



Development of a Valid and Reliable Questionnaire to Assess Occupational Stressors and Coping Strategies among Health Management and Support Workers During a Pandemic

Parnami S¹, Yadav S², Ajmera P³, Rai B⁴

¹Department of Hospital Administration, Amity Medical School, Amity University, Gurugram, Manesar-122413, Haryana, India;

²School of Allied Health Sciences and Management, Delhi Pharmaceutical Sciences and Research University, New Delhi -110017;

³School of Allied Health Sciences and Management, Delhi Pharmaceutical Sciences and Research University, New Delhi -110017;

⁴Department of Microbiology, ABVIMS & Dr Ram Mahonar Lohia Hospital, Baba Kharak Singh Marg, New Delhi – 110001, India;

Correspondence should be addressed to:

Suhas Parnami or Sheetal Yadav

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ABSTRACT:

The coronavirus disease started as a series of critical cases of pneumonia, first identified in Wuhan city of China, in December 2019. On March 11, 2020, the World Health Organisation declared Covid-19 as a global pandemic with potentially serious effect on health, particularly mental health. Health workers directly and indirectly involved in patient care during this time reported high rates of stress, depression, insomnia, and anxiety due to the uncertainty surrounding the pandemic's future, vaccine accessibility, increased work pressure, lack of social support, and the spread of fear to family members. The aim of this study was to develop a valid and reliable questionnaire assessing occupational stressors and coping strategies among health management and support workers during this outbreak. The data for the study was based on a set of questionnaires pertaining to various aspects involving occupational stressors and coping mechanisms. The questionnaire was thoroughly reviewed and validated by a total of five well known experts from the field of medicine as well as academics. A pilot study was conducted at selected private hospitals of Delhi NCR, India, also designated as Covid-19 facilities and their responses were calculated. After ensuring validity, the questionnaire was evaluated to examine its reliability Cronbach's alpha by using the SPSS software version 27. The final questionnaire, comprising a total of 65 validated structured questions, was ultimately developed, which contained appropriate content and very good reliability. Hence, this questionnaire could be used as a beneficial questionnaire to assess occupational stressors and coping strategies among health management and support workers during a pandemic.

Introduction

The global pandemic caused by SARS-CoV-2 in China in late 2019 wreaked havoc on the economic, healthcare and social systems around the world. Steadily increasing cases, lack of personal protective equipment, excessive work hours coupled with strain, and a lack of availability of a definitive treatment or effective medications to save lives added to mental health burden

explicitly tied to working amidst the Covid-19 outbreak^[1]. It has been observed that the mental health impact of a disease outbreak is usually neglected during pandemic management, the consequences of which can prove to be a very costly affair^[2]. Healthcare workers (HCWs) are most at risk since they are in close touch with patients either when caring for them or when they are exposed to a patient's infectious sample or environment, resulting in an increase in the sense of



fearfulness amongst them, especially in terms of becoming a carrier of the infection and infecting their family members or facing dire consequences by contracting the infection themselves. Hence, stress and job burnout among HCWs are always high during such situations^[3]. In a study conducted by Rose et al., they discovered that the thought of transmitting the disease to friends and family was extremely worrisome for HCWs in the first wave of the Covid-19 outbreak. Furthermore, uncertainty about when the pandemic would end, along with witnessing patients dying from the pandemic, were cited as major sources of stress for all groups^[4].

Coping strategies and stress have been a controversial subject in previous researches as well since, under stressful conditions, although many people may be affected, individual responses vary depending on personal coping techniques. Coping methods basically relate to cognitive and behavioral attempts that help in reducing situational strain and are employed when the demands of a stressful circumstance exceed the individual's tolerance capacity. The most prevalent coping mechanisms employed by healthcare personnel include accepting the crucial circumstance and maintaining an optimistic attitude while on the job^[5].

There are various studies conducted on stressors and coping mechanisms; however, the majority of the studies available have been conducted on physicians and nurses. There are only a few studies which include health management and support workers who are not directly engaged in patient care but are definitely affected by the pandemic; hence, our study helps one get a larger perspective on the various occupational stressors and coping mechanisms adapted by the population that does not directly deal with the treatment of the patient but is at higher risk of exposure to an infected patient than the general public.

