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Knowledge, Attitude and Practice towards COVID-19 Vaccination among adults of Sullia Taluk in Dakshin Kannada District of Karnataka- A Community based Survey)

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Abstract:- Background: Vaccination programs for corona virus disease (COVID-19) were initiated globally in a record time unparalleled in the history of immunisation. Thus the community's and perceptions towards COVID-19 vaccinations are poorly understood. This study thus aimed to investigate community knowledge, attitudes and practices towards COVID-19 vaccinations in Sullia Taluk of Dakshin Kannada.
Methods: An exploratory and anonymous population-based survey was conducted among 600 general individuals (58.17% male; 41.83% female). The survey was conducted using a validated self- administered questionnaire containing a set of questions pertaining to knowledge, attitudes, and practices. Multiple linear regression was performed to determine the variables predicting knowledge, and attitudes towards COVID-19 vaccinations.
Results: The mean scores of knowledges and attitudes were 2.73±1.48 and 9.44±2.39 respectively. About a quarter of participants thought that the COVID-19 vaccination available in India is safe, 60% reported that they will continue to have further vaccinations if necessary. About 54% reported recommending it to family and friends. Regression analysis revealed that higher SES, university/ higher levels of education, nuclear families and those with a previous history of essential vaccines uptake were associated with a higher knowledge score; whilst attitudes were significantly associated to gender and previous history of essential vaccines uptake. Just over half of the participants(54%) thought that everyone should be vaccinated. A majority of the population 72.17% population reported vaccine should be administered free of cost in India.

Keywords:- *Covid Vaccination; Survey; Karnatak.*

I. INTRODUCTION

The start of a coronavirus disease outbreak in 2019 (COVID-19) brought on by SARS-CoV-2 was first identified in Wuhan, China, in December 2019. [1].

- *On 11 March 2020, the WHO declared COVID-19 a worldwide pandemic.*

By the end of May, the COVID-19 had infected over 5 million people across 215 countries and caused more than 300,000 fatalities worldwide[2]. Since SARS-CoV2 is highly contagious and affects a large and global population, vaccinations are one of the most crucial public health measures and effective techniques to protect the population from COVID-19[3]. As the pandemic progresses, new, more potent vaccines are likely to be created, and the race to develop the COVID-19 vaccine to stop its spread and disastrous repercussions is still on. With the distribution of vaccines underway, it is very important to examine community acceptance of COVID-19 vaccinations. On 16 January 2021 India started its national vaccination Programme against the SARS-CoV-2 . In the first phase of the vaccination drive, the government prioritized healthcare and frontline workers. In the second phase, which started on 1st of march, people over the age of 60, and those over the age of 45 and suffering from certain comorbidities were considered eligible for vaccination. Subsequently, all the adults above 45 years were given eligibility to be vaccinated in Phase 3. According to health officials, India has administered approximately 82 million across the country as of 8th April 2021 which is about 6% of the country's population. However, there is a lot of debate about COVID-19 vaccines among the general public[4].

We must understand what individuals think, feel, and know about COVID-19 immunisations in order to adopt the most successful vaccination plan.

The COVID-19 vaccine Covishield from Oxford Institute, which is being developed by Serum Institute in Pune, and the Covaxin from Bharat Biotech have both been given the go-ahead for emergency use in India by the country's medicines regulator.

Every country in the globe is battling to stop the spread of COVID-19 because to the lack of a vaccine, a viable cure, lockdowns and quarantines, social isolation policies, the requirement to wear face masks, and travel restrictions [5]. According to a global assessment of possible COVID-19 vaccine uptake, 48 percent of the sample population was confused about the COVID-19 immunizations and remained unclear whether or not to get the vaccine. In a Chinese survey, only around half of the participants (54%) reported they planned to get the immunization[6]. Although protecting oneself from COVID-19 is the most efficient strategy of reducing the virus's transmission, it is also vital to vaccinate the vulnerable group of people as soon as feasible[7].

The main aim of the study is to investigate community knowledge, attitude, and practices towards COVID-19 vaccinations among permanent residents of Sullia taluk in Dakshina Kannada District of Karnataka.

