Original Research Article

COVID anxiety among Frontline Health care workers in a COVID care center: A hospital based study

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ABSTRACT

Context: The spread of COVID 19 throughout the world has strained many aspects of human day to day activity. One sector which has been working untiringly since the pandemic emerged is health care sector.
Aims: So the study was planned to assess the anxiety, stress and work & social adjustment and factors influencing the same.
Settings and Design: This was hospital based study carried out for period of 4 months from July to October 2020 in a Covid Care center, Kolar.
Materials and Methods: Study participants were frontline health care workers (FLHCW) like doctors and nurses who were part of Covid care of patients who had not contracted the infection, working in COVID related wards and Out-patient department. Sample size was calculated based on previous study which was 360.
Statistical Analysis used: Descriptive statistics applied where ever needed and to check for association between factors Chi-square was applied with level of significance defined as p value less than 0.05. Multinomial logistic regression was done to identify the factors.
Results: Out of 362 FHCWs, 142(39.2%) belonged to age group of 21-25 years, 243(67.1%) were female FHCW, 86(23.8%) were Junior Residents, 105(29%) were working in COVID ward, 187(51.7%) were working more than 8 hours,189(52.2%) Perceived their workload during COVID duties as medium, 265(73.2%) followed Regular working Shifts followed during COVID. Out of 362 FLHCWs, 45 (12.4%) had high stress. With respect to work and social adjustment, severe psychopathology was seen in 178(49.2%) and 196(54.1%) had Corona anxiety.
Conclusions: Gender, occupation and marital status were found to have statistically significant association with work and social adjustment. Working hours per day, occupation, perceived workload during duties, regular shits during Covid duties and hours of rest during Covid duties were few factors which were found to have statistically significant association with Corona anxiety.
Key Messages: The present study stresses the importance of recognizing the psychological consequences of the newer disease outbreaks among health care workers working in treating center being very crucial but still failed to be taken care by guiding policies and hospital authorities to maintain healthy psychological well-being. Health institutions addressing such pandemics need to regularly screen FLHCWs for mental health issues and intervene at early so as to keep the health worker resource adequate to fight the pandemic till the advent of vaccine or curative drug.

1. Introduction

One sector which has been working since the pandemic started is sector involving health care workers risking their own life. Frontline health care workers are those who come in first contact with cases of COVID-19 in a hospital posing them to greater risk of contracting infection. FLHCWs are facing lengthy work schedules, no regular shifts, less resting hours and staying far from the
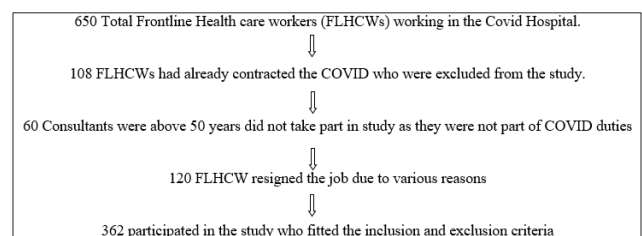
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family due to mandatory quarantine post Covid duties, inadequate personal protective equipment have added more to psychological issues of health care workers.[1] According to World Health Organization (WHO), natural psychological responses to fast spreading virus, difficulty in predicting the course of infection, fear of re-infection of COVID 19 has caused universal awareness regarding prevention but also sometimes unexplained anxiety and unneeded distress among health care workers.[2] Contracting infection among health care has added more to the feelings of anxiety, helplessness, loneliness, guilt and resultant insomnia prodigiously affecting their mental health.[3] Frontline health care workers are at very high risk of contracting infection which itself acts as stressor affecting mental wellbeing. They are exposed to viral disease which has been negligibly retorted at least by Personal protective equipment's but the mental health have no protective barriers as many COVID 19 treating hospitals have negligibly addressed on coping skills among frontline health care workers which is very much needed to intercept adverse mental health issue.[4] There is no central guidance or government plan to intervene and organize operations to provide timely diagnosis and appropriate treatment for healthcare workers at risk of deterioration of psychological status working specially during pandemic times.[5] Pandemics can lead to heightened levels of Stress and Anxiety is a common response to any stressful situation.[6] So the study was planned to assess the Anxiety, Work & Social adjustment and stress and factors influencing the same.

