Original Research

Development and validation of a tool to assess the organizational consequences of occupational stress among secondary school teachers in Sri Lanka

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Abstract

Introduction: Literature revealed the lack of a comprehensive tool to assess organizational consequences of occupational stress (OCOS) among schoolteachers.

Objectives: To develop and validate an instrument to measure the OCOS among secondary school teachers in Sinhala medium government schools (OCOST-Sinhala)

Methods: Triangulation of quantitative and qualitative methods was used to design and validate OCOST-Sinhala. Item generation was guided by a conceptual framework. Reducing the items was through an assessment of a panel of experts and by Principal Component Analysis (PCA). PCA was performed among 360 secondary teachers to assess the factor structure. Construct validity was assessed by Confirmatory Factor Analysis (CFA) and a multi-trait scaling analysis in a survey among 300 secondary teachers. Cronbach' alpha and test re-test reliability were determined.

Results: OCOST-Sinhala had 45 items in seven domains (self-efficacy, work engagement, motivation, job satisfaction, enthusiasm, workload & work performance). In PCA, 65.98% of the variance was explained. All the indices used to evaluate the fitness of the model, confirmed that the statistical fitness of the original seven factors model provide valid results. CFA and multi-trait scaling analysis confirmed the construct validity with reliability confirmed as good (Cronbach's alpha 0.92; test re-test reliability >0.7).

Conclusions & Recommendations: The developed OCOST-Sinhala was found to be a valid and reliable test to assess OCOS among secondary school teachers in Sri Lanka.

Keywords: *OCOST, Sinhala, occupational stress, organizational consequences, teachers*

Introduction

Occupational stress (OS) defined as "the harmful physical and emotional responses that occur when the requirements of the job do not match the capabilities, resources or needs of the worker" (1-2) has emerged as a major public health problem. Stress is identified as the costliest of all work-related illnesses when considering the days lost per case (3). Human services such as education, health and law enforcement are considered as occupations related to high OS as they deal with pervasive social as well as individual problems (4-6). Prevalence of OS differs across countries and the occupational groups (3). The reported prevalence ranges from 27−87.4% among health care workers (7), 48.98% among police officers 46% (8) and 88.9% among teachers (9). In 2017, the prevalence of OS among secondary school teachers in public schools in the district of Colombo, Sri Lanka was found to be as high as 83.4% (10). OS is known to affect the health of the affected persons as well as result in adverse consequences to the organization. Persistent activation of physiological and psychological responses in the body due to OS have shown to be associated with physical illnesses, unhealthy lifestyles, non-communicable diseases (NCDs) and psychological illnesses (11). The NCDs account for the deaths of 41 million people each year, which is 74% of all deaths globally. Of all NCD deaths, 77% are in low- and middle-income countries. It is estimated that 83% of total deaths in Sri Lanka in 2016 were due to NCDs (12).

The multitude of adverse consequences for the organization highlighted in research are poor work performance (13-14), low job satisfaction (13, 15-17), low motivation (18), low self-efficacy (16), low work engagement (19), and increased absenteeism and increased labour turn-over (20). Often the researchers have focused on individual organizational consequences of OS using different tools. The tools that have been mostly used among teachers are Job Satisfaction Scale (21), Teaching Efficacy Scale (18), Teachers' Sense of Efficacy Scale (22-24), Teacher sense of Efficacy (25), Job Satisfaction subscale from the Work and Life Attitudes Survey (26) and Satisfaction with Life Scale (27). Absence of a single tool that assesses all aspects of OCOS was identified as one limitation for comprehensive evidence of OCOS. Thus, we undertook to develop and validate a culturally appropriate tool to measure OCOS among secondary teachers in Sinhala medium schools in Sri Lanka.

