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RESPONSE BEHAVIOR, EMOTIONAL AND PSYCHOSOCIAL ADJUSTMENT OF ADULTS TO COVID-19 PANDEMIC HEALTH PROTOCOLS IN WESTERN REGION OF KENYA

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ABSTRACT: *Covid-19 has caused more than 700 deaths with more than 40 thousand infections in Kenya, by end mid October 2020. Undoubtedly, the COVID-19 pandemic contributes to unprecedented spread response behavior and emotional distress among people. The introduction of new health protocols has been a key factor in shaping new norm and psychological behavior, emotional response and adjustment. However, new behavior norms meant to curb spread of COVID-19 has not been without uncertainty. In this cross-sectional study, 251 adults living in Western region of Kenya completed a survey questionnaire to evaluate the response behavior, emotional response and psychosocial adjustment of adults to covid-19 pandemic health protocols in Western region of Kenya. The survey Questionnaires were districted to target adult participants using WhatsApp and e-mail address during the pandemic. Descriptive statistics, independent sample t-test, and one-way ANOVA were employed to analyze data. Three tests were conducted and overall, the findings revealed insignificant difference between categorical variables (gender, level of education and occupation category and dependent variables (response behavior, emotional response and psychosocial adjustment of adults to COVID-19 health protocols. The results revealed statistically insignificant differences between; gender and response behavior (t (249) =.583, p >0.05), occupation categories and psychosocial adjustment to COVID-19 pandemic (*F *(3,247) = .516,* p *>0.05), and level of education and emotional responses to COVID-19 health protocols (F (3, 247) = 1.974, p >0.05).These findings suggest that response behavior response, emotional response and psychosocial adjustment to COVID-19 health protocols do not differ with categorical variables of the adults. The focus therefore should be to work on response behavior, emotional response and psychosocial adjustment indiscriminately in order to help people adapt to the new behavior and norm to curb spread of COVID-19 pandemic.*

KEYWORDS: COVID-19 pandemic, emotional response, Health protocols, psychosocial adjustment and Response behaviour

INTRODUCTION

The onset of coronavirus disease 2019 (COVID-19) has caused devastating negative psychological anxiety and changed people's living conditions (Al-Rabiaah *et al*., 2020). The pandemic is sweeping across the world and is reported to cause widespread psychological concern, fear and stressful reactions among people (Cao *et al*, 2020; Lai *et al*, 2020). The issue facing each and every one of us is how to psychologically manage and react to the COVID -19 situations unfolding so rapidly in our lives, families and communities (Kluge, 2020). COVID-19 is as globalization pandemic has forced nations, communities and families to take up health precaution measures including lockdowns, social isolation, regular handwashing and wearing face masks among

children, adolescents, adults and geriatrics, to reduce spread of the disease. The pandemic's daily informational reporting through various media, including television and social media platforms on its spread and devastation caused, has kept audience anxious and in panic status (Akovljevic *et al*, 2020; Dong & Bouey, 2020). According to Kluge (2020) psychological impacts of the pandemic to older people and those with underlying health conditions poses greater anxiety and stressful feelings since they are perceived much more vulnerable.

Kenya reported the first positive case of COVID-19 on 13th, March 2020 in a 27-year-old Kenyan woman who had travelled from the United States via London, United Kingdom. As at 22 June 2020, Kenya had reported a total of 4, 738 confirmed cases of COVID-19 and 123 deaths (WHO, 2020). With the WHO having introduced a draft of health protocols19 including physical distancing and lock down to curb the spread of COVID-19, Kenya was not left behind. Kenya, like any other nations in the world, adopted WHO COVID-19 health protocols meant to promote health and safety of the persons, their family and their community. In addition, the COVID-19 pandemic health protocols in Kenya lay emphasizes on need for adoption to new norm, behavior and adjustment regardless to ones' level of education, gender and occupation status (Amoth, 2020). The Kenyan Government imposed stringent WHO COVID-19 health measures including national curfew running between 7pm and 5am daily on 27th March 2020 with movements into and out of four counties (Nairobi, Mombasa, Kwale and Kilifi) that are considered hotspots in the country restricted except for essential services. Although measures such as lockdowns and physical distancing are meant to slow down the transmission of COVID-19, such measures are likely to contribute to the rise in psychological health illness. These measures brought new norm and response behavours from people either as approval or disapproval. It is against this background that the current study was conducted to establish the extent of behavior response towards COVID-19 health guidelines in Kenya.

