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Factors Influencing Crisis Management and Preventive COVID-19 Practices during COVID-19 Pandemic of Primary School Teachers in Aojiang Town, China

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Abstract

COVID-19 pandemic is a public health emergence of international concern that has never been before. Teachers have to manage crisis and prevent COVID-19 infections. Moreover, teachers should be role models of students. The primary school teachers in China have more relationships with community than secondary schools or universities. Hence, the crisis management and preventive COVID-19 practices of primary school teachers are important. The aims of this research are

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to examine crisis management and preventive COVID-19 practices and identify related factors during COVID-19 pandemic in Aojiang town, China. The sample size was calculated, totally 300 primary school teachers from a total of 547 teachers from the 8 primary schools were selected by proportional stratified random sampling. Cross-sectional survey study was employed for the research. The questionnaire was tested for validity by 3 experts with IOC more than 0.5 and reliability by 30 secondary school teachers with Chronbach's alpha of 0.84. Data were analyzed for descriptive statistics, Chi-square test and multiple regression by SPSS. The findings were the high crisis management and preventive COVID-19 practices of teachers. The factors influencing crisis management and preventive COVID-19 practices were perception with knowledge and perception with social support respectively. The suggestions were schools should promote crisis management and preventive COVID-19 practices to make perceptions and increase knowledge. The school, community and family should support teacher for preventive COVID-19 practices.

Keywords: Crisis Management, Prevention, COVID-19, Primary school teacher

Introduction

The coronavirus is a family of viruses which may lead to variou s symptoms such as fever, dyspnea, and pneumonia. The World Health Organization (WHO) called the term 2019 novel coronavirus refer to a coronavirus that infected the lower respiratory tract of pa-

tients with pneumonia in Wuhan, China on 29 December 2019. The WHO declared that the official name of the 2019 novel coronavirus is coronavirus disease (COVID-19) (WHO, 2020). The current reference name for the virus is severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). It was reported that a cluster of patients with pneumonia of unknown cause was linked to a local Huanan South China Seafood Market in Wuhan, Hubei Province, China in December 2019. The WHO confirmed that the outbreak of the coronavirus epidemic was associated with the Huanan South China Seafood Marketplace, but no specific animal association was identified (WHO, 2020). Within 1 month, this virus spread quickly throughout China during the Chinese New Year, a period when there is a high level of human mobility among Chinese people.COVID-19 has been declared as a Public Health Emergency of International Concern by the WHO. Human-to-human transmission of the COVID-19 has posed a major global health threat (Wang, et al., 2020). Since the WHO declared the COVID-19 as a pandemic and hence a public health emergence of international concern, the rate of new infections and deaths has been ever accelerating in many parts of the world. As of August 17, 2020, at least 21,549,706 confirmed cases of COVID-19, including 767,158 deaths, had been reported in 216 countries around the world (WHO, 2020). This pandemic has brought a significant change in life style as well as working environment. Such sudden changes to daily life may have adversely impact peoples' mental health (Dong & Bouey, 2020). When the pandemic of COVID-19 occurs in 2019. Wuhan was locked down

and made various measures, including shutting down work, delaying school opening, closing all kinds of entertainment places, and home segregation. Everyone restricted travel. It is important to know the method to lessen COVID-19 spreading. (Centers for Disease Control and Prevention, 2019).

The crisis of COVID-19 pandemic effects all organizations including schools to manage crisis. Schools must find the ways to no delay the crisis management, but realize that the crisis is coming (Centers for Disease Control and Prevention, 2019). Schools must complete the preparatory work before the crisis, or get rid of the crisis with minimal loss or even some positive results. It is important to know how to prepare for the crisis and how to manage with the crisis. When a crisis happens in school, it threatens school or individuals, resulting in physical and mental destroy, and school cannot function appropriately. They need to respond to cope and create effective remedial measures to protect crises from becoming worse or worst (Jones & George, 2006). The crisis that erupts in schools has both the commonalities and characteristics of normal crises. Schools are densely populated places where students are young, have poor self-protection ability, and have long school activities and the damage often leads to a chain reaction and a greater loss. Therefore, the school teachers must ensure the safety of the campus, strengthen the school's crisis management, take the initiative to prevent and intervene and eliminate potential crises, minimize the losses caused by the crisis, and ensure the normal and orderly teaching and