Methods

Development of the tool

Relevant literature was reviewed in order to develop a conceptual framework to depict different constructs of potential OCOS among secondary school teachers. The constructs identified were job satisfaction, motivation, work engagement, self-efficacy, work turn over intention and work performance, derived by a set of items. The items were further reviewed by a panel of educational specialist, psychiatrist, psychologist, an occupational health specialist, public health specialist and a schoolteacher, which resulted in generation of 68 items. Another panel of experts comprising an administrator of education sector, a secondary teacher, two public health specialists, an occupational health specialist, a psychologist and a psychiatrist not involved in item generation participated in a modified Delphi technique. During this process, the experts scored each item from 1-5, considering the relevance (1=least relevant; 5=highly relevant) and cultural appropriateness (1=least appropriate; 5=highly appropriate) of each item to assess the OCOS among secondary school teachers in Sri Lanka. A mean score of 3 or less for 'relevance' was taken as the cut-off to remove an item from the tool. An average score of 4 or above was taken as agreement of the experts on cultural appropriateness of an item; and if less than 4, it underwent modifications. After going through the required iterations, the items retained in the tool were designed into a self-administered questionnaire. It was then translated into Sinhala preserving the meaning as described by Sumathipala and Murray

(2000) (28) and pre-tested among 10 secondary teachers. The finalized tool was named OCOST-Sinhala.

Scale structure of the newly developed OCOST was identified using PCA. For this purpose, a cross-sectional study was conducted in Sinhala medium government schools in Gampaha District in a sample of 360 teachers. This sample size was based on the premise that the number of observations needed is estimated at 5-10 times the number of variables (29). PCA was done using the Varimax rotation technique. Components to be retained in the tool were selected depending on Eigen values exceeding 1.0.

Validation of the OCOST-Sinhala

Face validity of the OCOST-Sinhala was assessed through a panel of secondary teachers and education authorities and the content validity through educational specialists, psychiatrists, occupational health specialists and public health specialists.

The construct validity was ensured by confirming the scale structure using CFA and multi-trait scaling analysis. For this purpose, a cross-sectional study was conducted in a sample of 300 schoolteachers. CFA was carried out on the covariance matrix of the items of OCOST-Sinhala. Several model parameters were estimated using robust likelihood method in LISREL, to evaluate the fitness of the model due to non-normal distribution of data (absolute fit indices, comparative fit indices and parsimony correlation indices). Based on these parameters, one model was identified as the best fit model. This model was further refined according to LISREL suggestions and multi-trait scaling analysis carried out to further confirm the scale structure. Convergent properties of the tool were also checked by comparing the magnitude of the correlation of items with its own domain; and the discriminant properties, by scaling successes with its own subscale than with another subscale.

Reliability of the OCOST-Sinhala was assessed using test-retest method, by re-administering the tool after two weeks to a randomly selected sample of 25 secondary teachers. It was also assessed by appraising the internal consistency using Cronbach's alpha coefficient. Assessment of the acceptability of OCOST-Sinhala was assessed using the response rate, percentage of missing data and the rate of completion for domains and items.

For classifying the respondents as experiencing low or high OC, the research team decided on a minimum score for each item. This process indicated 146 as the cut-off score of the OCOS-Sinhala. This decision was also confirmed by the panel of experts who contributed to the assessment of judgmental validity.

Results

The mean age of teachers sampled for PCA was 45.3 (SD=7.7) and 45.4 (SD=8.2) sampled for CFA. A great majority in both PCA and CFA were females and Sinhalese (Table 1).

During the development stage of OCOS-Sinhala, after three iterations, 61 items were retained in the tool.

Factor structure of OCOST-Sinhala

The Kaiser-Meyer Olkin (KMO) statistic was 0.9, indicating the sampling adequacy for factorization. Bartlett's test of sphericity tests (χ^2=11509.6; $p<0.001$) showed that the population correlation matrix is significantly different from the identity matrix, indicating that it is suitable for structure detection. Anti-image correlation measured the sampling adequacy, which was above 0.5. The communalities showed values more than 0.5 for all items, indicating that the extracted components represent the variables well.

During PCA, there were 15 components with eigenvalues greater than one, explaining 65.98% of the variability of the OCOST. Following PCA, four items were removed since they did not load to any

component and another four since they loaded to two components. Therefore, at the end of PCA, the OCOST comprised of only 53 items (Table 2). The components and items identified by the PCA were further examined by the research team. Certain components were seen to measure conceptually similar constructs and therefore, were combined as a single component. Following this process, the OCOST comprised seven meaningful components, which were named appropriately (Table 3).