Studies have highlighted that COVID-19 pandemic is a serious public health crisis that has attracted deployment of non-pharmacological intervention (NPI), measures such as various forms of social distancing, pervasive use of personal protective equipment (PPE), such as facemasks, shields, or gloves, and hand washing and disinfection of fomites (Leung *et al.*, 2020). Moreover, additional studies suggest that the disease could persist into 2025, prolonging public health interventions including social distancing and handwashing in place beyond 2022 (Kissler *et al*., 2020). This is possible since the time frame for pharmacological solution is still a mirage, whereas adoption of the new norm among people has proved a challenge.

Prior studies have further demonstrated the impact of infectious disease outbreaks on people's psychological mindset, such as severe acute respiratory syndrome (SARS) in 2003 (Ko, *et al*, 2006; Peng, *et al*, 2020), and the 2009 novel influenza A (HIN1) epidemic (Yeung, 2017; Taha, 2014). These types of epidemics lead the public to experience psychological problems such as post-traumatic stress disorder, psychological distress, depression and anxiety, with potential for causing long-term physiological or mental complications (Shultz, 2015). Other recent studies reveal that psychological problems including stress, anxiety, depression, frustration, uncertainty during COVID-19 outbreak emerge progressively (Duan & Zhu.2020). Similarly, psychological reactions to pandemic like COVID-19 may vary from a panic behavior or collective hysteria to pervasive feelings of hopelessness and desperation (Barbisch *et al*, 2015). Study by Wang *et al* (2020); *Khan et al* (2020) posit that fear related to infection, anxiety, and loneliness has been hypothesized

to impair resilience and personal wellbeing. For instant, social isolation related to restrictions and lockdown measures give rise to feelings of uncertainty resulting hightened anxiety Khan *et al*, (2020), coupled with sensorial deprivation, pervasive loneliness, fatigue and reduced performance (Torales, 2020).

Study by (Rubin & Wessely (2020) in Wuhan, China revealed that during COVID-19 outbreak, mass quarantine raised community behavioural response and adjustment. Further, study in Hong Kong by Leung (2003) noted that a certain level of behavioural response could prompt people to take more preventive measures to check the spread of a pandemic like COVID19. People developed some level of behavioural responses associated with anxiety and fear when facing unknown pandemic, (Taha, 2009). Another study investigated the issue of behavioural response on anxiety to an epidemic among gender. The findings revealed that women appeared to be more prone to anxiety than men, perhaps due to their sensitivity to psychological stress. While a study on psychological behaviour to epidemic like COVID 19 among different age groups found that adult people were more likely to suffer from behavioural responses including state anxiety, depression, and psychological abnormalities as compared to children and older people. The reason for high behavioural response among adults was suggested to be their invaluable socioeconomic responsibility in the society (Moustafa, 2017). Similarly, several studies highlighted that alarming psychological and physiological complications may also evolve among individuals exposed directly or indirectly to COVID-19 pandemic, and thus, demanding prompt care and psychological interventions (Holmes, 2020). A study conducted in China to investigate the mental health outcomes among frontline health care workers engaged diagnosis, treatment, and care of COVID-19 patients found women nurses as compared to their men counterparts to exhibit and women in particular experience some psychological distress such as depression, anxiety and insomnia (Lai, 2020).

Other studies have distinguished different motives for people behavior to approve or disapprove of social norms (Cialdini *et al*, 2004; Wood, 2000). Although people are influenced by norms, their perceptions are often inaccurate (Miller & Prentice, 1996). For example, people can underestimate health-promoting behaviours, for example, hand washing Dickie (2018), and overestimate unhealthy behaviors like social gathering (Berkowitz, 2005). Adjusting to such behaviours can be achieved through social networks such as public messages, in-group models (Christakis & Fowler, 2013; Kim *et al*, 2015). Another way to leverage on adjustment to new norms require use of nudges and normative information to complement regulatory, legal and other imposed policies like COVID-19 health guidelines (Halpern, 2015; Thaler & Sunstein, 2008). Sparkman &Walton (2017) assert that people are highly reactive to the choices made by others, especially significant others, to have a positive impact on behavior adjustment.