management in schools. For a long time, China's crisis management is mainly for the intervention system. It is far from being popularized China's research on school crisis management started relatively late. Compared with the foreign research in this area, there is still a big gap. The depth of research is not enough, the research perspective is relatively simple, lacks systematic and empirical research, and most of the research on campus emergency management is a macro research (Liu & Jiang, 2017). According to the study of primary school in Dayao County of Yunnan Province in 2018, the main problems existing in primary school crisis management such as formalism crisis education that leads to lack of crisis consciousness for teachers and students, the crisis consciousness of managers or teachers, lagging behind in crisis consciousness and passive remedies afterwards. From unforeseen natural disasters, about 80% of the deaths can be prevented by preventive measures and emergency treatment (Yunnan's Statistics Bureau, 2018). Hence, primary school teachers should be role models of crisis managements for students. Furthermore, primary schools are more connect to communities or villages than secondary schools, high schools and universities. Primary school teachers have to manage as crisis coordination and human resource coordination in school. They do not only manage crisis in schools but in communities also. The roles of primary school teachers for crisis managements in communities are crisis co-ordination, communication co-ordinations, human resource co-ordination in school and supporting staffs (Barclay, 2004). As for the school emergency management, primary school teachers have

to manage crisis in schools and communities. The research on this topic is limited in China comparing to Europe and America. Thus this research aims to study crisis management of primary school teachers in Ao Jiang Town, Pingyang County, Zhejiang province, China.

As a result of COVID-19 pandemic, most countries, including China, which is seen as a credible global health actor, have been implementing strict controls over social gatherings including schools that would anyhow be regarded as a super spreading event (Zhang, et al., 2020; Wu, et al., 2020). To control COVID-19, proper use of masks, hand hygiene and social distancing have proved extremely useful in most countries. Among other practices, mask wearing is considered the most recommended practice for infection control and breaking the transmission chain of COVID-19 (Goh, et al., 2020). However, a cross-sectional study that investigated Chinese residents from January 27 to February1, found only 73.9% of residents chose the proper type of mask (Zhong, et al., 2020). Another cross-sectional study among primary school students in Wuhan, China which included 9145 students showed only 51.60% of students practiced appropriate mask wearing behavior (Chen, 2020). An observational study involving 1,738 respondents from 190 Chinese cities revealed that high frequency of mask wearing regardless of the presence or absence of symptoms was significantly (Wang, et al., 2020).

Teachers should be role models of preventive COVID-19 practices for students. Furthermore, primary schools are more connect to communities or villages than secondary schools, high schools and

universities. Primary schools in Ao Jiang town, Pingyang county, Zhejiang province, China have to decrease COVID-19 spreading in schools and communities too. Hence, this research was interesting to examine and identify primary school teachers' crisis management and preventive COVID-19 practices and related factors in Ao Jiang Town, Pingyang County, Zhejiang province, China. This research will contribute ability of more fully understanding the main factors that affect teachers' crisis management and preventive COVID-19 practices on schools, and these factors will become the main hand in management practice, give some operability suggestions for crisis management and preventive COVID-19 practice of primary school students in Aojiang town, China, which can play a very good role of reference.

Research Objectives

1. To examine crisis management and preventive COVID-19 practices during COVID-19 pandemic of primary school teachers in Aojiang town, China

2. To analyze relationships of crisis management with preventive COVID-19 practices during COVID-19 pandemic and related factors of primary school teachers in Aojiang town, China

Material and Method

Method

In this cross-sectional survey study, teachers from eight primary schools in Ao Jiang were selected as research subjects, consisting of

547 teachers.

The sample size was calculated by the formula below:

n = N / (1 + Ne2)

n: sample size

N: population

e: sampling error = 0.05

n = 547/ 1 + ((547) * (0.05)2) = 231

Based on Taro Yamane formula with the receivable error 0.05, the result of sample size from calculation was 231 primary school teachers in AoJiang town, China. However, the researcher added up the minimum sample size to 300 for improving confidence level. In order to make every teacher in each school had the same opportunity to be selected as sample, the proportional stratified random sampling method was employed to draw the teachers from each school

Instrument

The questionnaire of primary school teachers' crisis management and preventive COVID-19 practices during COVID-19 pandemic with 18 items covering 4 components (crisis coordinators, communication coordinators, human resource coordinator in school, supporting staffs) and 10 items covering 3 components (infection avoidance, decreasing of COVID-19 spreading, immunity increasing) respectively was developed. Each item comprised of 5 level as: 1= never, 2 = seldom, 3 = sometimes, 4 = often, 5 = very often. The meaning and score range of crisis management and preventive COVID-19 practicing levels were done as: highest, high, moderate. low and lowest. The quality

of instrument was tested. The validity was checked by 3 experts by IOC more than 0.5 in each item. The try-out of 30 teachers was conducted to check reliability. The Chronbach's alphas were 0.81 and 0.84 of this questionnaire.

