



## Prepare and Standardize the Knowledge, Attitude and Practice Scale/Tool regarding Covid-19

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**ABSTRACT:** Since the first case was diagnosed in 2019 and global outbreak started in 2020, the corona virus disease 2019 (Covid-19) has become one of the world's most critical health problems. Covid-19 was first detected in December 2019 in Wuhan, China. Corona virus rapidly spread in crowded area. Paschim Medinipur district is over populated place, therefore it may control with the help of adequate knowledge, positive attitude and to avoid risky practice regarding Covid-19. Therefore, the present study mainly focuses on the construction and standardization of a usable scale/ tool that will help the researcher to know about the knowledge, attitude, and practice (KAP) regarding Covid-19 of undergraduate college students. Education system of India was fully affected for last two years due to Covid-19 pandemic. Total education system was converted as a novel teaching and learning approaches as digital online learning or virtual classroom during this pandemic phase. This study conducted on fifty undergraduate students, who has been participated for item analysis and sixty undergraduate students was considered for reliability test for this study from different colleges of Paschim Medinipur district. Researcher has generated the items of questionnaire/scale based on the review of literature related to Covid-19 and finally addition or alteration by the experts was done. This questionnaire/scale was divided into three sections i.e. knowledge, attitude and practice section/portion. Knowledge and attitude sections are divided into five and four dimensions respectively. Likert type summative three point rating scale was used in this scale. After construction of scales/tool researcher analysed the items based on discrimination index and difficulty value and Pearson's product-moment coefficient of correlation (r) was used for the reliability of the scale/tool. Initially, the scale was prepared with the help of 32 knowledge items, 23 items related to attitude and 12 items related to practice. Finally, after item analysis, it was found that in the knowledge section 19 items were accepted out of 32 items, in attitude section 19 items were accepted out of 23 items and in practice section 11 items were retained out of 12 items. The test – retest method was applied for reliability test and Pearson's Product Moment method was used to determine the correlation between two tests of this scale. The coefficient of correlation (r) of the scale was found as 0.89, 0.83 and 0.78 of knowledge, attitude and practice section respectively, which is highly significant. The present study describes how to construct a standardized tool to assess knowledge, attitude, and practice regarding Covid-19 that has a good items and significant reliability.

**KEY WORDS:** Attitude, Covid-19, Item Analysis, Knowledge, Practice.

### INTRODUCTION

Coronavirus Disease 2019 (Covid-19) is actually an infectious disease which is caused by the severe acute respiratory syndrome Coronavirus-2 (SARS-CoV-2) (Anonymous, 2022a). Covid-19 has become one of the most serious health issues worldwide since the first case was confirmed in 2019 and the global outbreak occurred in 2020 (Zhu, *et. al.*, 2020; Chu and Li, 2022). Covid-19 was spread around the world at an unprecedented speed. It is a highly contagious disease caused by Coronavirus-2 also known as SARS-CoV-2 (Park, 2021). Later, the WHO declared Covid-19 a "Global Pandemic" (Tang, *et. al.*, 2020; Al-Hanawi, *et. al.*, 2020). According to WHO, up to July, 2022 total number of Covid-19 cases around the world reached 55.5 crore, of which died 63.5 lakhs people and now active cases in the world are 2.7 lakhs. Whereas overall infected cases in India according to Ministry of Health and Family Welfare are 4.36 crore, death 5.25 lakhs and new cases 1.3 Lakhs. In West Bengal where the total numbers of cases are 20.5 lakhs, where death rate is 2.1 thousand and active cases are 2.962 (approx.) up to July, 2022 (Anonymous, 2022b). In December 2019, Covid-19 was identified in Wuhan, China and ultimate it was spread across the world and took final



shape as a pandemic. It has some common but noticeable symptoms like fever, cough, breathing difficulty, fatigue, loss of weight and loss of taste (Madhura, *et. al.*, 2021). Symptoms can be realized within fourteen days after infection and the exposure of the virus into the blood (Oran and Topol, 2021). Throughout its journey in the host body, it takes a few days in the throat and then goes to lungs and damages the alveoli and gradually infects other major organs. Older people with heart issues, diabetic, high blood pressure are at higher risk. Even some people are still suffering from many difficulties viz. immunity issue, fatigue etc. after recovery from the diseases (anonymous, 2021b).