II. METHODS AND MATERIAL

A. Methods, Participants and Procedure

To develop and validate a questionnaire which can quantitatively measure KAP on various parameters included in the study and to obtain data by conducting a household survey using the validated questionnaire, to compare the knowledge attitude and practice towards covid vaccination in sullia taluk in relation to various social demographic parameters included in the study.

B. Study Design

This study was designed as a cross-sectional web-based survey. The estimation of the sample size was done according to pathfinder survey procedures. The calculated sample size of this study was 600 participants. Individuals above the age of 18 were surveyed in an exploratory and anonymous population-based survey. The survey was carried out in Sullia-Dakshin Kannada, India, among the general population. Our goal was to collect real-world evidence to help policymakers and practitioners in India figure out how to best administer our vaccine programme.

C. Questionnaire Preparation and Data Collection

A house-to-house survey was conducted with the help of a semi-structured questionnaire. The investigators used all available safety measures, like as PPE kits, face shields, and sanitization, to collect data and minimise the risk of infection during the pandemic. 635 people gave their informed consent at the start. The questionnaire was answered by over 600 participants anonymously (58.17% male; 41.83% female). Demographic variables were recorded along with other factors regarding the populations' knowledge, attitude, practice, and risk assessment concerning COVID-19. The inclusion criteria of participants were i) being a Sullia resident, ii) being adults (≥18 years old), iii) having voluntary participation. The exclusion criteria included being under 18 years old and incomplete surveys.

- *Socio-Demographic Information*

Some questions related to socio-demographics were asked during the survey including age, sex (male/female), marital status (married/unmarried), educational status (primary/middle, High school, University, Masters), occupation, family type (nuclear/joint), monthly family income (later categorized based on Kuppuswamy scale)[8] and current residence (rural/urban). In addition, another "yes/no" question was asked about their previous history of taking all the recommended vaccines (i.e., Have you received all the necessary vaccines in your lifetime?)

- *Knowledge, Attitudes, and Practices*

A total of 18 structured questions were used to gauge the respondents' level of knowledge, attitudes, and perceptions (containing 7 items for knowledge, 7 items for attitudes, and 4 items for practises). Every question was based on a validated question from earlier research.

The knowledge section of the questionnaire consisted of 7 questions(K1-K7). These questions were in the form of yes, no or don't know opinions. The 'yes' response was coded as 1, while the 'No/ Don't know' responses were conducted as 0. The total score was obtained by summating the raw scores of seven items and ranged from 0-7, with the higher score indicating the greater level of knowledge towards COVID-19 vaccinations.

The attitude section consisted of 7-items (A1-A7) and the response of each item was indicated on a three-point Likert scale (i.e., 0 = Disagree, 1 = Undecided, and 2 = Agree). The total score was calculated by summating the raw scores of the Seven items ranging from 0 to 14, with an overall greater score indicating more positive attitudes towards COVID-19 vaccine.

The perceptions section included 4-items regarding participant's perceptions towards the COVID-19 vaccine.

III. STATISTICAL ANALYSIS

R Commander software and Microsoft Excel 2019 were used to analyse the data. The data was edited, sorted, and coded using Microsoft Excel. The R Commander software was then used to import the spreadsheet file. First-order analysis (i.e., chi-square tests, Fisher's exact test) and descriptive statistics (i.e., frequencies, percentages, means, and standard deviations) were carried out. To identify significant relationships between the mean knowledge and attitude scores and socio-demographic data, t-tests or one-way ANOVA testing were also used. Finally, a multivariate linear regression analysis was performed using knowledge and attitudes as the dependent variables, and components that significantly varied in terms of knowledge and attitudes scores were included.All statistical tests were considered significant at 95% confidence interval with a p-value less than 0.05.

IV. ETHICAL CONSIDERATION

The Helsinki Declaration's principles for conducting human research, as well as the institutional research ethics' ethical standards, were followed in all aspects of the current study. The institutional research ethics committee's ethical review board provided formal ethics approval. Participants in the study were made aware of the protocol, goal, and confidentiality of the data supplied. During the times when data was being collected, every participant gave their informed consent to participate in the study. All information was gathered anonymously, and the coding system was used to assess it.