Data Collection and Analysis

We collected by 5 steps as: 1) obtain formal data collection approval from Mahidol University graduate school. 2) contact the principal of the school and obtain their permission. 3) according to the size of the sample, questionnaires were distributed to school teachers. 4) after distributing the questionnaire for one week, the researchers will re visit the school to collect the returned questionnaires. 5) check whether the questionnaire is complete. The raw scores were calculated to be 1-5 points and divided it into 5 levels. The statistics were descriptive statistics and Chi-square test with multiple linear regression by SPSS for window package.

Results

The scores of crisis management and preventive COVID19 practices from 1.00 - 5.00 were divided into 5 levels (highest, high, moderate, low and lowest). After survey, the results showed that the average crisis management (mean = 3.46, SD. = 0.79) as in table 1 and preventive COVID-19 practices were in high level as in table2 (mean = 3.48, SD. = 0.83). According to descriptive statistics Male teachers were 64.7%. The most age group was in 21 to 40 years old

(79.3%). The majority of teachers were married (82.0%). The highest degree of education was Undergraduate, accounting for 48.7% Some teachers (30.0%)participated in community activities. Most of teachers had planned and trained for crisis management. Most of knowledge, perceptions and social supports of teachers were in low and moderate level.

Table 1. Crisis management levels of primary school teachers during COVID-19 pandemic

Crisis Management	Mean	S.D.	Min	Max	Level
Crisis coordination	3.47	0.82	2.00	5.00	High
Communication coordination	3.47	0.84	2.00	5.00	High
Human resource coordination	3.47	0.83	2.00	5.00	High
Supporting staffs	3.44	0.84	2.00	5.00	High
Overall Crisis Management	**3.46**	**0.79**	**2.00**	**5.00**	**High**

Table 2. Preventive COVID-19 practice levels of primary school teachers during COVID-19 pandemic

Crisis Management	Mean	S.D.	Min	Max	Level
Infection avoidance	3.48	0.81	2.00	5.00	High
COVID-19 spreading decreasing	3.47	0.83	2.00	5.00	High
Immunity increasing	3.44	0.84	2.00	5.00	High
Overall preventive COVID-19 practices	**3.46**	**0.80**	**2.00**	**5.00**	**High**

For factors related to crisis management during COVID-19 pandemic, this study demonstrated that crisis management levels were significant differences by work experience (p-value = 0.036), knowledge (p-value = 0.039), the more knowledge, the better crisis management, perception (p-value = <0.001), same as knowledge, while other factors were not significant as showed in table 3.

Table 3 Crisis Management by related factors of primary school teachers during COVID-19 pandemic

Factors	Crisis management	Crisis Management	Crisis Management	Chi-square or F.E. test
	Moderate & high	Highest	Total	P-value
	No.(%)	No.(%)	No. (%)	
Gender				
Male	165 (85.1)	29 (14.9)	194 (100)	0.502
Female	87 (82.1)	19 (17.9)	106 (100)	
Age groups				
21- 40 years old	149 (84.7)	27(15.3)	176 (100)	0.711
41- 60 years old	103 (83.1)	21 (16.9)	124 (100)	
Marital status				
Married	202 (82.1)	44 (17.9)	246 (100)	0.057
Single and widow	50 (92.6)	4 (7.4)	54 (100)	
Highest education levels				
Technical school or college	116 (83.5)	23 (16.5)	139 (100)	0.810
Bachelor, master, doctor	136 (84.5)	25 (15.5)	161 (100)	
Work experiences				
1 – 5 years	136 (88.3)	18 (11.7)	154 (100)	0.036
More than 5 years	116 (79.5)	30 (20.5)	146 (100)	
Community participation				
Participate	79 (87.8)	11 (12.2)	90 (100)	0.243
Not participate	173 (82.4)	37 (17.6)	210 (100)	
Plan for crisis management				
Have plan	92 (83.6)	18 (16.4)	110 (100)	0.896
No have plan	160 (84.2)	30 (16.8)	190 (100)	

Table 3 Crisis management by related factors of primary school teachers during COVID-19 pandemic (cont.)