Mustafa (2020) in a study on psychological and physiological responses in population exposed to COVID-2019 found psychological stressor in a form of emotional, behavioral, cognitive, and belief responses to lead to physiological change or reactivity. Findings further revealed that physiological factor is significantly and positively correlated (at 1% level) with all psychological factors (Emotional, Behavioural, Cognitive, and belief). This explains that COVID-19 as a stressor by nature may work as a challenge or stimulus threatening the internal balances or homeostasis of a physiological system. Additional studies among workers by ILO (2020) hypothesize that COVID-19 pandemic has created psychological health issues such as fear of being infected, losing

one's job, seeing revenues reduced and experiencing lower quality of life and social isolation. Another study among in China found that sleep quality did not improve among front-line health workers and the general public during early stages of the COVID-19 epidemic (Yuan *et al*, 2020). Inaddition, study in UK revealed general somatic symptoms, and in particular gastrointestinal and fatigue symptoms (Shevlinet et *al*, 2020). This may imply that as the pandemic progression elevates the behavior change, the somatic symptoms also may escalate. Indeed, psychological stressors may trigger physiological responses in human beings, causing a wide range of physiological illnesses and symptoms (Kataoka, 2014; Oka, 2015; Xiang *etal.*, 2020).

Cultural factors may impact on the gender balance of reported COVID-19 pandemic. For women may be protected by customs relating to traditional clothing or placed at less risk of contracting infection through distancing from (Olav and Andrew, 2020). In many societies, men spend more time away from home than women. For this reason, males typically face greater exposure to infectious agents outside the home whereas females tend to face greater exposure inside the home. However, the consequences of these different gender-related exposure patterns are complex, and differ for different infectious agents (WHO, 2007). In general, COVID 19 outbreak in Wuhan, China, showed to possess a modest advantage with regard to response behaviour (Lauren, 2020).

In Kenya, a study by Austraian *et al* (2020) on COVID-19 related knowledge, attitudes, practices and needs of households in informal settlements in Nairobi, found handwashing and using hand sanitizer were known prevention methods, though not having a personal water source (37%) and hand sanitizer being too expensive (53%) were barriers. Social distancing measures were challenging as (61%) indicated that this would risk income. The study concluded that knowledge of COVID-19 is high, though behavior change was still a challenge. Therefore, need for strategies to facilitate social distancing and handwashing. The current study focused on the extent of behavior response towards COVID-19 health guidelines in Western region, Kenya.

METHODS

Objectives of the Study

The objectives of this study were to:
Determine whether behavioural responses to COVID-19 health protocols differ significantly between genders among adults
Establish whether psychosocial adjustments to COVID-19 health protocols differ significantly between occupation categories among adults
Find out whether emotional responses to COVID-19 health protocols differ significantly between education levels among adults

Research Design

Cross-sectional study was conducted to check associations regarding psychological response behavior and adjustment of the adult population to COVID-19 pandemic health protocols in Kenya. A cross-sectional study is a type of research design in which variables are investigated without undue influence on them, and data collected from many different individuals at a single point in time (Mertler, 2019). Cross-sectional research design was found suitable for this study since the researcher intended to examine the prevalence of explanatory and outcome variables at a cheaper and less-time consuming moment. The purpose of the study was to find out

psychological response behavior and adjustment of the Kenyan adult population to COVID-19 health protocols issued by ministry of health from time to time.

Participants

The focus of this study was to involve adult population living in western region of Kenya, living largely in rural areas. The participants' demographic characteristics considered consisted of levels of education, occupation and gender. It was assumed that the selected participants informed about COVID-19 pandemic, health protocols, procedures, and systems needed to be in place to deal with the pandemic impacting negatively on mankind globally. Therefore, the participants included the adult population living largely in the rural environment from the western region of Kenya in Kakamega, Siaya, Bungoma and Busia counties. The participants in this study consisted of a total of 251 adults, 132(52.6%) male and 119(47.4%) female. With regard to education levels out of 251, 23(9.2%) reached primary, 71(28.3%) secondary while 156(62.2%) secondary education. In terms of occupation 46(18.3%) were self-employed, 38(15.1%) were private sector employees, 75(29.9%) employed in the public service while the remainder 92(36.7%) were not employed (see Table 1).