2. Materials and Methods

This was hospital based study carried out for period of 4 months from July 2020 to October 2020 in R.L. Jalappa Hospital and Research Center converted to Covid Care center, Sri Devaraj Urs Medical College, Kolar. Study was carried on the participants who were frontline health care workers (FLHCW), part of Covid care of patients diagnosed with Covid infection through RT-PCR. Frontline health care workers in the present study were Doctors and Nurses. All FLHCW who had not contracted the Covid infection, FLHCWs working in COVID related wards and Out-patient department were included in the study. Study participants who have already contracted the COVID disease were excluded from the study. To assess socio-demographic profile pretested semi-structured questionnaire was used. To assess perceived stress, Cohen's' Perceived stress scale was used which is a likert scale. It is a psychological instrument for measuring the perception of stress. It measures the degree to which situations in one's life are appraised as stressful. Cut off for Low stress was 0-13, Moderate stress was 14-26 and High stress was 27-40.[7] To assess how COVID affecting the ability to carry on day to day activities, Work and Social Adjustment Scale (WSAS) was used. This

is a likert scale with maximum total score being 40. Lesser the scores are better. A WSAS score above 20 appears to suggest moderately severe or worse psychopathology. Score between 10 and 20 are associated with significant functional impairment and scores less than 10 to be associated with subclinical population.[8] To assess anxiety, Corona Anxiety Scale (CAS) developed by Sherman Lee at al was used. The CAS is a 5-item mental health screener designed to efficiently and effectively aid healthcare professionals and researchers identify probable cases of dysfunctional anxiety associated with the COVID-19 crisis and cut score of ≥9 was considered in the present study.[9] The sample size was calculated by n Master Version 2.0, CMC Vellore, Tamil Nadu, India with prevalence of 35.2% with 5% error 95% confidence level which was 353 rounded off to 360.[10] Data were collected by sending the link through electronic mails. Three remainders were sent a week apart to all FLHCW fitting the inclusion criteria. All data entered in Windows Microsoft office excel sheet, analyzed using SPSS v 22(IBM Corp, USA). Descriptive statistics applied where ever needed and to check for association between factors Chi-square was applied with level of significance defined as p value less than 0.05. Multinomial logistic regression was done to identify the factors. Ethical clearance was obtained from the Institutional Ethical Committee (IEC) before the start of study. Online Written Informed consent was taken from the study participants by informing them about the benefits and risks involved in the study.

650 Total Frontline Health care workers (FLHCWs) working in the Covid Hospital.
⇩
108 FLHCWs had already contracted the COVID who were excluded from the study.
⇩
60 Consultants were above 50 years did not take part in study as they were not part of COVID duties
⇩
120 FLHCW resigned the job due to various reasons
⇩
362 participated in the study who fitted the inclusion and exclusion criteria

3. Results

Out of 362 FLHCW, 142(39.2%) belonged to age group of 21-25 years, 122(33.7%) belonged to age group of 26-30, 243(67.1%) were female FHCW, 86(23.8%) were junior residents and 81(22.4%) were interns, 209(57.7%) were unmarried, 105(29%) were working in COVID ward and 87(24%) were working in the Fever Clinic, 187(51.7%) were working more than 8 hours,189(52.2%) Perceived their workload during COVID duties as medium, 265(73.2%) followed Regular working Shifts followed during COVID duties and 234(64.6%) had Two Hours of rest during the on call shifts. (Table 1)

Out of 362, 338 (93.3%) had N-95 masks, 223 (61.9%) had used Protective gloves and 196(54.1%) had used Facial shields (Table 2)

Out of 362 FLHCW, 265(73.2%) had Moderate stress levels and 45 (12.4%) had High stress based on Cohen's Perceived Stress scale. With respect to Work and Social Adjustment, 55(15.2%) had Functional Impairment and Severe Psychopathology was seen in 178(49.2%). Out of 362 FLHCW 196(54.1%) had Corona anxiety (Table 3)