Materials and Methods

A pilot study was conducted at selected private hospitals of Delhi NCR, also designated as Covid-19 facilities and their responses were calculated. The final questionnaire, comprising 65 validated structured questions, was ultimately developed, and the response to each item was based on different scales.

Development of a Questionnaire

The questionnaire was developed in the following five stages.

Stage I: Preparing scope and organisation of questionnaire items

The data for the study was collected by conducting preliminary and detailed interviews with health management and support workers, including staff belonging to medical administration, general administration, marketing, human resources, and outsourced staff (housekeeping, general duty assistants, kitchen staff, drivers, security, and maintenance staff) from selected private hospitals also designated as Covid 19 facilities in Delhi NCR. Healthcare providers (doctors, nurses, technicians, physiotherapists, dentists, Outpatient Department pharmacists, dieticians) were excluded from the study. A thorough and rigorous review of the literature in order to gain a better understanding of the facts and knowledge about various attributes of the questionnaire was also undertaken.

Stage II: Developing questionnaire items

On the basis of the information collected, content and items bearing the assessment of occupational stressors and coping strategies among health management and support workers during the Covid 19 Outbreak in India were identified on the Likert scale. Initially, a pool of 67 items and questions was created under various sections, such as vital information, occupational stress factors, mental health, and coping strategies. This pool was then thoroughly reviewed by a total of 5 well known experts from the field of medicine as well as academics for validity. The experts were requested to evaluate each statement under section A (Vital Information), section B (Occupational Stress Factors) and section D (Coping Strategies) by scoring them in between 1 to 5 based on the applicability of each item the attributes aimed to measure with 1 representing "By no means Acceptable" to five equating to "Completely Acceptable". Since section C (Mental Health Assessment) is based on a pre-validated scale (Hospital Anxiety & Depression Scale) (HADS), it did not require any validation. The statements that were scored less than three by the experts were then removed from the questionnaire, leading to a total of 65 questions.



Stage III: Developing preliminary questionnaire

A self-executed questionnaire consisting of 65 items was constructed. Section A of the questionnaire consisted of sociodemographic and other vital information, including name, family situation, position held at the hospital, total years of work experience, average number of working hours, and other questions related to the area of work at the hospital, exposure, severity of disease, changes in work timings, and protocol during the pandemic. Section B dealt with questions related to occupational stress factors related to Covid 19 work culture, whereas section C comprised a pre-validated assessment of mental health based on the HAD scale. The last part of the questionnaire – section D consisted of questions pertaining to the coping strategies that were adopted to deal with the stress due to the global pandemic.

Stage IV: Conducting pilot study in target population

A pilot study was conducted using the questionnaire, in which the target group consisting of health management and support workers, including staff belonging to medical administration, general administration, marketing, human resources, and outsourced staff (housekeeping, general duty assistants, kitchen staff, drivers, security, and maintenance staff), were questioned using the structured questionnaire to

ascertain its aptness and relevance. Their responses were then analysed qualitatively by examining the comments of the respondents regarding the compatibility, appropriateness, and interpretability of questions, and the deficiency of any significant questions.

Stage V: Reliability of questionnaire

After ensuring validity, the questionnaire was evaluated to examine its reliability, which is described as ‘the ability of a questionnaire to measure the consistency of an attribute and how well the items correlate with each other and conceptually fit together’. Internal consistency refers to the ‘homogeneity of all the items of the questionnaire’. It was measured in terms of Cronbach’s alpha by using SPSS software version 27, and a Cronbach’s alpha value ranging from 0.7 or higher is considered acceptable.

Table-1: (a) Reliability Statistics and (b) Item-Total Statistics

Reliability Statistics (a)		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.731	.619	37

Item-Total Statistics (b)

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Feeling frightened	113.02	143.554	.201	.646	.622
Worrying about getting infected	113.35	143.696	.145	.660	.627
Long working hours	113.13	135.935	.440	.659	.601
Conflict in duty and safety	112.44	145.139	.104	.614	.631
worrying about inflicting Covid on family	114.27	143.196	.188	.513	.623
Feeling exhausted without enough breaks	112.95	142.963	.236	.570	.620
Feeling Unhappy about working overtime	112.20	138.711	.353	.708	.742