Table 1: Socio-demographic characteristics among participants

Characteristics	PCA (n=360)		CFA (n=300)	
	No.	%	No.	%
Age in completed years				
20-30	4	1.1	6	2.0
31-40	101	28.1	86	28.7
41-50	151	41.9	120	40.0
51-60	104	28.9	88	29.3
Sex				
Male	72	20.0	71	23.7
Female	288	80.0	229	76.3
Ethnicity				
Sinhala	359	99.7	298	99.3
Tamil	1	0.3	2	0.7
Religion				
Buddhist	345	95.8	296	98.6
Hindu	0	0	2	0.7
Roman Catholic	15	4.2	2	0.7
Current marital status				
Married	345	95.8	273	91.0
Unmarried	14	3.9	24	8.0
Widowed	1	0.3	3	1.0
Highest educational status				
Graduate	248	68.9	177	58.9
Trained Teacher	112	31.1	123	41.1
Main grades they teach in				
6-9	225	62.5	188	62.6
10-11	224	67.8	200	66.7
12-13	141	39.2	122	40.7
Period of service as a teacher in completed years				
1-10	86	23.9	75	25.0
11-20	138	38.3	97	32.3
21-30	106	29.5	98	32.7
31-40	30	8.3	30	10.0

Validity, reliability and acceptability of the OCOST-Sinhala

Compatibility of the data with the assumptions for CFA and fitness of the CFA model was checked. Visual inspection of the histograms showed non-normal distributions for some items. In this sample,

except for six items, all other items showed relatively high skewness and kurtosis.

All the items showed linear relationships on the bivariate scatter plots. Univariate box plots of data showed no outliers, while the highest correlation shown in the bivariate correlation between two items was 0.77, indicating that it was reasonable to assume that no two items were highly or perfectly correlated (30).

Summary of the model fit statistics is shown in Table 4. Of these, the seven-factor model was selected as the best fit model. This model was further refined taking into consideration the suggestions made by the LISREL software as well as the theoretical basis of OCOS. Eight items were identified as loading into multiple factors, since adding paths to more than one latent variable from these items improved the model fit. After removal of these items, the model fit further improved with more than 3 paths to the latent factors, resulting in best fitting model comprising of 45 items with 7 factors (Table 4).

Multi-trait scaling analysis was used to assess empirically the hypothesized scale structure (Table 5). Scaling successes were 86.7%. Except in the items in work performance, results of the multi-trait analysis of OCOST confirmed that the magnitude of the correlation of items of OCOST with its own domain was high where each item showed a statistically significant correlation of 0.4 or more with its own domain. This was taken as evidence of construct validity.

Test-retest reliability of the seven domains showed significant correlation coefficients ranging from 0.72-0.95, while the Cronbach's alpha was 0.92. The tool confirmed 100% acceptability.

Finally, the 5-point Likert scale used for the items was treated as a score, which ranged from 45 to 225. Items 3, 4, 5, 6, 7 were given reverse scores. Higher scores represented low OC. All the items were given equal weights.

Discussion

OCOST-Sinhala is the first-ever validated tool which measures all the components of the OCOS among secondary teachers. OCOS like poor work performance, low job satisfaction, low motivation, low self-efficacy, low work engagement, increased absenteeism and increased labour turn-over have been separately reported in many research studies (13, 15, 16-20). Absence of a comprehensive tool to measure organizational consequences of teacher stress was seen as a major drawback in research in this discipline. Using several tools to measure each construct results in long tools with several pages which increases the cost of the research. Some similar repeated questions, without uniform format may discourage the respondent. It consumes a lot of time to fill, which leads to fatigue and missing data (31). Thus, development of a comprehensive tool to assess OCOS fills the research gap.

This can be used by the service implementers to measure OCOS among secondary school teachers and direct them for necessary interventions to overcome them. The newly developed OCOST-Sinhala is a tool which can be self-administered in 20 minutes. Literature indicated that improving OCOS to be an important outcome aimed through any intervention to reduce teacher stress (32). It also has been highlighted as imperative to be used when advocating with the educational authorities to accept the interventions. Thus, the present study undertook to develop and validate OCOST-Sinhala, a culturally appropriate comprehensive tool to measure multiple OCOS among teachers in Sri Lankan secondary schools.

The development of the OCOST-Sinhala was a stepwise process, which involved a triangulation of quantitative and qualitative methods. Boateng et al. (2018) (33) describe the process of scale development in three phases with multiple steps. The first phase is

for items generation and assessment of content validity. In the second phase, the scale is constructed which includes pre-testing of questions, administering the survey, reducing the number of items and understanding how many factors the scale captures. In the third phase, scale is evaluated, the number of dimensions is tested, reliability is tested, and validity is assessed (34). The present study followed all these phases and elements in developing and validating the OCOST-Sinhala.