The WHO has already declared some guidelines for the prevention and management of infection. It includes for proper maintenances of hand cleanliness washing, using alcohol-based hand sanitizer, wearing face masks and maintain social distancing, avoidance of crowded, self-isolation, and medical attention for a person with mild symptoms viz., fever, cough and headache (Anonymous, 2022a; Singh, *et. al.*, 2022).

It has already been found that human transmission of Covid-19 is possible through various ways such as eyes, nose and oral routes and predominantly from the person contact through a sneeze, coughing, inhalation, etc. (Hossain, *et. al.*, 2020). Proper medical treatment prescribed by the physician including medicines and vaccine and also maintaining Covid-19 protocols can be the main way of preventing this disease. Though till now any particular medicine for Covid-19 is neither available in markets nor in hospitals. Hopefully, vaccines are available in all medical health care services in India and most of the citizens have already been vaccinated by the Government. Therefore, preventive measures should be taken to minimized the infection where many countries have applied wide-ranging quarantines, travel restrictions, sick isolation, contact-tracing, and physical distancing measures to limit the spread of the disease and reduce the number of cases (Anonymous, 2021a; Barker, *et. al.*, 2021).

People are facing a large problem in daily lifestyle due to Covid-19 pandemic. This is really a tough challenge for people to get rid from this pandemic. The Covid-19 pandemic is striking the world with serious public health and socioeconomic complication. The pandemic has influenced all forms of daily life, including educational institution (Raza, *et. al.*, 2021). Most of the workers, employees couldn't attend their job, many people even could not arrange their food on time. Truly, it was the most crucial and miserable situation that the common people have ever faced. We can say that this Covid-19 has serious impact on the normal and social life of every person.

Covid-19 and lockdown rapidly impacted on education system in India. During lockdown, since all schools along with other teaching institution were closed and class room teaching of school and college were replaced by online teaching by use of various apps like Zoom, WebEx, Google Meet etc. (Sharma, *et. al.*, 2021). During lock-down phase, online teaching and learning has become a new routine that may lead to changes in lifestyles and adversely affect university students' health (Chu and Li, 2022). Whole countries and cities were isolated, public and private institutions ceased their activities, and the country's higher educational institutions were forced to stop full time education and switch to distance learning (Lyubetsky, *et. al.*, 2021). All educational sectors, schools, institutions, and universities in which teaching and learning classroom system was replaced from face to face learning to learning at home using digital online source especially for students of the university (Cahyadi, 2021). Total education system is converted as a novel teaching and learning approaches as digital online learning or virtual classroom during this pandemic situation. Most of the students faced uncomfortable at first but after some time they fully adjusted to this novel teaching- learning approaches. Teachers and students are supposed to be technology literate including the operating and implementing online learning using some digital platforms (Cahyadi, 2021).

In West Bengal, Paschim Medinipur is a over-populated district. Up to 3<sup>rd</sup> January, 2022, total cases in Paschim Medinipur were 54,625, total discharge cases were 53,895 and number of deceased person were 514 and the total active case in Paschim Medinipur is still now 56 (Anonymous, 2022c). As Paschim Medinipur is a populated area, people should aware about the Covid protocols, like – adequate knowledge, positive attitude regarding Covid-19 and avoid risky activities in their daily life. In the wake of Covid-19 in India, the students of higher education are facing different challenges related to online teaching - learning process and they are prone to various health problems directly or indirectly due to spread of Covid-19 (Padmanaban, *et. al.*, 2021). That's why, this study mainly focuses on the construction and standardization of a suitable scale that will help the researcher to find out the knowledge, attitude and practice level regarding Covid-19 of undergraduate college students of Paschim Medinipur district, West Bengal.



## OBJECTIVES OF THE STUDY

This study is conducted to develop a questionnaire in order to evaluate knowledge, attitude, and practice (KAP) regarding Covid-19. It also identifies the difficult items from this questionnaire and modified or removed this item and standardised the questionnaire. The present study aimed at fulfilling the following objectives:

1. To find out of effective items for the final scale/tool and eliminate the poor items on the basis of item difficulty and discrimination values in the knowledge, attitude and practice scale regarding Covid-19.
2. To standardize the knowledge, attitude and practice scale/tool regarding Covid-19 by measuring its reliability.

## METHODOLOGY

### Population and sample:

A population is defined as a group of individuals with at least one common characteristic which distinguishes that group from other individuals (Best, *et. al.*, 2018). A population is selected by researcher according to research problem or interest of researcher. All undergraduate students of Paschim-Medinipur district in West Bengal is considered as population of this study.