130(83.3%) of those with moderate stress were Nursing staff, 74 (76.3%) who did not have regular shifts during COVID duties had Moderate stress and this association was found to be statistically significant. 115(47.3%) who were female FLHCW were found to have severe Psychopathology, 91(58.3%) of those who had severe psychopathology were Nursing staff and 86(58.9%) who had severe psychopathology were Married and this association was found to be statistically significant. 101(64.7%) who had corona anxiety were Nursing staff, 104(59.4%) who had working hours less than 8 hours per day had Corona Anxiety, 47(67.1%) who perceived workload as low during COVID duties had Corona anxiety, 152(57.4%) who had regular working shifts had Corona anxiety and 139(59.4%) who had 2 hours of rest during on call shifts had Corona anxiety and this association was statistically significant.(Table 4)

The Corona anxiety among junior residents decreased significantly compared to other occupational categories with odds ratio of 0.487(0.253-0.940, p =0.032). Various other factors like Working hours per day less than 8 hours, Perceived work load during COVID duties as low, regular working Shifts followed during COVID duties and Two Hours of rest during the on call shifts doesn't show any statistically significant association with Corona anxiety however they had higher odds. (Table 5)

Functional impairment assessed by Work and Social Adjustment scale among Male FLHCWs decreased significantly compared to female FLHCWs with odds of 0.335(0.145-0.777, p value=0.01), Interns had Functional impairment with higher odds of 3.79 (1.3-10.5, p value =0.01). With respect to severe Psychopathology, factors were not found to be statistically significant however Male and Interns had higher odds. (Table 6)

The Moderate Perceived stress were seen among junior residents with significantly high odds ratio (6.35 1.975-20.434) compared to other occupational categories and also Junior Residents with higher odds ratio of 3.9 (1.04-15.2).(Table 7)

4. Discussion

The present study is a hospital based study carried out for a period of 5 months in a designated covid hospital. Out of 362 FLHCWs, 142(39.2%) belonged to age group of 21-25 years, 243(67.1%) were females, 86(23.8%) were Junior Residents, 209(57.7%) were unmarried, 105(29%) were working in COVID ward, 187(51.7%) were working more than 8 hours, 189(52.2%) perceived their work load

during COVID duties as medium, 265(73.2%) followed regular working shifts followed during COVID duties and 234(64.6%) had two hours of rest during the on call shifts. Out of 362 FLHCWs, 45 (12.4%) had High stress based on Cohen's perceived stress scale. With respect to work and social adjustment, severe psychopathology was seen in 178(49.2%) and 196(54.1%) had Corona anxiety.

Occupation and Shifts followed during Covid duties were found to have statistically significant association with stress. Gender and occupation were found to have statistically significant association with work and social adjustment. Working hours per day, occupation, perceived workload during duties, regular shifts during Covid duties and hours of rest during Covid duties were few factors which were found to have statistically significant association with Corona anxiety. Maintaining healthcare workers over all health is of utmost importance during pandemic and mental health seems to be unaddressed. The present study showed anxiety among FLHCWs as 54.1%. Study done in India among Armed Force doctors using Hospital anxiety and depression score (HADS) showed prevalence of 35.2%.[10] Study done by Hasan et al. in Pakistan using GAD-7 among doctors showed similar prevalence of 45.7%.[11] Study done by Zhu et al. in China using self-rating anxiety scale (SAS) showed lesser prevalence of 11.4% among doctors and 27.9% among nurses however the sample size covered was less in this study.[12] 41.9% of health workers had symptoms of anxiety in a study done by Khanal et al. in Nepal using hospital anxiety and depression scale (HADS).[13] Study done by Luceño-Moreno et al. showed anxiety disorder is 58.6%, with 20.7% having a severe disorder anxiety among health personnel during the COVID-19 pandemic in Spain.[14] The present study showed 265(73.2%) had moderate stress levels and 45 (12.4%) had high stress based on Cohen's perceived stress scale. Study done by Nair et al. among doctors in India which was an online survey using perceived stress scale (PSS) showed 71% had moderate stress and 8% reported severe perceived stress.[15] Study done by Wang et al. in China who looked for work place stress of health care professionals caring Covid patients in a single hospital showed a lower stress scores among doctors possibly because the institutions were at very higher alert during the mid of the pandemic in China.[16]

Frontline health care workers are in close interaction with COVID-19 victims and direct observation of their physical as well as emotional suffering have been well-known depressing factors and they are likely to encounter voyeuristic distress. Junior doctors and young nursing staff are being the major health care force fighting the current pandemic as aged doctors have been withdrawn from the Covid duties as they are at more risk for morbidity and mortality attributed to COVID infections. Junior health care workers who have joined the frontline health care workers have been impacted more with COVID 19 as