V. RESULT

A. General Profile of Participants

The final study includes a total of 600 finished surveys. Males aged 18 to 65 made up 58.17% of them. The majority were single (70.33%), had only completed high school (83%) and had no college education (33.67). The majority (56.67%) were from nuclear families and (54.83%) were from cities. 24.33 percent of individuals said they hadn't gotten all the recommended vaccinations in their lifetime.

B. Knowledge about the COVID-19 Vaccine

The distribution of each COVID-19 vaccination knowledge item is shown in Table 2. The mean knowledge score was significantly higher for participants who reported having a bachelor's degree or above, nuclear families, belonging to the upper SES group, residing in cities, and having previously had all required immunisations (Table 5). Having a university degree or higher education, living in a nuclear family, having a higher SES, and having previously received all the recommended vaccinations were all factors that were significantly associated with knowledge in adjusted multiple regression using only variables that were statistically significant in bivariate analysis (Table 6).

C. Attitudes towards the COVID-19 Vaccine

Table 3 shows the distribution of each of the attitude's items for the COVID-19 vaccination. Participants who reported being male and having previously received all essential immunizations scored considerably higher on the attitude scale (Table 5). Using only variables that were statistically significant in bivariate analysis, adjusted multiple regression identified being male and having previously received all essential immunizations as factors substantially linked with attitudes (Table 6). The fact that nearly half of the participants (49.5 percent) believe the current COVID-19 vaccine in India is safe, that nearly 54.34 percent believe Covid-19 vaccines are essential for us, and that more than half of them (54.0 percent) would recommend the vaccination to family or friends is particularly interesting. As a result, public health efforts are required to positively influence attitudes toward the COVID-19 vaccine. Almost 72.17% of participants responded that the vaccine should be administered free of charge in Sullia, which was significantly higher among males versus females (74.2% vs. 69.3%, p = .02093).

D. Practices towards the COVID-19 Vaccine

Table 4 shows the distribution of each practice item related to the COVID-19 vaccination. The majority of those who took part in the poll (79.17%) had had their vaccine, with males receiving the most (82.8%). Furthermore, half of the participants (60.83%) said they would take the booster dosages. Over half of the participants (66.5%) said that everyone should wear a mask and keep social distance after immunization, and about three-quarters of the population (60.38%) said they would not purchase the vaccine on their own if it wasn't offered free of charge by the government.

VI. DISCUSSION

The COVID-19 vaccination has been positioned as the best option for stopping the pandemic that is still going on. Numerous nations have approved particular vaccines for use in immunisation programmes as a result of the development of numerous vaccine candidates and the recent release of various clinical studies with promising outcomes[9]. The government of India has already begun the COVID-19 immunisation roll-out, which offers promise as a component of a pandemic remedy. Covid immunisation was very recently introduced, therefore it raises questions about how well-informed, optimistic, and practised the general community is about it. To the best of our knowledge, this is the first study in Sullia looking at the general Sullia population's KAP toward receiving a COVID-19 immunisation. According to our findings, women, married persons, and those with more education had considerably higher KAP scores toward their COVID-19 scores. The majority of participants, as evidenced by their knowledge ratings, are knowledgeable of the COVID-19 immunisation. Our findings were consistent with a prior investigation of the KAP for the COVID-19 vaccine conducted in Bangladesh[9].

Numerous studies establishing connections between KAP variables and the COVID-19 vaccine have been crucial in helping to propose public health strategies that offer locally based strategic behavioral interventions and improved protection against future pandemics [10]. For vaccines to be widely accepted, it is crucial to identify and address trust issues. Vaccine acceptability is directly impacted by vaccination literacy. It is particularly crucial and pertinent at this time, when the nation is dealing with next wave of COVID-19 infection crisis and maybe bracing for a new surge in cases in the "third" wave. Knowledge is therefore essential to the success of vaccination campaigns.

As they reflect a wide range of socio-demographic factors that influence knowledge, attitudes, and perceptions of COVID-19 immunisations, our findings will be crucial in developing COVID-19 vaccination-related awareness and health education activities. In this study, knowledge was substantially connected with education, family type, family income, and past vaccination history. However, only prior experience to performing sex acts and delivering vaccines was significantly associated with beliefs. It's significant that half of the participants (54.34%) expressed that the COVID- 19 vaccination is essential for us.