Both inductive and deductive methods were used, and it ensured that a comprehensive list of items were generated. Combining both deductive and inductive methods to define the domains and to generate items are considered the best practice (33). The number of items generated initially was 86. Reducing the items was carried out in two ways. Firstly, in the phase of developing the tool through the assessment of a panel of experts using modified Delphi technique and by conducting an PCA. Boateng et al. (2018) (33), advocates to assess content validity via evaluation by experts. This process reduced the number of items to 61.

OCOS questions were assessed for a period of one month to make it easier for the respondent to recall the required information, minimizing the recall bias. This tool included a five-point Likert scale which has been recommended that to adopt a minimum of five responses in scale development (34). Many measures were taken to minimize sampling errors in the study. The sample sizes for the studies for PCA and CFA was done as recommended by Tabachnick & Fidell (2010) (29) with an item to participant ratio of 1:5. The sample was achieved by best possible sampling technique using random sampling technique in order to minimize selection bias.

The PCA resulted in 53-item tool with 15 factors with Eigen values more than one, explaining 65.98% of the variability which can be considered acceptable. The 15 factors were combined to seven domains which were named work engagement, self-efficacy, motivation, job satisfaction, work performance, workload and enthusiasm.

In assessing the validity, appraising the criterion validity was not possible in the current study there was no defined gold standard measurement of OCOS. Thus, the present study adopted a triangulation of methods. The judgement validity of the tool was evaluated through an independent panel of experts of relevant fields of expertise (34). Boateng et al. (2018), advocated, CFA to assess the dimensionality of the tool which is a form of construct validity (23). The present study conducted a CFA and a multi-trait scaling to confirm scale structure of the tool.

All the indices used to evaluate the fitness of the model, except χ^2 test (2111.65), goodness of fit index (0.78) and adjusted goodness of fit index (0.76) confirmed that the statistical fitness of the original seven factors model to provide valid results in construct validity.

CFA resulted in the Final OCOST-Sinhala with the 45 items in seven domains. Multi-trait scaling analysis further confirmed the construct validity. Reliability of OCOST-Sinhala was assessed and confirmed by way of internal consistency and the Cronbach's alpha was evaluated against the well accepted based Nunnally's criteria of 0.7 for good internal consistency. Acceptability of the translated OCOST-Sinhala was confirmed by high response rate, and high rate of completion for domains along with low percentage of missing data. Though not specified as essential by Boateng et al. (2018) assessing acceptability was considered an important aspect of validity in the Sri Lankan setting (33).

Final OCOST-Sinhala has seven domains. Similar constructs have been used in other studies to assess OCOS. Though OCOS was not assessed using a comprehensive tool, eight studies included in a systematic review (35) had assessed the effectiveness of the interventions in reducing different aspects of OCOS among teachers (on job satisfaction (21), on-

efficacy (26) and satisfaction (22), on teaching efficacy (27), on satisfaction (32), on work ability (23), teachers efficacy (24) and self-efficacy (25)). For the purpose of classifying the respondents on whether they experienced low or high occupational consequences, a locally valid scoring system was designed using an objective method. This method was also confirmed by an independent panel of experts to ensure its validity. The evidence of all these confirmed that the OCOST-Sinhala was a valid, reliable and an acceptable tool to measure OCOS among secondary teachers. The limitation of this study is on the generalizability (36) as this was conducted among Sinhala speaking secondary teachers in the Western Province, and use of this tool in a different population needs cautious exploration.

Conclusions & Recommendations

OCOST-Sinhala is a valid and reliable tool to measure OCOS among secondary teachers.