Too much work allotted	112.73	139.169	.319	.763	.769
No work-life balance	112.43	134.767	.438	.746	.599
Compromising personal safety	112.20	144.602	.144	.630	.627
Shortage of necessary resources	112.12	146.505	.097	.654	.630
Discomfort wearing protective gears all time	113.41	139.190	.336	.579	.611
Expecting recognition from authorities	114.00	144.260	.129	.555	.628
Using Social Media	112.67	146.167	.123	.609	.628
Watching TV or any streaming platform	112.52	142.279	.293	.591	.616
Use of Substance	114.86	152.365	-.115	.740	.642
Smoking	114.99	150.637	-.030	.734	.635
Consuming Alcohol	114.90	149.977	-.001	.692	.634
Listening to Music	112.96	142.341	.206	.620	.621
Cooking	113.12	140.445	.265	.619	.616
Online Shopping	113.46	142.592	.211	.583	.621
Chatting	112.50	142.512	.199	.576	.622
Social gatherings	114.11	147.892	.013	.639	.640
Meditation / Yoga	112.99	139.315	.301	.614	.613
Prayers	111.80	143.927	.213	.299	.622
Reading	112.86	147.899	.046	.355	.634
Playing games	113.25	142.149	.207	.609	.621
Playing with pets	113.90	139.114	.294	.609	.613
Exercise	113.46	141.963	.198	.452	.622
Positive attitude	112.14	143.000	.170	.563	.625
Help from Psychologist	114.26	153.124	-.131	.561	.650
Venting emotions	113.80	150.831	-.060	.514	.644
Support from management	112.07	147.036	.065	.546	.633
Proper communication	111.98	150.075	-.036	.671	.641
Requesting for transfer to non-Covid areas	112.33	139.703	.252	.574	.617
Considering changing or leaving profession	111.90	148.339	.030	.709	.635
Proper redressal and feedback by management	111.97	143.177	.222	.572	.621



Reliability Statistics

Cronbach's Alpha	Part 1	Value	.669
		N of Items	19 ^a
	Part 2	Value	.534
		N of Items	18 ^b
Total N of Items			37
Correlation Between Forms			.102
Spearman-Brown Coefficient	Equal Length		.185
	Unequal Length		.185
Guttman Split-Half Coefficient			.184

a. The items are: Feeling frightened, Worrying about getting infected, Long working hours, Conflict in duty and safety, worrying about inflicting Covid on family, Feeling exhausted without enough breaks, Feeling Unhappy about working overtime, Too much work allotted, No work-life balance, Compromising personal safety, Shortage of necessary resources, Discomfort wearing protective gear all time, Expecting recognition from authorities, Using Social Media, Watching TV or any streaming platform, Use of Substance, Smoking, Consuming Alcohol, Listening Music.

b. The items are: Cooking, Online Shopping, Chatting , Social gatherings, Meditation / Yoga, Prayers, Reading, Playing games, Playing with pets, Exercise, Positive attitude, Help from Psychologist, Venting emotions, Support from management, Proper communication, Requesting for transfer to non-Covid areas, Considering changing or leaving profession, Proper redressal, and feedback by management.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.743
Bartlett's Test of Sphericity	Approx. Chi-Square	2714.973
	df	666
	Sig.	<.001

Communalities

	Initial	Extraction
Feeling frightened	1.000	.419
Worrying about getting infected	1.000	.111
Long working hours	1.000	.564
Conflict in duty and safety	1.000	.487
worrying about inflicting Covid on family	1.000	.124



Feeling exhausted without enough breaks	1.000	.359
Feeling Unhappy about working overtime	1.000	.630
Too much work allotted	1.000	.601
No work-life balance	1.000	.579
Compromising personal safety	1.000	.417
Shortage of necessary resources	1.000	.484
Discomfort wearing protective gears all time	1.000	.345
Expecting recognition from authorities	1.000	.262
Using Social Media	1.000	.466
Watching TV or any streaming platform	1.000	.411
Use of Substance	1.000	.541
Smoking	1.000	.335
Consuming Alcohol	1.000	.523
Listening to Music	1.000	.418
Cooking	1.000	.509
Online Shopping	1.000	.474
Chatting	1.000	.496
Social gatherings	1.000	.429
Meditation / Yoga	1.000	.359
Prayers	1.000	.133
Reading	1.000	.194
Playing games	1.000	.438
Playing with pets	1.000	.508
Exercise	1.000	.240
Positive attitude	1.000	.309
Help from Psychologist	1.000	.212
Venting emotions	1.000	.240
Support from management	1.000	.256
Proper communication	1.000	.478
Requesting for transfer to non-Covid areas	1.000	.402
Considering changing or leaving profession	1.000	.628



Proper redressal and feedback by management	1.000	.248
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Extraction Method: Principal Component Analysis.