Table 1: Distribution of FLHCW based on socio-demographic profile

		Frequency	**Percent**
	21-25	142	39.2
	26-30	122	33.7
Age in years	31-35	64	17.7
	36-40	15	4.1
	41 and above	19	5.3
Gender	Male	119	32.9
	Female	243	67.1
	Intern	81	22.4
Occupation	Junior Resident	86	23.8
	Consultant	39	10.8
	Nursing	156	43.1
	Married	146	40.3
Marital status	Unmarried	209	57.7
	Separated/Widow	7	1.9
	Fever Clinic	87	24.0
	Emergency	23	6.4
Currently working in	COVID ICU	72	19.9
	COVID Ward	105	29.0
	Non COVID ward	29	8.0
	COVID disinfection team	46	12.7
Working hours per day	Less than 8	175	48.3
	More than 8	187	51.7
	Low	70	19.3
Perceived workload during COVID duties	Medium	189	52.2
	High	103	28.5
Regular working Shifts followed during COVID duties	Yes	265	73.2
	No	97	26.8
Two Hours of rest during the on call shifts	Yes	234	64.6
	No	128	35.4

Table 2: Usage of personal protective instruments

PPE	Frequency (Percentage)
N-95 masks	338(93.3%)
Facial shield	196(54.1%)
Protective Boots	120(33.1%)
Protective Gloves	223(61.9%)
Protective Aprons	156(43.9%)

Table 3: Distribution of FHCW according to mental health status

	Categories	**Frequency**	**Percent**
	Low stress	52	14.4
Perceived Stress	Moderate stress	265	73.2
	High Stress	45	12.4
	Normal	129	35.6
WSAS	Functional Impairment	55	15.2
	Severe Psychopathology	178	49.2
Corona anxiety	Absent	166	45.9
	Present	196	54.1

Table 4: Association between socio-demographic profile and mental health of frontline health workers