Table 2: Rotated factor loadings of the OCOST-Sinhala items

Items	Components														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
I am able to get students to believe they can do well in schoolwork	**.833**	.169	.088	.109	.077	.113	.104	.044	-.012	.069	.033	.066	.009	.081	.019
I am able to instill desire for learning in my students	**.787**	.194	.073	.113	.127	-.003	.098	.040	.046	.167	.106	.008	.014	.071	.072
I am able to motivate stud35ents who show low interest in schoolwork	**.724**	.188	.122	.050	-.012	.200	.182	.071	.064	.062	.127	.094	.044	.065	.010
I am able to craft good questions for my students	**.698**	.201	.162	.084	.056	.041	.098	.156	.026	.126	.131	-.031	.145	.028	-.048
I am able to control disruptive behavior in the classroom	**.687**	.044	.137	.124	.055	.157	-.005	-.041	-.052	.268	.051	.102	.010	-.048	.248
I am able to establish a classroom management system	**.682**	.141	.192	.112	.305	.152	-.002	.170	-.044	.077	.001	.028	-.023	-.033	.016
I am able to use a variety of student assessment strategies	**.566**	.127	.199	.072	.395	.071	.106	.240	-.051	-.004	.070	.072	.055	.045	-.062
I am able to provide an alternative explanation for example when students were confused**	**.559**	.131	.125	.118	**.408**	.013	.160	-.057	-.110	.105	-.061	-.013	.007	.084	.107
I was enthusiastic about teaching	.213	**.723**	.250	.075	.129	.114	.146	.105	-	.071	.049	.014	-	.092	.082
When I taught, I felt strong and vigorous	.212	**.720**	.262	.102	.047	.184	.085	.087	-.074	.016	-.014	.065	.008	.059	.079
My work as a teacher is very meaningful to me	.158	**.698**	.160	.028	.066	.038	.078	-.004	-.084	-.028	.117	.081	.058	.037	.044
I felt happy when I was working intensely	.235	**.647**	.181	.222	.060	.084	.116	.069	.028	.106	.055	.058	.144	-.006	-.088
I was deeply involved in teaching	.183	**.615**	.109	.371	.073	.088	.112	.120	-	.199	.032	-	.158	.038	-

I was proud of teaching**	.261	**.609**	.106	.406	.134	.097	.123	.066	.039	.080	.021	.041	.173	-.043	-.097
When I got up in the morning, I felt like going to school	.049	**.603**	.198	.252	.030	.154	.061	.169	-.068	.254	.091	.068	-.041	-.115	.013
I was able to set the right priorities when planning my schoolwork	.176	.103	**.746**	.056	.136	-.054	.075	.071	.078	.021	.045	.022	.080	.085	.007
My planning of schoolwork was optimal	.121	.211	**.739**	.033	.036	.156	.069	.063	-.115	.084	.109	.098	-.005	-.004	.005
I was mindful of the timeline for my work	.161	.209	**.730**	.080	.093	.101	.147	-.001	-.125	.037	.096	-.008	-.013	-.014	.062
I managed to do my work at school on time	.130	.135	**.697**	.093	-.053	.178	.065	.063	-.040	.057	.061	.096	-.016	-.174	.040
I was able to perform my schoolwork well with minimal time and effort	.174	.213	**.687**	.001	.176	.031	.116	.131	-.088	.105	.033	.046	.171	.063	-.038
I was able to collaborate productively with others at school	.059	.302	**.444**	.128	.255	.145	.049	-.116	-.134	.095	.010	-.037	.333	.216	.143
Being a good teacher has been one of my goals in life	.169	.291	-.032	**.615**	.172	.057	.124	.097	-.024	.077	.104	.050	-.110	-.005	.087
I think I am more useful to the community as a teacher than any other profession	.167	.182	.036	**.605**	-.097	.146	-.015	.182	-.038	.035	.189	.000	.291	.039	.038
Teaching gave me recognition and respect from the community	.222	.243	.052	**.601**	.135	.303	.162	.021	.044	.129	.149	.049	.056	-.014	.091
The challenges in teaching encourage me	.173	.244	.187	**.544**	.110	.180	.236	.036	.066	.287	.044	.128	-.021	-.042	-.157
I think of finding a new job for me since I am fed up with teaching	-.078	-.231	-.211	**-.532**	-.002	-.043	.047	-.028	.192	-.068	.032	-.350	.005	.088	-.075
I am able to implement alternative teaching strategies in my classroom	.344	.179	.088	.068	**.654**	.128	.150	.060	-.025	.142	.156	-.025	.098	.064	-.028
I am able to convince parents to support activities in the school	.303	.054	.183	.108	**.630**	.201	.037	.200	-.006	.240	.030	.052	.080	-.014	.085
I am able to engage the families to help their children with schoolwork	.315	.217	.147	.028	**.556**	.243	.003	.182	.135	.167	.079	.034	.081	-.069	-.030
I am able to convince the principal to support activities that I proposed*	.268	.029	.185	.058	.395	**.068**	.089	.303	.131	.271	.116	.353	.191	-.079	.034
I was satisfied with the way I engaged with parents	.220	.217	.109	.119	.178	**.688**	.028	.153	-.021	.028	.231	.084	.042	.020	-.055
I was satisfied with my involvement in extracurricular activities	.201	.149	.171	.181	.178	**.650**	.014	.248	.006	.134	.088	-.020	.076	-.052	.163
I was satisfied with my quality of student-teacher relationships	.375	.223	.149	.229	.069	**.565**	.127	.070	-.137	.080	.036	-.092	.035	.103	-.031

