQ	GHQ	DE	DE	GAD	GAD	SOMD	SOMD
Gender	-	+	-	+	-	+	-	+
Female	243	59	34	25	35	24	36	23
Male	74	17	8	9	10	7	11	6
MS								
Unmarried	38	19	9	10	8	11	8	11
Married	267	57	33	24	37	20	39	18

The odds of suffering DE and SOMD was however more in one gender compared to the other. This follows the suggestion of Arogundade and Itua (2010), that men differ from women when organization frustration are compared. The odds to suffer SOMD is 1.16 times higher in female teachers compared to their male counterpart. Similarly, male teachers odds of suffering DE, is 1.2 times higher than that of their female folks. In a similar manner to that of gender, since marital status is directionless as gender is, an average of $38\% - 44\%$ of teachers who are unmarried and those who are married suffers both medical ($GHQ \geq 5$) and mental disorder. This percentage however has the tendency to grow beyond 2.47%, since $\hat{\alpha_3} > 0$ and $\hat{\alpha_4} > 0$ to 100%. Table 5 further showed that the odds that teachers who are unmarried will experience health challenges and suffers DE, GAD and SOMD are respectively 2.0, 1.18, 1.49 and 1.63 times higher than that of their counterparts who are married. This implies that teachers who are yet to marry suffers a more medical and mental imbalance that needs to be regularly assessed and support systems introduced.

Table 5.Inferential properties of Gender and MS with probable disorder

	GHQ	GHQ	DE	DE	GAD	GAD	SOMD	SOMD	GHQ	GHQ	DE	DE	GAD	GAD	SOMD	SOMD
	Female	Male	Female	Male	Female	Male	Female	Male	Unmarried	Married	Unmarried	Married	Unmarried	Married	Unmarried	Married
$\hat{\beta}$	1.0420	1.0663	1.0344	1.0225	1.0367	1.0136	1.039	1.0173	1.0485	1.0461	1.0147	1.0347	1.015	1.045	1.015	1.0534
$\hat{q}$	0.0483	0.0493	0.1068	0.1277	0.1032	0.0992	0.0995	0.0857	0.087	0.0436	0.125	0.1062	0.1356	0.0909	0.1356	0.0833
$\hat{p}$	0.3881	0.3961	0.4087	0.4237	0.4070	0.3995	0.4055	0.3930	0.4018	0.3885	0.4203	0.4084	0.4326	0.4026	0.4326	0.4017
$\hat{\mu_x}$	1.4974	1.501	1.4059	1.3657	1.4125	1.4105	1.4191	1.4337	1.4415	1.5053	1.3668	1.4069	1.3477	1.4345	1.3477	1.4485
$\hat{\sigma_x^2}$	2.9	2.9155	2.4125	2.1585	2.4517	2.4402	2.4904	2.573	2.6159	2.9362	2.1662	2.4187	2.0343	2.5775	2.0343	2.6538
$\hat{\alpha_3}$	2.3274	2.3189	2.5929	2.7481	2.5702	2.5768	2.5481	2.5017	2.478	2.3082	2.7431	2.5893	2.8303	2.4992	2.8303	2.4573
$\hat{\alpha_4}$	4.5455	4.5044	5.9948	7.01	5.8576	5.8973	5.7262	5.4589	5.3263	4.4532	6.9757	5.9727	7.6063	5.4446	7.6063	5.2129
95% CI	0.033	0.032	0.0262	0.025	0.0264	0.0275	0.0267	0.0287	0.0275	0.034	0.0254	0.0262	0.0247	0.0273	0.0247	0.0278
$\hat{p}$	1.0	1.0	1.0	0.9757	1.0	1.0	1.0	1.0	1.0	1.0	0.9925	1.0	0.9647	1.0	0.9647	1.0
D_{χ^2}	1.2906	1.3209	0.595	0.364	0.6372	0.6247	0.681	0.7814	0.8379	1.3593	0.3702	0.6016	0.2744	0.7873	0.2744	0.8902
p-value	0.7314	0.7242	0.8976	0.9475	0.8879	0.8908	0.8777	0.8539	0.8404	0.7151	0.9463	0.8961	0.9648	0.8525	0.9648	0.8278
D_{LR}	1.3861	1.3782	1.2088	0.9793	1.2392	1.2304	1.2674	1.3214	1.3454	1.3656	0.9869	1.2138	0.8503	1.3241	0.8503	1.3639
p-value	0.7088	0.7107	0.7509	0.8063	0.7436	0.7457	0.7369	0.724	0.7184	0.7136	0.8044	0.7497	0.8374	0.7234	0.8374	0.714
D_{DJSD}	0.7255	0.7133	0.7948	0.7006	0.8033	0.801	0.81	0.8174	0.8175	0.6964	0.7044	0.7963	0.6323	0.8176	0.6323	0.8151
p-value	0.8672	0.87	0.8507	0.8731	0.8487	0.8492	0.8471	0.8453	0.8453	0.874	0.8722	0.8504	0.889	0.8453	0.889	0.8458