In a related study, Sharun et al. found that about 85% of the 351 participants planned to receive the COVID-19 vaccination once it became available for purchase on the market[11]. However, fewer than two thirds of their patients were prepared to receive the vaccination as soon as it became available, and the main reason for vaccine reluctance was concern over potential side effects. In contrast to a study conducted in the US, 36 percent of participants in our study believed that the COVID vaccinations would have some negative effects[12]. 48 percent of respondents in a Chinese research postponed vaccination before the vaccine's safety had been confirmed, indicating that they had concerns about its efficacy [13].

Our study's findings are consistent with the findings of the IPSOS survey, according to which 87 percent of Indians accepted vaccinations [14]. Most cross-sectional surveys conducted around the world have found that the study individuals generally give consistent answers.

In this study, it was discovered that people who had ever gotten a vaccination knew more about COVID-19 vaccines. People who had previously had an influenza vaccination were found to be more likely to take the COVID-19 vaccine, according to a recent study in China analysing COVID19 vaccine acceptance. A similar finding was made in a study conducted in Hong Kong [15]. This propensity among people may result from prior favourable vaccination experiences. People who live in urban regions have much more information of COVID-19 immunizations than those who live in rural areas. Multiple regression didn't keep this link, though.

A positive mindset and acting responsibly during the COVID-19 pandemic were also significantly associated with having a higher knowledge score for the illness, according to our study. These findings emphasise the value of educating the general public about COVID-19 through health education initiatives in order to change their attitudes and increase their utilisation of COVID-19. According to our research on the KAP-related demographic factors, more specialised strategies are required for some demographic groups, such as young people, single men, and people with lower levels of education, in order to enhance health education support initiatives for COVID-19 awareness.

Concerningly, the extremely quick pace of vaccine development and the scepticism of some scientific and medical authorities may increase suspicion about the COVID-19 vaccine . Our survey found that 72.1% of participants in Sullia believed that the vaccination should be provided free of charge. In addition, a survey conducted in Ecuador revealed that 85% of the participants were willing to pay for the COVID-19 immunisation [16]. This distinction from the other nations may be due to the poor financial standing of the populace in a region like Sullia in India, which has been made worse by the fact that many people have lost their means of support due to COVID-19 lockdowns and quarantines, which has also contributed to unemployment and social unrest and left many people unable to afford the COVID-19 vaccine.

VII. CONCLUSION

The quick development of the COVID-19 vaccination may have accelerated the emergence of public anxiety [17]. Depending on sociodemographic factors, the COVID-19 vaccine's acceptance and level of awareness varies. The prevalence of mild or major adverse reactions after vaccination is the main cause of vaccine reluctance, and this could be the biggest obstacle to a successful worldwide pandemic response.

It is critical to adopt behavior that is preventive in nature during any pandemic or public health disaster. Herd immunity occurs when there is a successful vaccination programme in a given community. Through community-wide immunisation campaigns, the rate of transmission can be slowed down. A thorough grasp of the public's knowledge, attitude, and practise regarding vaccination uptake is necessary for the effectiveness of the same. According to the results of our study, those who are knowledgeable about COVID-19 infections recognise the value and efficacy of vaccines. This study has also revealed a critical link between attitude and knowledge that is represented in practise. Although awareness of the COVID vaccination does not directly influence preventative practises or immunisation participation, it does so indirectly through attitude, which acts as a mediating factor in this relationship. For hospital administrators and public health specialists developing community-based intervention methods, these findings will be crucial.

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Table 1: General characteristics of participants (N = 601)

Variables	n	%
Gender		
Male	349	58.17
Female	251	41.83
Marital status		
Married	178	29.67
Unmarried	423	70.33
Education		
Primary/middle	100	16.67
High school	265	44.17
University	202	33.67
Masters	33	5.5
Family type		
Nuclear	340	56.67
Joint	260	43.33
Monthly income		
○ ≥199,862	90	15
○ 99,931-199,861	53	8.83
○ 74,755-99,930	66	11
○ 49,962-74,755	94	15.67
○ 29,973-49,961	128	21.33
○ 10,002-29,972	91	15.17
○ ≤10,001	78	13

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Residence		
Rural	271	45.17
Urban	329	54.83
Have you received all the necessary vaccines in your lifetime?		
Yes	454	75.67
No	146	24.33