I was satisfied with the support from the supervisory staff of the school**	.092	.151	.194	.113	.102	**.541**	.089	.030	.001	.056	.212	**.444**	.203	.084	.015
I worked at keeping my knowledge as a teacher up to date	.246	.162	.302	.136	.035	.082	**.760**	.147	-.037	.041	-.058	.022	.061	.059	.048
I worked at keeping my teaching skills up to date	.294	.192	.270	.194	.102	.062	**.743**	.142	-.057	.036	-.027	.027	.046	.134	.052
I plan for career development in the teaching profession	.021	.364	-.172	-.301	-.006	.116	**.465**	.123	.049	.130	.249	.099	.161	-.005	-.017
I did more than was expected of me as a teacher	.281	.324	.122	.189	.130	-.083	**.419**	.071	-.016	.166	.140	-.104	.014	.118	.103
I grasped opportunities when they presented themselves	.156	.231	.194	.100	.200	-.035	**.407**	.243	-.022	.049	.288	-.043	-.088	-.093	.324
I started new tasks myself, at school e.g., annual projects	.081	.159	.148	.072	.098	.159	.104	**.790**	.041	.096	.088	.045	-.043	.000	.051
I took on challenging activities at school when available	.147	.077	.039	.079	.186	.115	.168	**.747**	-.036	.110	-.075	-.076	.152	.098	.018
Teaching enabled me to interact and develop relationship with people from different areas	.259	.184	.051	.224	-.023	.078	.116	**.455**	.109	-.038	.237	.245	.122	.039	.118
I did less than was expected of me as a teacher	.065	-.121	.022	-.089	-.138	.108	-.037	.023	**.742**	-.056	-.010	.024	.160	-.129	-.151
I had to make requests several times to reduce my responsibilities other than teaching	-.036	-.051	.012	.047	.018	-.179	-.002	.044	**.655**	.103	.000	-.177	-.247	.321	.028
I couldn't manage my schoolwork that I was able to manage earlier	-.090	-.062	-.355	-.007	.107	-.041	.003	-.096	**.609**	-.187	-.024	.100	.119	.077	.216
I felt overwhelmed with the work that I had to do	.006	-.078	-.204	.024	.216	-.073	-.059	.093	**.558**	-.137	-.080	-.245	-.144	.129	.215
At my job, I was very resilient, mentally even when things didn't go well	.328	.154	.118	.124	.114	.004	.047	.093	-.129	**.659**	.045	.147	.143	.029	.000
The responsibilities I perform in the school gave a sense of control	.232	.082	.074	.215	.199	.113	.073	.112	-.047	**.646**	.032	.064	-.029	.105	.107
I am seen as an effective teacher by colleagues/parents	.325	.241	.125	.049	.180	.084	.083	.039	-.054	**.558**	.068	.100	.088	-.017	.063
I was satisfied with the classroom environment	.155	.072	.132	.141	.017	.220	-.084	.021	-.082	.099	**.745**	-.126	.067	.087	-.072
I was satisfied with the training programs I received	.147	.171	.113	.072	.136	.121	.126	.044	-.004	-.015	**.734**	.084	.012	-.043	.107
I think of transferring to another school because I can't handle my work in this school	-.102	-.115	-.034	-.075	.012	-.069	.015	-.017	.142	-.180	.065	**-.729**	.109	.030	-.137