Table 1. Variable Characteristics of Participants

Variable Characteristic	Frequency	Percentage
Gender		
Male	132	52.6
Female	119	47.4
Total	251	100
Education level		
Primary	23	9.2
Secondary	71	28.3
University	156	62.2
Total	251	100
Occupation		
Self-employed	46	18.3
Private sector	38	15.1
Public Service	75	29.9
Not employed	92	36.7
Total	251	100

Procedures

Self-report questionnaire was prepared by the researcher and distributed to the target population via WhatsApp and email networks. Participants were previously informed about the aims of the study, thus gave informed consent to participate. The survey was anonymous and treated accordingly to ethical considerations for research in Kenya. At the end of the survey, participants were debriefed and provided with information on the potential benefits of the study. Reliability of the instrument to determine internal consistency was assessed using Cronbach's α. Analysis of reliability was computed using SPSS- version 22.0. Cronbach's alpha for the questionnaire reached was 0.848, indicating positive reliability and validity of the instrument. This was found ideal for internal consistency of the research instrument.

Measures

For this study, self-report questionnaire was compiled and administered to participants to assess the psychological behavioural response and adjustment of adult population to COVID 19 health protocols. Behavioural response in this study entailed the actions and interactions of the person to try to maintain a balance with the new norm described in COVID-19 health protocols in order to curb spread and infection of the disease. The survey instrument consisted of two parts. The first was demographic data of the participants (gender, education level and occupation). The second part of the survey consisted of three main dimensions; the adjustment behaviour (12 items), emotional responses (8 items) and behavioral responses (12 items) towards new set of COVID19 health protocols. Each question score ranged from 1-5 on a Likert scale, where higher scores on this scale represent greater response related to the higher impact of COVID-19 health protocols the among the adult population.

Statistical Analysis

In this study, descriptive statistics, correlation, and the one-way analysis of variance (ANOVA) were employed. Descriptive statistics involved frequencies and percentages for categorical variables. One way ANOVA was used to determine whether there are any statistically significant differences between the means of two or more independent groups. In this study the differences in psychological behavior responses and adjustment were tested against demographic characteristics of adults with regard to response to COVID- 19 health protocols. Since there were more than two groups in the study design, a post hoc test was done to determine which of these groups differed from each other. Data was analyzed using SPSS version 22.0.

The statistical hypotheses tested in this study at alpha (α) set at 0.05. The analysis was guided by the following three tests;

Test 1: Does behavioural responses to COVID-19 health protocols significantly differ between gender among adults.

Test 2: Does psychosocial adjustment to COVID-19 health protocols differ between occupation categories among adults?

Test 3: Does emotional responses to COVID-19 health protocols significantly differ between education levels among adults?

RESULTS

For Test 1 Independent Samples *t* Test was run to compare the means of two independent groups (male and female adults) in order to determine whether there is statistical evidence that the associated population means are significantly with regard to behavioural responses on COVID-19 health protocols issued in Kenya. A null hypothesis tested stated that behavioural responses on COVID-19 health protocols do not significantly differ between male and female adults. The Independent Samples *t* Test was employed because dependent variable was continuous, independent variable is categorical and both groups had the similar variance, data was randomly sampled from the target population and there was approximately normal distribution of the dependent variable for each group. The results are given in Table 2.

Table2. Gender and Behavioural Reponses to COVID-19 Health Protocols

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Behviour	Equal variances assumed	.075	.784	.583	249	.560	.51286	.87909	-1.21854	2.24426
	Equal variances not assumed			.584	246.587	.560	.51286	.87885	-1.21815	2.24387

From Table 2 an independent-samples t-test was conducted to compare behavioural responses to COVID-19 health protocols between male and female adults during COVID- 19 pandemic. The results revealed no significant differences in the scores for Male (M=42.15, SD=6.97) and Female (M=41.64, SD=6.94) behavior responses; t (249) =.583, p = 0.05. These results suggest that COVID-19 health protocols have same effect on behavior responses of male and female adults in Western region of Kenya. Specifically, the results suggest that when male and female adults are exposed to COVID-19 health protocols their behavior responses are affected less in the same way. However, it should be noted that on average Male (M=42.15 SD= 6.97) behavioural response is higher compared to Female (M=41.64 SD=6.94). Perhaps this explains why more male than female are prone to attack by COVID 19- pandemic than their female counterparts. The finding concurs with assertion by Lauren (2020) that in many societies, men spend more time away from home than women. For this reason, males typically face greater exposure to infectious agents outside the home whereas females tend to face greater exposure inside the home.