difficult to curtail. This is in agreement to the study of Clifford et al, 1999; where it was noted that unmarried respondents have some unresolved conflicts that are usually aggravated by intimacy and isolation problems. On the influence of educational qualification on disease status; though the result obtained is similar to that of objective (ii), the odds of education qualification inducing health problems is not pronounced. Hence, the presentation of inferential properties due to educational qualification and disease status was ignored to save space. Next we address items (iii) and (iv), using bivariate and univariate DJSD respectively. The result of the association between age, family size, LS and EL with JS, and that of gender and marital status with JS, is presented in Table 6.

Table 6. Inferential properties of the association between JS and SCD

JS	Age	family size	LS	EL
$\hat{\beta}$	1.8435	1.8509	1.8452	1.8502
$\hat{q}$	0.6479	0.6219	0.6255	0.6208
$\hat{p}$	0.1039	0.1059	0.0987	0.1057
$\hat{\mu_{x,y}}$	11.852	8.8788	8.8972	8.8673
$\hat{\mu_x}$	1.3075	1.3259	1.3397	1.3178
$\hat{\sigma_x^2}$	6.4152	6.2175	6.1526	6.258
$\hat{\mu_y}$	1.8075	1.3259	1.3397	1.3178
σ_y^2	9.3577	6.2175	6.1526	6.258
$r_{\hat{x,y}}$	0.1275	0.1587	0.1607	0.1574
95% CI	0.0052	0.0053	0.005	0.0053
for $\hat{p}$	0.2026	0.2065	0.1925	0.2061
D_{χ^2}	0.978	0.6048	0.4827	0.6604
p-value	0.8066	0.8953	0.9227	0.8825
D_{LR}	2.3293	1.6489	1.5959	1.6776
p-value	0.507	0.6484	0.6603	0.6419
D_{DJSD}	3.6151	2.4124	2.1902	2.5171
p-value	0.3061	0.4913	0.5339	0.4722
C_{χ^2}	0.2745	0.2509	0.2256	0.2615
C_{LR}	0.4032	0.3935	0.3881	0.3964
C_{DJSD}	0.4812	0.4598	0.4424	0.4675
V_{χ^2}	0.1648	0.1833	0.1638	0.1915
V_{LR}	0.2544	0.3027	0.2978	0.3053
V_{DJSD}	0.3169	0.3661	0.3488	0.3739
$N\hat{L}_{x,y}$	0.1787	0.3327	0.3732	0.3148

JS	Female	Male	N/Married	Married
$\hat{\beta}$	4.2282		3.9234	4.7645
$\hat{q}$	0.0352		0.0282	0.0268
$\hat{\mu_{x,y}}$				
$\hat{\mu_x}$	1.4113		1.3907	1.4355
$\hat{p}$	0.4336		0.3952	0.4016
$\hat{\sigma_x^2}$	5.4195		5.4566	5.3748
$\hat{\alpha_3}$	2.4897		2.4627	2.5228
$\hat{\alpha_y}$	4.3381		4.2785	4.4114
$r_{\hat{x,y}}$				
95% CI	0.026		0.03	0.025
for $\hat{p}$	1.0		1.0	0.97
D_{χ^2}	NR		NR	NR
p-value	< 0.05		< 0.05	< 0.05
D_{LR}	NR		NR	NR
p-value	< 0.05		< 0.05	< 0.05
D_{DJSD}	2.0839		2.1633	2.0837
p-value	0.5552		0.5392	0.5552