Table 2: Distribution of each knowledge item and sex difference

variables	Total		Male		Female		χ 2	df	p-value
	n	%	n	%	n	%			
Do you know about the COVID-19 vaccine?									
Yes	459	76.5	284	81.4	175	69.7	11.198	2	0.003701*
No	104	17.33	49	14.0	55	21.9			
Don't know	37	6.17	16	4.6	21	8.4			
Do you think you will get lifetime immunity after this vaccination									
Yes	349	58.17	226	64.8	24	49.0	15.52	2	0.0004264*
No	199	33.17	95	27.2	104	41.4			
Don't know	52	8.66	28	8.0	24	9.6			
Do you know that every vaccination is associated with common symptoms									
Yes	266	44.33	165	47.3	101	40.2	3.35	2	**0.1874***
No	194	32.33	104	29.8	90	35.9			
Don't know	140	23.33	80	22.9	60	23.9			
Do you think the COVID-19 vaccine may have side effects?									
Yes	216	36	133	38.1	83	33.1	1.66	2	0.444
No	226	37.67	126	36.1	100	39.8			
Don't know	158	26.33	90	25.8	68	27.1			
Do you feel covid 19 vaccination may cause allergic reactions?									
Yes	250	41.66	151	43.3	99	27.5	1.03	2	0.594
No	187	31.17	104	29.8	83	33.1			
Don't know	163	27.17	94	26.9	69	39.4			
Do you know about the registration procedure in India to get vaccinated									
Yes	323	53.83	198	56.7	125	49.8	2.833	2	0.242
No	164	27.33	89	25.5	75	29.9			
Don't know	113	18.84	62	17.8	51	20.3			
Do you think that if everyone in the society maintains the preventive measures, the COVID-19 pandemic can be eradicated without Vaccination?									
Yes			144	41.3	99	39.4	2.366	2	0.3064
No			72	20.6	65	25.9			
Don't know			133	38.1	87	34.7			

Note: *Bold indicates significant

Table 3: Distribution of each attitude item and sex difference

variables	Total		Male		Female		χ 2	df	p-value
	n	%	n	%	n	%			
COVID-19 vaccine will be effective in controlling this pandemic									
Disagree	77	12.83	50	14.3	27	10.8	9.813	2	**0.00776***
Undecided	222	37.0	111	31.8	111	44.2			
Agree	301	50.17	188	53.9	113	45.0			
The COVID-19 vaccines are safe.									
Disagree	73	12.17	42	12.0	31	12.4	11.441	2	**0.00326***
Undecided	230	38.33	115	33.0	115	45.8			
Agree	297	49.5	192	55.0	105	41.8			

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The COVID-19 vaccines are essential for us.									
Disagree	71	11.83	43	12.3	28	11.2	4.4784	2	0.109
Undecided	203	33.83	106	30.4	97	38.6			
Agree	326	54.34	200	57.3	126	50.2			
I will also encourage my family/friends/ relatives to get vaccinated.									
Disagree	50	8.33	30	8.6	20	8.0	1.93	2	0.384
Undecided	208	34.67	113	32.4	95	37.8			
Agree	324	54.0	206	59.0	136	54.2			
It is not possible to reduce the incidence of COVID-19 without vaccination.									
Disagree	97	16.17	55	15.8	42	16.7	2.5181	2	0.283
Undecided	273	45.5	151	43.3	122	48.6			
Agree	230	38.33	143	41.0	87	34.7			
The COVID-19 vaccine should be distributed fairly to all of us.									
Disagree	36	6.0	26	7.4	10	4.0	14.188	2	**0.0009***
Undecided	145	24.17	66	18.9	79	31.5			
Agree	419	69.83	257	73.6	162	64.5			
Do you think the vaccine should be administered free of charge in Sullia?									
Disagree	33	5.5	24	6.9	9	3.6	7.7336	2	**0.02093***
Undecided	134	22.33	66	18.9	68	27.1			
Agree	433	72.17	259	74.2	174	69.3			