I was satisfied with the facilities provided at school**	.053	-.117	.142	.291	-.005	-.054	.094	.087	.034	.137	**.415**	**.425**	.303	.127	-.170
I was worried about unimportant work in my day-to-day work*	-.051	.007	-.060	-.144	-.218	.134	.276	.072	.348	.237	.070	-.372	-.042	-.037	.193
I was satisfied with my quality of relationships with other teachers at school	.092	.164	.047	.138	.193	.255	.395	.068	-.017	.001	.132	-.059	**.586**	-.043	.057
I was able to propose creative solutions to new problems at school	.136	.232	.282	.009	.160	.037	-.100	.263	.031	.262	.038	.021	**.570**	.159	.122
I spoke with colleagues about the negative aspects of my schoolwork more than positive aspects	.136	-.007	-.091	-.088	-.049	.000	.061	.014	.154	.058	.017	-.034	.027	**.806**	-.069
I actively looked for ways to improve my performance at school	.086	.266	.271	.064	.117	.286	.142	.252	.019	-.083	.078	.236	.101	**.454**	.147
I actively participated in meetings at school*	.071	.120	.274	.189	.238	.101	.128	.155	-.252	.117	.110	.031	.138	.380	.331
I continued teaching extra hours even after schoolwork	.113	-.013	.072	.067	.014	.066	.125	.085	.131	.120	.021	.113	.059	.001	**.654**
I was satisfied with the financial benefits I received from this job*	-.134	-.003	.172	.162	.123	.263	.238	.063	.091	.194	.264	.270	-.052	.090	-.388
Highest eigen values of each component	**.833**	**.723**	**.746**	**.615**	**.654**	**.688**	**.760**	**.790**	**.742**	**.659**	**.745**	**-.729**	**.586**	**.806**	**.654**

* Items which were removed since they did not load to any component

** Items which were removed since they loaded to two components

Table 3: Components of the OCOST and the number of items in each component

Components	**No. of items**
Work performance	4
Workload	3
Work engagement	6
Motivation	13
Enthusiasm	4
Job satisfaction	5
Self-efficacy	10
OCOS Total	**45**

Table 4: Summary of model fit statistics for models of OCOST-Sinhala

Model	Sig*	RMSEA*(<0.08)	GFI* (>0.9)	AGFI* (>0.9)	SRMR* (<0.08)	CFI* (>0.9)	NNFI* (>0.9)	PGFI* (>0.5)	PNFI* (>0.5)
One factor	χ^2=4823 df =1325 p<0.01	0.1	0.59	0.56	0.083	0.9	0.9	0.55	0.83
Five factor	χ^2=3655 df=1315 p<0.01	0.08	0.69	0.66	0.072	0.94	0.93	0.63	0.86
Six factor	χ^2=3520 df=1310 p<0.01	0.076	0.7	0.68	0.072	0.94	0.94	0.64	0.86
Seven factor	χ^2=3266 df=1304 p<0.01	0.07	0.73	0.7	0.073	0.94	0.94	0.66	0.86
Seven factor	χ^2=2111 df=924 p<0.01	**0.065**	**0.78**	**0.75**	**0.064**	**0.95**	**0.95**	**0.69**	**0.86**

*Root mean square error of approximation (RMSEA), goodness of fit index (GFI), adjusted goodness of fit index (AGFI), standardised root mean square residual (SRMR), comparative fit index (CFI), Non-Normed Fit Index (NNFI), Parsimony Goodness of Fit Index (PGFI), Parsimony Normed Fit Index (PNFI)"

Table 5: Summary of item-domain correlations of the OCOST-Sinhala

Domains	Range of item-domain correlations
Items in work engagement (WE)	0.661, 0.861
Items in workload (WL)	0.558, 0.857
Items in the enthusiasm (ENTU)	0.513, 0.85
Items in self-efficacy (SE)	0.501, 0.787
Items in motivation (MO)	0.541, 0.656
Items in job satisfaction (JS)	0.485, 0.751
Items in work performance (WP)	0.183, 0.619

Author Declarations

Competing interests: The authors declare that they have no competing interests.

Ethics approval and consent to participate: Ethical approval was obtained from the Ethical Review Committee, Faculty of Medicine, University of Colombo, Sri Lanka (EC-18-126). Informed written consent was obtained from all the study participants prior to data collection.

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preparation of the research paper. All authors contributed to interpretation of the data, substantively revised the manuscript, and approved the final version.

Public Health Implications

- Newly developed OCOST-Sinhala is a valid, reliable and an acceptable tool to measure OCOS among secondary teachers. It is recommended that OCOST-Sinhala to be used in the community settings by primary health care workers to identify OCOS among secondary teachers.

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