Factors	Crisis management	Crisis Management	Crisis Management	Chi-square or F.E. test P-value
	Low & moderate	High	Total	
	No.(%)	No.(%)	No. (%)	
Crisis management training				
Trained	164 (83.2)	33 (16.8)	197 (100)	0.624
Not trained	88 (85.4)	15 (14.6)	103 (100)	
Knowledge				
Low & Moderate level	243 (85.0)	43 (15.0)	286 (100)	0.039
High level	9 (64.3)	5 (35.7)	14 (100)	
Perception				
Low & Moderate level	238 (94.1)	15 (5.9)	253 (100)	< 0.001
High level	14 (29.8)	33 (70.2)	47 (100)	
Social support				
Low & moderate level	188 (85.1)	33 (14.9)	221 (100)	0.399
High level	64 (81.0)	15 (19.0)	79 (100)	

Crisis management during COVID-19 pandemic by related factors of primary school teachers, from significant related factors, the multiple regression by stepwise method was conducted. The regression model to predict crisis management levels of primary school teachers contains the following information:

Adjusted R Square = 0.297. Two independent variables are statistically significant:

1) perception about COVID-19 pandemic ($p < 0.001$),

2) Knowledge about COVID-19 pandemic ($p < 0.001$)

Table 4. Multiple regression of factors influencing crisis management of primary school teachers during COVID-19 pandemic

Model	Standardized coeff. Beta	R	Adjust R^2	T	Sig.
(Constant)				77.072	<0.001
Perception	0.529	0.538	0.287	10.896	<0.001
Knowledge	0.113	0.549	0.297	2.329	0.021

From table 4, the predictive model is as following:

Crisis management level = Constant + 0.529 (perception) + 0.113 (knowledge)

Crisis management level during COVID-19 pandemic of primary school teacher will increase 0.529 unit if factor of perception changes 1 unit when fix other factors. Same as knowledge. This regression model can predict crisis management of primary school teacher 29.7%.

For bivariate analysis, this study demonstrated that preventive COVID-19 practices were significant differences by marital status (p-value = 0.042), work experiences (p = 0.023), community participation (p-value= 0.003), perception (p-value = <0.001), the more perception, the better preventive COVID-19 practices and social support (p-value = 0.009) same as perception, while other factors were not significant as showed in table 5.

Table 5 Preventive COVID-19 practices by related factors of primary school teachers during COVID-19 pandemic

Factors	Prevent COVID-19 Moderate & High No.(%)	Prevent COVID-19 Highest No.(%)	Prevent COVID-19 Total No. (%)	Chi-square test P-value
Gender				
Male	112 (57.7)	82 (42.3)	194 (100)	0.899
Female	62 (58.5)	44 (41.5)	106 (100)	
Age groups				
21- 40 years old	103 (58.5)	73(41.5)	176 (100)	0.571
41- 60 years old	68 (84.8)	56 (45.2)	124 (100)	
Marital status				
Married	136 (55.3)	110 (44.7)	246 (100)	0.042
Single and widow	38 (70.4)	16 (29.6)	54 (100)	
Highest education levels				
Technical school or college	83 (59.7)	56 (40.3)	139 (100)	0.577
Bachelor, master, doctor	91 (56.5)	70 (43.5)	161 (100)	

Table 5 Preventive COVID-19 practices by related factors of primary school teachers during COVID-19 pandemic (cont.)