Variable	Category	Perceived stress			WSAS			Corona Anxiety	
		Low stress	Moderate stress	High Stress	Normal	Functional Impairment	Severe Psychopathology	No Corona anxiety	Corona anxiety
Age in years	21-25	29(20.4%)	94(66.2%)	19(13.4%)	52(36.6%)	25(17.6%)	65(45.8%)	75(52.4%)	68(47.6%)
	26-30	14(11.5%)	95(77.9%)	13(10.7%)	41(33.6%)	17(13.9%)	64(52.5%)	52(42.6%)	70(57.4%)
	31-35	6(9.4%)	50(78.1%)	8(12.5%)	28(43.8%)	7(10.9%)	29(45.3%)	24(38.1%)	39(61.9%)
	36 and above	8(23.5%)	6(17.6%)	20(58.7%)	3(8.8%)	26(76.5%)	5(14.7%)	15(44.1%)	19(55.9%)
	p value			0.49		0.6		0.25	
Gender	Male	17(14.3%)	83(69.7%)	19(16.0%)	47(39.5%)	9(7.6%)	63(52.9%)	48(40.3%)	71(59.7%)
	Female	35(14.4%)	182(74.9%)	26(10.7%)	82(33.7%)	46(18.9%)	115(47.3%)	118(48.6%)	125(51.4%)
	p value			0.355		0.018		0.12	
Occupation	Intern	25(30.9%)	45(55.6%)	11(13.6%)	25(30.9%)	19(23.5%)	37(45.7%)	41(50.6%)	40(49.4%)
	Junior Residents	11(12.8%)	68(79.1%)	7(8.1%)	37(43.0%)	15(17.4%)	34(39.5%)	51(59.3%)	35(40.7%)
	Consultant	10(25.6%)	22(56.4%)	7(17.9%)	21(53.8%)	2(5.1%)	16(41.0%)	19(48.7%)	20(51.3%)
	Nursing	6(3.8%)	130(83.3%)	20(12.8%)	46(29.5%)	19(12.2%)	91(58.3%)	55(35.3%)	101(64.7%)
	P value			0.0001		0.003		0.003	
Marital status	Married	9(6.2%)	118(80.8%)	19(13.0%)	42(28.8%)	18(12.3%)	86(58.9%)	49(33.6%)	97(66.4%)
	Unmarried	42(20.1%)	141(67.5%)	26(12.4%)	85(40.7%)	35(16.7%)	89(42.6%)	110(52.6%)	99(47.4%)
	Separated/Widow	1(14.3%)	5(71.4%)	1(14.3%)	2(28.6%)	2(28.6%)	3(42.9%)	6(75%)	1(25%)
	p value			0.005		0.03		0.001	
Currently working in	Fever Clinic	20(23.0%)	56(64.4%)	11(12.6%)	39(44.8%)	12(13.8%)	36(41.4%)	51(58.6%)	36(41.4%)
	Emergency	4(17.4%)	15(65.2%)	4(17.4%)	6(26.1%)	2(8.7%)	15(65.2%)	12(52.2%)	11(47.8%)
	COVID ICU	10(13.9%)	55(76.4%)	7(9.7%)	24(33.3%)	11(15.3%)	37(51.4%)	27(37.5%)	45(62.5%)
	COVID Ward	12(11.4%)	78(74.3%)	15(14.3%)	41(39.0%)	15(14.3%)	49(46.7%)	46(43.8%)	59(56.2%)
	COVID OPD	3(10.3%)	23(79.3%)	3(10.3%)	7(24.1%)	6(20.7%)	16(55.2%)	12(41.4%)	17(58.6%)
	Disinfection team	3(6.5%)	38(82.6%)	5(10.9%)	12(26.1%)	9(19.6%)	25(54.3%)	18(39.1%)	28(60.9%)
	p value			0.3		0.4		0.09	
Working hours per day	Less than 8	3(13.1%)	29(73.7%)	23(13.1%)	62(35.4%)	26(14.9%)	87(49.7%)	71(40.6%)	104(59.4%)
	More than 8	29(15.5%)	13(72.7%)	2(11.8%)	67(35.8%)	29(15.5%)	91(48.7%)	95(50.8%)	92(49.2%)
	p value			0.78		0.9		0.03	
Perceived workload during COVID duties	Low	9(12.9%)	55(78.6%)	6(8.6%)	20(28.6%)	7(10.0%)	43(61.4%)	23(32.9%)	47(67.1%)
	Medium	30(15.9%)	131(69.3%)	28(14.8%)	66(34.9%)	30(15.9%)	93(49.2%)	93(49.2%)	96(50.8%)
	High	13(12.6%)	79(76.7%)	11(10.7%)	43(41.7%)	18(17.5%)	42(40.8%)	50(48.5%)	53(51.5%)
	p value			0.49		0.11		0.04	
Shifts followed during COVID duties (Regular working)	Yes	34(12.8%)	191(72.1%)	40(15.1%)	99(37.4%)	36(13.6%)	130(49.1%)	113(42.6%)	152(57.4%)
	No	18(18.6%)	74(76.3%)	5(5.2%)	30(30.9%)	19(19.6%)	48(49.5%)	53(54.6%)	44(45.4%)
	p value			0.024		0.28		0.02	
Hour of rest during the on call shifts	Yes	27(11.5%)	177(75.6%)	30(12.8%)	77(32.9%)	38(16.2%)	119(50.9%)	71(55.5%)	57(44.5%)
	No	25(19.5%)	88(68.8%)	15(11.7%)	52(40.6%)	17(13.3%)	59(46.1%)	95(40.6%)	139(59.4%)
	p value			0.117		0.32		0.005	

Table 5: Binary logistic regression for association between Corona anxiety and related factors

Corona anxiety and related factors	B	S.E.	p value	Adjusted odds ratio	95% C.I. Lower	95% C.I. Upper
Interns	-.208	.356	0.559	0.812	0.404	1.632
Junior residents	-.719	.335	0.032	0.487	0.253	0.940
Consultants	-.485	.426	0.255	0.616	0.267	1.419
Working hours per day less than 8 hours	.184	.245	0.453	1.202	0.743	1.945
Perceived work load during COVID duties as low	.658	.366	0.072	1.931	0.943	3.957
Perceived workload during COVID duties as medium	.032	.263	0.903	1.033	0.617	1.729
Regular working Shifts followed during COVID duties	.192	.269	0.474	1.212	0.716	2.052
Two Hours of rest during the on call shifts	.323	.262	0.217	1.381	0.827	2.307