In Test 2: Do different occupation categories report a significantly different adjustment to COVID-19 health protocols? The null hypothesis was tested stated that adjustment to COVID-19 health protocols does not significantly differ between various occupation categories among adults. One way ANOVA was used to test the null hypothesis since the data for dependent variable were continuous , independent variable consisted of more than two categorical groups, there was independent observations between the groups themselves, data was approximately normally distributed, there was homogeneity of variances and there were no significant outliers. The results are given in Table 3.

Table 3.Occupation and Psychological Adjustment to COVID-19 Health Protocols

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	154.659	3	51.553	.516	.671
Within Groups	24659.883	247	99.838		
Total	24814.542	250			

From Table 3, a one-way ANOVA was conducted to compare psychological adjustment to COVID-19 pandemic among adults engaged in various occupations. The findings revealed no statistically significant difference between adult occupation categories and psychosocial adjustment to COVID-19 pandemic (F (3,247) = .516, p = .671). This result implies that regardless to one's occupation (self. Company public or not employed) experienced similar psychological adjustment to COVID-19 health protocols among adults in Western region of Kenya. However, it should be noted that on average Self-employed (M=39.9783 SD= 7.99302) as compared to other occupations differed in psychological adjustment with regard to COVID-19 health protocols. Company (M=379847 SD= 9.99402) public service (M=37.9867 SD= 11.03593) not employed (M=38.2391 SD= 9.96284). Perhaps this explains why more male than female are prone to attack by COVID- 19 pandemic than their female counterparts. This is supported by the argument by WHO (2020) that behavioural response among men exposes them to greater risk of contract infectious disease such as COVID-19. Men typically work away from home thus makes them more vulnerable to infectious pandemic (Lauren,2020).

Test 3, one way ANOVA was employed to establish whether emotional responses significantly differed between various levels of education of adults with regard to COVID-19 health protocols. A null hypothesis was tested that stated emotional responses on COVID-19 health protocols does not significantly differ between various levels of education of adults. The results are given in Table 4.

Table 4. Education Levels and Emotional Responses to COVID-19 Health Protocols

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	297.476	3	99.159	1.974	.118
Within Groups	12410.436	247	50.245		
Total	12707.912	250			

From Table 4, participants' emotional response did not differ significantly between the primary, secondary and university levels of education as regards COVID-19 health protocols F (3, 247) = 1.974, p-value = .118.. From the findings of the analysis in Table 4, hypothesis that was tested emotional response to COVID-19 health protocols does not significantly differ between various educational levels among adults was not rejected at 0.05 level of significance. The findings suggest that emotional responses related to covid19 health protocols did not affect adults differently based on the level of education in western region of Kenya. However, it's worth noting that adults with secondary level of education on average showed higher psychological emotional response to

COVID 19 health protocols (M=23.8451 SD=7.43284 as compared to Primary (M=22.3478 SD=7.00395) and University (M= 21.8846 SD=6.93933).

DISCUSSIONS

From Test 1, the study results confirmed COVID -19 health protocols do not significantly bring about different response behavior among male and female adults during the COVID 19 pandemic.. This finding differ with the study of Wang *et al* (2020); Khan *et al* (2020), who attested that fear related to infection, anxiety, and loneliness has been hypothesized to impair resilience and personal wellbeing of the people affected. For instant, social isolation related to restrictions and lockdown measures give rise to feelings of uncertainty resulting heightened anxiety behavior. In contrast with the present study, in which women were found to behave the same way like male counterparts, Lauren (2020) found women to have a modest advantage with regard to response behavior to COVID-19 outbreak in Wuhan, China.