The representative proportion of the population is called sample. To obtain a representative sample, the researcher selects each unit in a specified way under controlled condition (Koul, 2018). Fifty (50) undergraduate students are participant for item analysis and 60 undergraduate students are participant for reliability test in this study from different colleges of Paschim Medinipur district.

### Design:

Purposive sampling allows the researcher to select those participants who will provide the richest information, those who are the most interesting, and those who manifest the characteristics of most interest to the researcher (Best, *et. al.*, 2018). Purposive sampling technique has been used for the collection of relevant data in this study. It is a kind of non-probability or non-random sampling technique (Koul, 2018).

### Construction of Scale/Tool:

A questionnaire is used for the data collection, which has been developed by the researcher. Before generating the items researcher has gone through the review of literature regarding Covid-19 and prepared various items and checked or modified by the expert related in this field. The self-designed questionnaire divided into three sections viz. knowledge, attitude, and practice. Among them knowledge and attitude section of the scale were consisted with some dimensions. Finally this questionnaire was prepared with 19 questions regarding knowledge, 19 questions for attitude, and 11 questions about practice related issues.

The knowledge section consists of five dimensions, viz. general concept, transmission, prognosis and indication, prevention and awareness, treatment. Whereas, attitude section consists of four dimensions, viz. transmission, prevention, treatment and counselling, awareness. But practice section consists of 11 items without any dimension.

Likert's types summative three point rating scale is used in this knowledge and attitude section. For knowledge section each item was measured on three point continuum viz. yes/agree, no/disagree and don't know with score '1' and '0' respectively. The maximum and minimum scores to be obtained were 19 and 0 respectively (Rajashekar, *et. al.*, 2016). For attitude section each item was measured on three point continuum i.e. yes/agree, neutral, and no/disagree. Score system of this section is '3', '2' and '1' for favourable item and '1', '2' and '3' for unfavourable items.

The practice section of KAP questionnaire is composed of 11 items/statements. Each item has two possible responses; 'yes' and 'no'. where '1' is carried for right responses, '0' for wrong responses and 'yes' indicates the higher level of attitude and 'no' indicates the low level of attitude regarding Covid-19.

### Collection of Data:

After preparing the questionnaire, at first the researcher himself collected data from 50 undergraduate students of different colleges through questionnaire for items analysis and then collected data from 60 undergraduates students for reliability test of the questionnaire by used of test-retest method. So, it is also called primary data.



**Statistical Analysis:**

After data collection, data is organized in score and then every single item/data is analysed. For this item analysis, item difficulty and discrimination index formula are used. After the analysis, effective items and problematic items are identified on the basis of difficulty value and discriminatory index of each item. Effective items are selected for final scale and problematic items are eliminated. Item difficulty was determined by calculating the percentage of the respondent’s answering an item correctly. Item discrimination was also determined and the test- re-test method was followed for the determination of the item reliability. Pearson’s product moment co-efficient (r) was used for the determination of the co-relation between (test and re-test) two test (Karmakar, *et. al.*, 2021). At last interpreted of the correlation value by the S.K. Mangal (2019) interpretation formula.

**RESULT**

**According to objective - 1:** The below tables showed the effective items for the final scale/tool and eliminated the poor items on the basis of item difficulty and discrimination values in knowledge, attitude and practice scale/tool regarding Covid-19.

**Table- 1:** Item analysis of the knowledge scale regarding Covid-19

Item no.		p-value	DI	Item no.		p-value	DI
Before	After			Before	After		
K1	K1	0.76	0.36	K17	K8	0.80	0.50
K2	K2	0.80	0.43	K18	K9	0.50	0.21
K3*	-	0.94	0.14	K19	K10	0.56	0.71
K4	K3	0.74	0.29	K20*	-	0.98	0.07
K5*	-	0.12	0	K21	K11	0.58	0.36
K6	K4	0.70	0.43	K22	K12	0.68	0.36
K7*	-	0.94	0.21	K23*	-	0.90	0.14
K8*	-	0.98	0.07	K24*	-	0.50	0.14
K9*	-	0.12	0.21	K25	K13	0.86	0.21
K10*	-	0.18	0	K26	K14	0.82	0.43
K11	K5	0.68	0.50	K27	K15	0.64	0.36
K12*	-	0.18	0.14	K28	K16	0.72	0.36
K13*	-	0.76	0.07	K29	K17	0.60	0.57
K14	K6	0.76	0.50	K30*	-	0.44	0.14
K15	K7	0.68	0.50	K31	K18	0.36	0.57
K16*	-	0.26	-0.07	K32	K19	0.44	0.50