Table 6: Multinomial logistic regression between work and social adjustment and related factors

WSAS		B	p value	Adjusted odds ratio	95% Confidence Interval for Exp (B) Lower Bound	95% Confidence Interval for Exp (B) Upper Bound
Functional Impairment	Male	-1.093	0.011	.335	0.145	0.777
	Intern	1.333	0.011	3.792	1.361	10.563
	Junior residents	.707	0.140	2.028	0.792	5.189
	Consultants	-1.208	0.132	0.299	0.062	1.438
Severe Psychopathology	Male	.220	0.407	1.245	0.741	2.093
	Intern	.192	0.612	1.211	0.577	2.542
	Junior residents	-.460	0.190	0.631	0.317	1.256
	Consultants	-1.051	0.008	0.349	0.161	0.760

*Reference Category: Normal WSAS

Table 7: Multinomial logistic regression between perceived stress scores and related factors

Perceived stress score		B	p value	Adjusted odds ratio	95% Confidence Interval for Exp (B) Lower Bound	95% Confidence Interval for Exp (B) Upper Bound
Moderate stress	Interns	1.849	0.002	6.352	1.975	20.434
	Junior Residents	1.382	0.044	3.981	1.040	15.237
	Consultants	1.314	0.057	3.723	0.961	14.423
	Regular working Shifts followed during COVID duties	-1.142	0.046	.319	0.104	0.980
Severe stress	Interns	-.663	0.116	.515	0.225	1.179
	Junior Residents	.092	0.847	1.096	0.431	2.790
	Consultants	-1.005	0.050	.366	0.134	0.998
	Regular working Shifts followed during COVID duties	-1.249	.014	.287	0.105	0.781

*Reference Category: Low stress

compared with experienced senior medical professionals as the junior staff is less prepared for such distressful situation at the beginning of their professional career. Junior doctors had higher stress probably because of less experience, financial instability, unable to handle stress at early phase of careers.[17] Training all FLHCWs handling emerging diseases with proper protocols of donning and doffing has been carried out however adequate, sustained and uninterrupted supply of Personal protective equipment's has been questionable especially in the initial stages of pandemic. Assessment of mental health status of FLHCW needs to be done with thorough screening policy. For those who are at risk of mental health abnormalities, need to be picked early and addressed with proper psychological counselling. Institutions have to develop policies for Periodic assessment of mental health status. Overworked and under resourced FLHCWs facing the real possibility of infection and reliant on potentially misleading information about this uncertain epidemic.[18] Stress and anxiety among health care workers needs to be addressed using mindfulness based intervention and coping skills with anxiety and stress which can reduce stress. Proper addressing of these factors may reduce critical FLHCWs shortage when need is demanding during pandemics. Studies have shown that diaphragmatic breathing may decrease physiological stress and psychological stress which is the most cost effective method in stress reduction.[19,20] The institutions fighting the pandemic should screen for occupational stress regularly in their FLHCWs to bring out the positives and minimize the suffering caused by distress. In the present study With respect to work and social adjustment among FLHCWs, 55(15.2%) had functional impairment and severe psychopathology was seen in 178(49.2%). The death rates are low in COVID 19 infection compared with other emerging diseases however deaths among frontline healthcare workers have increased. Social support is a robust primary prevention intervention for occupational stress. One of the few anti-dotes for stress and anxiety relayed to occupation is Physical fitness programs which needs to be made widely available for all employees as a way to prevent stress. By periodic evaluation those who have higher scores in spite of these interventions can undergo symptom directed treatment therapies and counselling interventions to restore health and function. Positive psychology interventions (PPIs) stem from research that focuses on teaching individuals how to increase positive thinking and behaviours through brief, self-administered exercises , life coaching and mindfulness training, as well as education and development programs that build character strengths needs to be practiced compulsorily after proper training to doctors and nurses.[21,22]

Strengths of the study were many. Validated questionnaire were used to assess anxiety, stress and work related social adjustment. As the study was done through online portal, sufficient time was given to participants to respond in their busy schedule so that all FLHCWs could be included. Study had few limitations. The study was conducted in a single Covid care center where the pandemic were still in the initial stages. Study was conducted in a single Covid care center making study of poor generalizability.

5. Source of Funding

6. Conflict of Interest

Nil.

7. Acknowledgement

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