Factors	Prevent COVID-19 Moderate & High No.(%)	Prevent COVID-19 Highest No.(%)	Prevent COVID-19 Total No. (%)	Chi-square test P-value
Work experiences				
1 – 5 years	99 (64.3)	55 (35.7)	154 (100)	0.023
More than 5 years	75 (51.4)	71 (48.6)	146 (100)	
Community participation				
Participate	64 (71.1)	17 (18.9)	90 (100)	0.033
Not participate	110 (52.4)	100 (47.6)	210 (100)	
Knowledge				
Low & Moderate level	184 (85.0)	102 (15.0)	286 (100)	0.090
High level	7 (50.0)	7 (50.0)	14 (100)	
Perception				
Low & Moderate level	244 (96.4)	9 (3.6)	253 (100)	< 0.001
High level	23 (48.9)	24 (51.1)	47 (100)	
Social support				
Low level	144 (65.2)	77 (34.8)	221 (100)	0.009
High level	39 (49.4)	40 (50.6)	79 (100)	

From significant related factors, the multiple regression by stepwise method was conducted. The regression model contains the following information:

Adjusted R Square = 0.645, Two independent variables are statistically significant:

1) perception about COVID-19 pandemic ($p < 0.001$),

2) Social support ($p < 0.001$)

Table 6. Multiple regression of factors affecting crisis management of primary school teachers

Model	Standardized coeff.	R	Adjust R^2	T	Sig.
	Beta				
(Constant)				2.282	0.005
Perception	0.790	0.802	0.642	22.651	<0.001
Social support	0.070	0.805	0.645	2.001	0.045

From table 6, the predictive model is as following:

Preventive COVID-19 practice levels = Constant + 0.79 (perception) + 0.07 (social support)

Preventive COVID-19 practice levels during COVID-19 pandemic of primary school teacher will increase 0.79 unit if factor of perception changes 1 unit when fix other factors. Same as social support. This regression model can predict Preventive COVID-19 practice levels of primary school teacher 64.5%.

Conclusion

The crisis management and preventive COVID-19 practices of primary school teachers during COVID-19 pandemic in Aojiang town,

China were both in high level. Based on Chi-square test, In the end, there were three and four related factors for crisis management and preventive COVID-19 practices respectively as follow: work experience, knowledge, perception and marital status, community participation, perception, social support respectively. For multivariate analysis, based on stepwise multiple linear regression, there were two influencing factors for both crisis management and preventive COVID-19 practices. The predictive equations were as follow:

Crisis management level = Constant + 0.529 (perception) + 0.113 (knowledge)

This regression model can predict crisis management of primary school teacher 29.7%.

Preventive COVID-19 practice levels = Constant + 0.79 (perception) + 0.07 (social support). This regression model can predict preventive COVID-19 practice levels of primary school teacher 64.5%.

Discussion

It was found that the sample primary school teachers in Aojiang town crisis manage crisis and practice to prevent COVID-19 infection at high level. These findings relevant to the study of Aristovnik (2020) and Espino-Díaz, et al. (2020).

For multivariate analysis, the finding showed that the influencing factors for crisis managements were perception and knowledge, in detail as following:

The finding showed that variation of teachers' crisis managements

by perceptions was statistically significant. It shows us in a pandemic, the perception more positive in the pandemic, the more they are able to respond to COVID-19 in a crisis by cooperating with relevant policies and related preventive measures. In the article of Zhang (2018), the emergency management of campus crisis has not been paid enough attention by the school. Only 12% of the teachers feel that the management of campus crisis has received enough attention in the middle school campus crisis.

The finding showed that variation of teachers' crisis managements by knowledge was statistically significant.It shows us the more knowledge, the better crisis management of primary school teachers in Aojiang town, China. This finding relates to the study of Barclay (2004).

For multivariate analysis, the finding showed that the influencing factors for preventive COVID-19 practices were perception and social support, in detail as follow:

The finding showed that variation of teachers' preventive COVID-19 practices by perceptions was statistically significant. It shows us in a pandemic, the perception more positive in the pandemic, the more they are able to prevent COVID-19, this finding relevant to the study of Szepietowski, et al. (2020).

The finding showed that variation of teachers' preventive COVID-19 practices by social support was statistically significant. It shows us the more social support, the better crisis management of primary school teachers in Aojiang town, China, this finding relevant to the study of Yang, et al. (2020).

Recommendations

1. The schools should be specially organized to promote perception and learning crisis management and preventive COVID-19 practices.

2. Based on the findings, family and community should support teachers to prevent COVID-19.

3. The study was conducted to 8 primary schools in Aojiang town based on the resources and time available. If more townships can be covered, it would be more representative and new findings may be found out.

4. The study was conducted in the primary schools. Further researches are recommended to include other group of sample, such as junior school teachers.

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