The findings in Test 2 revealed no statistically significant difference between adult occupation categories and psychosocial adjustment to COVID-19 pandemic (F (3,247) = .516, p = .671). This result implies that regardless to one's occupation psychological adjustment to COVID-19 health protocols among adults does not differ. This finding is in tandem the work of ILO (2020) who asserted that COVID-19 as a stressor by nature may challenge or threaten the internal balances or homeostasis and that the pandemic create psychological health issues such as fear of losing one's job (Yuan *et al*, 2020).

The finding in Test 3 suggest that emotional responses related to covid19 health protocols did not affect adults differently based on the level of education in western region of Kenya. This finding concur with UNESCO's (2020) assertion that COVID 19 pandemic affected education at all levels resulting to lockdown of schools, colleges and universities, thus leading to dramatic change with distinctive rise of e-learning and or increased adoption in education technology.

Strengths and Limitations

Strengths of the current study consist of a broad and large sample of adult participants living in western region of Kenya who responded to a validated questionnaire. More importantly, a set of control variables such as gender, level of education and occupation were included in the study to determine respond to COVID- 19 pandemic. However certain, limitations were underscored in this study. First, since the questionnaire was self-reported through social media (whatsApp and e-mails, there was a possibility of an information bias and also selection bias (i.e. due to the sampling method that might have included respondents outside adult population in general). Further, of all selected to participate in the survey, 99 out of 350 individuals (28.3%) declined to return questionnaire. In this study, no characteristic was observed to be substantially different compared to people who agreed to participate (i.e. gender, education level and occupation). Nevertheless, there is a possibility that those who declined to return the questionnaire may have had either lower or bear minimum influence on the current outcome of the current study. Last, due to the cross-sectional design, the present study does not allow inferring causal conclusions; thus, randomized controlled trials are further necessary to confirm these findings.

CONCLUSION AND RECOMMENDATIONS

The current study attempted to fill the knowledge gap on response behavior, emotional and psychosocial adjustment of adults to COVID-19 pandemic health protocols. The response to COVID 19 health protocols in a form of, response behavioral, emotional response and psychosocial adjustment can lead to change towards COVID 19 pandemic. This explains that COVID-19 health protocols as a new normal is a challenge or stimulus threatening the internal balances of a psychosocial system. The findings of this work contribute to the knowledge base by providing indication that the response behavior, emotional and psychosocial adjustment of people due to the COVID-19 pandemic do not differ by gender, level of education and one's occupation type. This literature is essential since psychological and social preparedness of this pandemic carries global importance. Failure to psychologically adjust to COVID 19 health protocols could further escalate the outbreak, instigating further psychological distress. The COVID-19 pandemic has clearly shown us how a "virus" can negatively impact our lives even in the 21st century and simultaneously made us realize that the greatest assets of mankind is psychological, emotional and social health. The focus, therefore, should be to work response behavior, emotional response and psychosocial adjustment indiscriminately in order to help them adapt to the new behavior and norm to curb spread of COVID-19 pandemic.

References

Akovljevic M, Bjedov S, Jaksic N, Jakovljevic I (2020). COVID-19 Pandemia and Public and Global Mental Health from the Perspective of Global Health Security. Psychiatry Danub 32: 6-14.

Al-Rabiaah A, Temsah, M.H., Al-Eyadhy, A.A., Hasan, G.M., Al-Zamil, F., Al-Subaie, S., et al (2020). Middle East respiratory syndrome-corona virus (MERS-CoV) associated stress among medical students at a university teaching hospital in Saudi Arabia. *J Infect Public Health*. 2020. doi: 10.1016/j.jiph.2020.01.005. [PubMed: 32001194].

Amoth, P (2020). Psychological First Aid Guide for COVID-19 Response in Kenya: Ministry of Health, Kenya

Austraian K, Pinchoff, J et al (2020). COVID-19 related knowledge, attitudes, practices and needs of households in informal settlements in Nairobi, Kenya. Bulletin of the World Health Organization *Published online: 20 April 2020)*

Barbisch D, Koenig KL, Shih FY.(2015). Is there a case for quarantine? Perspectives from to Ebola. Disaster Med Public Health Prep 2015; 9:547–53.