Note: *Bold indicates significant

Table 4: Distribution of each practice item and sex difference

variables	Total		Male		Female		χ 2	df	p-value
	n	%	n	%	n	%			
Have you received your COVID 19 vaccination									
Yes	475	79.17	289	82.8	186	74.1	7.6615	2	**0.02169***
No	125	20.83	60	17.2	65	25.9			
Do you always wear mask and maintaining social distance after vaccination									
Yes	399	66.5	249	71.3	150	59.8	8.2845	1	**0.003998***
No	201	33.5	120	28.7	101	40.2			
If booster dose is provided are you likely to take it?									
Yes	365	60.83	229	65.6	136	54.2	7.5366	1	**0.006046***
No	235	39.17	120	34.4	115	45.8			
Would you buy the booster dose of vaccine at your own expense if it is not provided free by the government?									
Yes	235	39.17	154	44.1	81	32.3	8.1216	1	**0.004374***
No	365	60.83	195	55.9	170	67.7			

Note: *Bold indicates significant

Table 5: Group difference analysis (bivariate) with knowledge and attitudes scores

variables	Knowledge				Attitude			
	Mean	**SD**	**t/f**	**p-value**	**Mean**	**SD**	**t/f**	**p-value**
Gender								
Male	2.73	1.46	0.72	0.73	9.26	2.32	5.02	**0.026***
Female	2.70	1.56			9.15	2.24		
Marital status								
Married	2.79	1.42	1.249	0.242	9.29	2.29	2.89	0.83
Unmarried	2.68	1.61			9.08	2.42		
Education								
Primary/middle	2.32	1.49	15.57	**<0.001**	9.46	2.37	0.39	0.562
High school	2.54	1.53			9.37	2.48		
University	2.67	1.47			9.48	2.43		

Masters	2.72	1.49			9.33	2.40		
Family type								
Nuclear	2.85	1.51	10.32	**<0.001**	9.48	2.37	1.73	0.182
Joint	2.63	1.52			9.22	2.58		
Monthly income								
≥199,862	3.21	1.48	15.28	**<0.001**	9.58	2.37	2.29	0.059
99,931-199,861	3.16	1.43			9.53	2.17		
74,755-99,930	3.08	1.56			9.49	2.42		
49,962-74,755	2.84	1.45			9.42	2.44		
29,973-49,961	2.72	1.52			9.36	2.19		
10,002-29,972	2.64	1.55			9.31	2.39		
≤10,001	2.53	1.47			9.22	2.48		
Residence								
Rural	2.53	1.49	12.99	**<0.001**	9.62	2.32	3.29	0.072
Urban	2.87	1.42			9.18	2.56		
Have you received all the necessary vaccines in your lifetime?								
Yes	2.89	1.38	28.32	**<0.001**	9.54	2.49	5.72	**<0.001**
No	2.56	1.52			9.292	2.17		

Note: *Bold indicates significant

Table 6: Multivariate regression analysis predicting knowledge and attitudes toward the COVID-19 vaccine

variables	Knowledge					Attitude				
	B	SE	β	t	p-value	B	SE	β	t	p-value
Gender	-	-	-	0	-	0.263	0.127	0.062	2.412	**0.027***
Education	0.29	0.08	0.08	3.72	<.001	-	-	-	-	-
Family type	-0.24	0.08	-0.06	-2.84		-	-	-	-	-
Monthly income	0.21	0.06	0.13	3.77	<.001	-	-	-	-	-
Residence	0.16	0.08	0.07	1.82		-	-	-	-	-
Vaccination history	-0.40	0.07	-0.13	-4.85	<.001	-0.420	0.152	-0.059	-2.54	**0.019***

Note: B=unstandardized regression coefficient; SE=Standard error; β=standardized regression coefficient; [a]1=Male, 2=Female;
[b]1= Primary/middle, 2= High school, 3=university, 4=masters;
[c]1= Nuclear, 2= Joint; [d]1=≥199,862, 2=99,931-199,861, 3=74,755-99,930, 4=49,962-74,755, 5=29,973-49,961, 6=10,002-29,972, 7=≤10,001; [e]1= Rural, 2= Urban; [f]1=Yes, 2=No;
†$F_{(6,1651)}$ =14.75; p<.001, R^2_{Adj}=.047;
‡$F_{(12,326)}$ =5.50; p=.004, R^2_{Adj}=.005;
Note: *Bold indicates significant