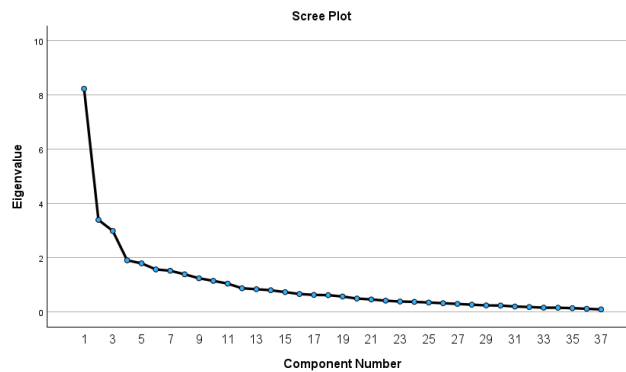
Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.235	22.256	22.256	8.235	22.256	22.256	5.466	14.774	14.774
2	3.400	9.190	31.445	3.400	9.190	31.445	5.087	13.747	28.521
3	2.992	8.085	39.531	2.992	8.085	39.531	4.073	11.009	39.531
4	1.908	5.157	44.687						
5	1.798	4.859	49.546						
6	1.572	4.250	53.796						
7	1.524	4.119	57.915						
8	1.393	3.764	61.679						
9	1.247	3.370	65.049						
10	1.152	3.113	68.163						
11	1.049	2.835	70.998						
12	.878	2.372	73.370						
13	.843	2.279	75.649						
14	.805	2.176	77.825						
15	.736	1.989	79.814						
16	.666	1.801	81.616						
17	.634	1.714	83.330						
18	.624	1.687	85.017						
19	.573	1.550	86.567						
20	.499	1.348	87.915						
21	.466	1.258	89.173						
22	.421	1.138	90.312						
23	.389	1.051	91.363						
24	.376	1.016	92.379						
25	.352	.953	93.331						



26	.327	.884	94.216						
27	.301	.814	95.029						
28	.273	.737	95.766						
29	.246	.664	96.431						
30	.241	.652	97.083						
31	.205	.553	97.636						
32	.187	.504	98.141						
33	.163	.441	98.581						
34	.160	.433	99.015						
35	.145	.392	99.407						
36	.121	.328	99.735						
37	.098	.265	100.000						

Extraction Method: Principal Component Analysis.



Rotated Component Matrix^a

	Component		
	1	2	3
Feeling frightened	.597	-.142	-.207
Worrying about getting infected	.285		-.171
Long working hours	.737	.132	
Conflict in duty and safety	.566	-.310	-.266
Worrying about inflicting Covid on family	.293	.157	.116
Feeling exhausted without enough breaks	.525	-.288	
Feeling Unhappy about working overtime	.747	-.256	



Too much work allotted	.767		
No work-life balance	.758		
Compromising personal safety	.520	-.255	-.287
Shortage of necessary resources	.527	-.357	-.279
Discomfort wearing protective gears all time	.564	.156	
Expecting recognition from authorities	.427	.281	
Using Social Media	-.246	.187	.609
Watching TV or any streaming platform			.641
Use of Substance	-.411	.603	
Smoking	-.180	.550	
Consuming Alcohol	-.139	.710	
Listening to Music	-.121		.635
Cooking	-.138		.696
Online Shopping		.475	.496
Chatting	-.145	-.246	.644
Social gatherings	-.229	.280	.546
Meditation / Yoga		.407	.431
Prayers	.228	-.132	.252
Reading	-.164	.286	.292
Playing games		.160	.635
Playing with pets		.468	.535
Exercise	.125	.330	.339
Positive attitude		-.354	.426
Help from Psychologist	-.303		.338
Venting emotions	-.157		.464
Support from management	.191		-.464
Proper communication			-.686
Requesting for transfer to non-Covid areas	-.211	.593	
Considering changing or leaving profession	.304	-.729	
Proper redressal and feedback by management	.306		-.383



Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

The materials and methods section should contain sufficient detail so that all procedures can be repeated. It may be divided into headed subsections if several methods are described.