Note: \*Item Rejected

**Table-2:** Item analysis of the attitude scale of Covid-19

Item no.		p-value	DI	Item no.		p-value	DI
Before	After			Before	After		
A1*	-	0.96	0.14	A13*	-	0.38	0.14
A2	A1	0.18	0.36	A14	A12	0.84	0.57
A3	A2	0.86	0.29	A15	A13	0.82	0.57
A4	A3	0.88	0.43	A16	A14	0.28	0.64
A5	A4	0.28	0.43	A17	A15	0.38	0.64
A6	A5	0.78	0.71	A18	A16	0.72	0.50
A7	A6	0.78	0.36	A19	A17	0.90	0.36
A8	A7	0.74	0.43	A20*	-	0.14	0.07



A9	A8	0.76	0.43	A21	A18	0.22	0.57
A10	A9	0.16	0.57	A22	A19	0.64	0.57
A11	A10	0.28	0.57	A23*	-	0.90	0
A12	A11	0.86	0.43				

Note: \* Item Rejected

**Table-3:** The item analysis of practice test regarding Covid-19

Item no.		p-value	Item no.		p-value
Before	After		Before	After	
P1	P1	0.70	P7	P6	0.64
P2*	-	0.16	P8	P7	0.84
P3	P2	0.86	P9	P8	0.80
P4	P3	0.20	P10	P9	0.74
P5	P4	0.74	P11	P10	0.84
P6	P5	0.70	P12	P11	0.84

Note: \*Items Rejected

**Table- 4:** Distribution of knowledge, attitude and practice items on the basis of difficulty index (p-value)

p-value	Total Item		
	Knowledge	Attitude	Practice
Easy(p>0.90)	4	1	0
Moderately Difficult(0.20 - 0.90)	24	19	11
Difficult(p<0.20)	4	3	1

On the basis of set standards for the interpretation of difficulty indices 24 items of knowledge test were identified as moderately difficult and 4 items were identified as easy and 4 items were identified as difficult. From Table-1, it is clear that in case of knowledge test, 4 easy items and 4 difficult items were unable to satisfy the condition, these items were considered as ‘poor’ items. This ‘poor items were K3, K5, K7, K8, K9, K10, K12 and K20. In the Attitude test, 19 items were moderately difficult, 1 item was very easy and 3 items were very difficult. In the attitude test, 4 items were considered as ‘poor’ item. This item was A1, A2, A10 and A20. Table 3 Show that in Practice test, 1 item was considered as ‘poor’ item, this poor item of Practice test was P2.

**Table-5:** Discrimination of Knowledge & Attitude Items based on Discrimination Indices

Discrimination Index	Total Items	
	Knowledge	Attitude
Very Good(D>0.40)	11	15
Reasonably Good(0.30-0.39)	5	3
Marginal (0.20-0.29)	5	1
Poor(D<0.19)	11	4

According to the criteria of the discrimination index, results of the knowledge test indicates that 11 items failed to distinguish between students of different abilities, 5 items were marginal which needs to be reviewed, 5 items were satisfactory and



the function of the 11 items were very well. In the case of attitude test, 4 items failed to discriminate the different abilities of the students, 1 item was marginal, 3 items were satisfactory and 15 item’s function is very good.

**According to Objective - 2:** After item analysis researcher used test- retest method for reliability test of the tools. The test-retest method was used to determine the correlation between the two tests, and the duration between these two tests is 15 days. Pearson’s product-moment coefficient (r) was used to determine the reliability of the test items. After calculating the value of correlation is interpreted by using the S. K. Mangal’s interpretation formula. Interpretation co-efficient of correlation are shown in table 6 (Mangal, 2019).

**Table- 6:** Represents the interpretation of co-efficient of correlation

<i>The range of co-efficient (r)</i>	<i>Interpretation</i>
0 (zero value)	No relationship
From 0.00 to $\pm 0.20$	Negligible relationship
From $\pm 0.21$ to $\pm 0.40$	Low or small relationship
From $\pm 0.41$ to $\pm 0.70$	Moderate correlation
From $\pm 0.71$ to $\pm 0.90$	High Correlation
From $\pm 0.91$ to $\pm 0.99$	Very high correlation
$\pm 1$	Perfect correlation, identical or opposite relationship.