NR-Not reliable for $p < 0.05$

From result obtained for item (iii), though almost $62\% - 65\%$ of the teachers population are expected to have good JS, unfortunately the result of the study showed that only $9.87\% - 10.59\%$ of the entire teachers population at an average experience good JS irrespective of changes in their age, number of children and LS within the interval $0.5\% - 21\%$. Similarly, the $r_{x,y}$ value revealed that a proportion of $12\% - 16\%$ of the teachers have good JS as age, number of children and LS are increasing linearly. The highest proportion of teachers with good JS was obtained as 37.32% via $NL_{x,y}$. Confirming that more than 60% of the teachers experience

various degree of job dissatisfaction. This high job dissatisfaction is a dangerous trend that should be reversed, if mental problems induced by job dissatisfaction is to be prevented in the nearest future. Recall that this finding was earlier confirmed in the inferential results of age, family size and LS influence on probable mental disorder, see Table 3, where almost $60\% - 74\%$ of the teachers population are prone to suffer from at least one of the diseases during their teaching career. Finally, though not so significant in terms of $\hat{q}_{ratio}$, the influence of JS on gender and MS indicates that both female and male teachers, either married or unmarried, experiences job (dis)satisfaction at the same rate. In table 7 using the univariate DJSD approach in the comparison of frequency outputs from newspaper reports on physical and mental cases, though there is significance difference in the reporting of physical and mental health matters $T^2 = 0.1607$, $P_(value) = 0.0163$, in-terms of Negative, Neutral and positive reports, as more physical health reports were captured compared to that of mental health reports, this low pace of mental health report, cannot be expressly blamed on the mental health professionals. This significant bias in reporting is in agreement to the findings of Chen and Lawrie (2017). Hence the trend should be loooked into. On the other hand, despite the fact that the rate of engagement of the media by the physical health professionals is 1.47 times higher than that of the mental health professionals; this ratio influence giving advantage to the professionals in the physical health, was however not significantly different from that of its mental health counterparts $T^2 = 0.4701$, $P_{value} = 0.0746$. So it is important that newspaper editors should confirm information from mental health care provider before publishing any story on the mental health.

Table 7. Investigating the significance of Newspaper depiction on health

Variables	P	M		P	M	P	M
Section 1			$\hat{b}$	0.9884	1.0134	0.9394	0.7422
Negative	251	101	$\hat{p}$	0.3984	0.3714	0.3758	0.9906
Neutral	290	55	$\hat{q}$	0.2324	0.1947	0.3988	0.2716
Positive	218	44	$\hat{\mu}$	1.6811	1.7772	2.2767	1.4077
Section 2	P	M					
Charity Quote	150	45	$\hat{\sigma^2}$	3.7918	4.4932	7.6405	4.6458
Professional Quote	285	58	$\hat{\alpha_3}$	2.7604	2.5462	3.0023	4.8153
Mention of treatment	217	48	$\hat{\alpha_4}$	6.8432	5.5124	7.5113	18.334
Awareness	131	26	CI	0.021	0.0218	0.0185	0.0309
Innovations	184	22	CI	0.8229	0.8489	0.7201	1.0
T^2				0.1607	(0.0163*)	0.4701	(0.0746)

Physical-P, Mental-M, *Significant < 0.05.

5. Conclusion

In summary, though the harm done by job dissatisfaction to the health of teachers is silent and gradual, that is the significant difference and the $\hat{q}_{ratio}$ of JS between groups of no morbidity to the group of known morbidity is not obvious '$T^{2\beta} < 0.1$, $p_{value} > 0.05$, $\hat{q}_{ratio} = 1.01$', its significant effect is high as more than 60% of the teachers will be victims of medical and/or mental disorder due to job dissatisfaction before the end of their teaching career. This unfriendly trend should be a course of worry to the government and the society. The society needs not risk having a larger percentage of its elders population suffering medical and/or mental problems. This study thus recommend that something should be done to address the problem of job dissatisfaction among teachers at all levels of education (primary, secondary and tertiary) by providing incentives to boost job satisfaction.Also, the study established that about $37\% - 40\%$ of the stories published on mental health are bias, so the trend should be addressed by allowing for experts opinion to put issues on the right perspective before publishing.

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