Results and Discussion

Validity

The experts rated 39 items on the questionnaire as either 4 or 5 on the Likert scale of 1–5. 90 percent of the experts were able to understand all the questions clearly and also found them convenient to respond, mentioning that its outline would be relevant in respect to the intended target population. Since the validity and relevance of content with the conceptualised framework is specified by a score of 4 or 3 on the Coefficient of Variation index (CVI), for instance, if three out of the five experts rated a question as relevant, the CVI will be $\text{three/five} = 0.6$, but the CVI required for an item to be considered as relevant is 0.8, otherwise the item would be omitted. Hence, two items from the questionnaire turned out to be invalid because they resulted in CVI of 0.6 and 0.4, and were therefore dropped from the questionnaire. The CVI of the remaining items fell between the valid range from 0.8 to 1.00, and were therefore kept in the questionnaire. The final questionnaire consisted of 65 questions, which included the 37 validated items by the experts in addition to 14 pre-validated items based on the HAD scale and 14 items pertaining to sociodemographic details.

Internal Reliability

After validity was assessed, the reliability coefficient was calculated for the questionnaire consisting of 37 items using Cronbach's alpha with SPSS version 27, and the value was found to be 0.731 (Table 1), which reflects a good correlation between various items of the questionnaire.

During the study, detailed and cautious attention was given towards development of the questionnaire assessing Occupational Stressors and Coping Strategies among Health Management and Support Workers During the Covid 19 Outbreak in India. Since the study primarily focused on the validity and reliability of this questionnaire therefore, each draft of this questionnaire

was thoroughly and carefully examined by experts with respect to precision, correctness, and representativeness of the questions, and based on their inputs, two of the questions were omitted. Appropriate and sufficient stress was given to ensure the face validity of this questionnaire, which was achieved by incorporating and analysing discussions on all questions with domain experts, so as to have thorough feedback on the design and impact of the questionnaire. The final questionnaire comprised four sections which will help in assessing the Occupational Stressors and Coping Strategies Among Health Management and Support Workers During pandemic. The internal consistency of this questionnaire was assessed using Cronbach's alpha. It was calculated as 0.731, indicating that a high correlation exists between various items of this questionnaire, and therefore, this questionnaire can be deliberated to be consistently reliable.

Conclusion

This valid and reliable questionnaire has been developed to assess Occupational Stressors and Coping Strategies Among Health Management and Support Workers During pandemic. The questionnaire contains appropriate content and face validities, has very good reliability, and hence can prove to be a beneficial tool in case of any future pandemic. To add more strength to the objectivity of the questionnaire for further research in the area, it is suggested to calculate the convergent and discriminant validity to evaluate the similarities and dissimilarities of this questionnaire with other accessible tools assessing similar details. In addition, confirmatory factor analysis could be done in order to add to the general ability of the questionnaire. However, we are confident that the questionnaire is a valid and reliable tool for assessing occupational stressors and coping strategies in the event of a pandemic outbreak.

Ethics approval and consent to participate

All individuals and participating organisations were asked for their permission. A standardised consent was



taken along with the questionnaire. Subjects had the right to withdraw from the study at any point of time as well as refuse to answer any question. Total confidentiality and anonymity was maintained.

List of abbreviations

CVI	Coefficient of variation index
HAD	Hospital anxiety & Depression scale
HCWs	Healthcare workers

Data Availability

Conflicts of Interest

None of the authors have any conflict of interest to disclose concerning this study.

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Authors' contributions

All authors made significant contribution to the conception, design, drafting and revision of this manuscript. SP conceptualized the study, was responsible for data collection and contributed to writing. SY supervised the overall process and final editing. SY conducted an extensive literature review and prepared the tables and figures. PA contributed by providing a critical review. BR assisted in formatting, proofreading and ensuring adherence to the journal guidelines. All authors reviewed and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

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Supplementary Materials

No supplementary material for this article is available

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