A general rule for interpretation of coefficient of correlation (Mangal, 2012)

**Table- 7:** Co-efficient of correlation between tests and re-test

<i>Test</i>	<i>co-efficient correlation (r)</i>
Knowledge	0.89
Attitude	0.83
Practice	0.78

Table no. 7 represents the value of coefficient of correlation (r) between test and re-test of this tool. And table no. 6 shows that, from  $\pm 0.71$  to  $\pm 0.90$  means there is a highly correlation, wherefore we can say that highly positive correlation is present between two tests regarding knowledge, attitude, and practice. Therefore this tool is reliable.

**Final form of knowledge scale:**

The final form of knowledge, Attitude & Practice scale contains 19, 19 & 11 items respectively covering all dimension of Covid-19.

**Table 8:** The distribution of the items after item analysis among different dimension of knowledge, attitude & practice about Covid-19

Test	SI. No.	Dimensions	Raw Score		Total items of the dimension	Total items
			Favorable	Unfavorable		
	1	General Concept	2	1, 3	3	
	2	Transmission		4, 5	2	





Knowledge Scale	3	Prognosis and Indication	6, 8, 9	7, 10, 11, 12	7	19
	4	Prevention and Awareness	13, 14, 16	15	4	
	5	Treatment	17	18, 19	3	
Attitude Scale	1	Transmission	2, 3	1, 4	4	19
	2	Prevention	5, 6, 7, 8, 11	9, 10	7	
	3	Treatment and Counseling	12, 13, 16	14, 15	5	
	4	Awareness	17, 19	18	3	
Practice Scale			11		11	11

## DISCUSSION

On the basis of difficulty index and discrimination index (DI), eight (8) and eleven (11) items of knowledge test were considered as poor item respectively. On the other hand, six (6) items of knowledge test (K3, K5, K8, K10, K12 and K20) that failed to satisfy the condition based on both difficulty index (p-value) and discrimination index (DI) were eliminated. Among the remaining items, the five (5) items of the knowledge scale, i.e., K13, K16, K23, K24 and K30 having moderate difficulty values of 0.76, 0.26, 0.90, 0.50 and 0.44 respectively had the very poor discrimination values of 0.07, -0.07, 0.14, 0.14 and 0.14 respectively, therefore although these five (5) items were also excluded/eliminated from the knowledge questionnaire. On the other hand, two items (K7 and K9) of knowledge scale having poor difficulty values of 0.94 and 0.12 respectively and marginal discrimination values of 0.21 and 0.21 respectively. So, this two items (K7 and K9) were also eliminated from the knowledge scale. Totally, only thirteen (13) items were eliminated from the knowledge scale and nineteen (19) items of knowledge scale were selected based on both difficulty value and discrimination value.

In the case of attitude test, two (2) items of attitude scale (A1, A20) that failed to satisfy the condition based on both difficulty index (p-value) and discrimination index (DI) was eliminated. Among the remaining items, two (2) items of attitude test, i.e. A13 and A23 having moderate difficulty values of 0.38 and 0.90 respectively had the poor discrimination values of 0.14 and 0 respectively. So, this two items (A13 and A23) were also eliminated from the attitude scale of Covid-19. On the other hand, two items (A2 and A10) of attitude scale having very low difficulty values of 0.18 and 0.16 respectively and had the very well discrimination values of 0.36 and 0.57 respectively. According to Varma (2008), item difficulty should not be considered as an indicator for assessing the quality of item, and only DI value of the item should be used to assess item quality. Therefore these two items (A2 and A10) may be included among the questionnaire without any doubt. Only four (4) items were eliminated from the final form of attitude test. And nineteen (19) items were selected in the attitude questionnaire.

In the test of Practice, one item (P2) was rejected on the basis of the standard set of difficulty index, and eleven (11) items were accepted in the final form of practice test regarding Covid-19.

## CONCLUSION

This study mainly focuses on the construction and standardization of tools related knowledge, attitude and practice, regarding Covid-19. The study represents at first, identifying of effective items and eliminate the problematic items through difficulty value and discriminate index and then the assessment of the test- retest reliability of items. The assessment of KAP regarding Covid-19 for undergraduate students is carefully made, it is a user friendly format, and evidence based, valid and reliable tools.

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