Berkowitz, A.D. (2005). An overview of the social norms approach. in *Changing the Culture of College Drinking: A Socially Situated Health Communication Campaign* (eds. Stewart, L. & Lederman, L. C.) 193–214 (Hampton Press, 2005).

Cao W, Fang Z, Hou G, Han M, Xu X, et al. (2020). The psychological impact of the COVID-19 epidemic on college students in China. Psychiatry Research: 287: 112934.

Christakis, N. A. & Fowler, J. H.(2013). Social contagion theory: examining dynamic social networks and human behavior. *Stat. Med.* 32,556–577 (2013).

Cialdini, R. B. & Goldstein, N. J.(2004). Social influence: compliance and conformity. *Annu. Rev. Psychol.* 55, 591–621 (2004).

Dickie, R., Rasmussen, S., Cain, R., Williams, L. & MacKay, W. (2018).The effects of perceived social norms on handwashing behaviour in students. *Psychol. Health Med.* 23, 154–159 (2018).

NCIRD.(2019). Division of Viral Diseases.Marrenga:https://www.cdc.gov/coronavirus/2019-ncov/daily-life-coping/managing-stress-anxiety.html

Dong L, Bouey J (2020) Public mental health crisis during COVID-19 pandemic, China. Emerg Infect Dis 26

Duan L, Zhu G.(2020). Psychological interventions for people affected by the COVID-19 epidemic. Lancet Psychiatry 2020; 7:300–2.

Fiorillo A, Gorwood P (2020). The consequences of the COVID-19 pandemic on mental health and implications for clinical practice. European Psychiatry 63 :e32. from to Ebola. Disaster Med. Public Health Prep. 9, 547–553.

Halpern, D. (2015). *Inside the Nudge Unit: How Small Changes Can Make a Big Difference* (Random House, 2015).

Holmes EA, O'Connor RC, Perry VH, Tracey I, Wessely S, et al. (2020). Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science. The Lancet Psychiatry 7(6): 547- 560.

International Labour Organization (2020).Managing work-related psychosocial risks during theCOVID-19 pandemic: Geneva: ILO 2020.

Kataoka, N., Hioki H, Kaneko T, Nakamura K (2014). Psychological stress activates a dorsomedial hypothalamus-medullary raphe circuit driving brown adipose tissue thermogenesis and hyperthermia. Cell Metabolism 20(2): 346–358.

Khan S, Siddique R, Li H, Ali A, Shereen MA, Bashir N, et al.(2020). Impact of coronavirus outbreak on psychological health. J Glob Health 2020; 10:010331.

Kim, D. A. et al.(2015). Social network targeting to maximise population behaviour change: a cluster randomized controlled trial. *Lancet* 386, 145–153 (2015).

Kissler, S. M., Tedijanto, C., Goldstein, E., Grad, Y. H., and Lipsitch, M. (2020). Projecting the transmission dynamics of SARS-CoV-2 through the postpandemic period. *Science* 368, 860–868. doi: 10.1126/science.abb5793

Kluge, H.H.(2020)Mental health and psychological resilience during the COVID-19 pandemic. World health organization Regional office for Europe

Ko CH, Yen CF, Yen JY, Yang MJ.(2006). Psychosocial impact among the public of the severe acute respiratory syndrome epidemic in Taiwan. Psychiat Clin Neuros. 2006; 60:397–403.

Lai CC, Shih TP, Ko WC, Tang HJ, Hsueh PR (2020). Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and corona virus disease-2019 (COVID-19): the epidemic and the challenges. International Journal of Antimicrobial Agents 55(3): 105924.

Lauren, W. (2020). Sex- and Gender-specific Observations and Implications for COVID-19 The western journal of emergency medicine

Leung GM, Lam TH, Ho LM, Ho SY, Chan BHY, Wong IOL, et al.(2003). The impact of community psychological responses on outbreak control for severe acute respiratory syndrome in Hong Kong. J Epidemiol Community Health. 2003; 57(11):857–63. https://doi.org/10.1136/jech.57.11.857

Leung, K., Wu, J. T., Liu, D., and Leung, G. M. (2020). *First-wave COVID-19 transmissibility and severity in China outside Hubei after control measures, and second-wave scenario* planning: a modeling impact assessment. *Lancet* 395, 1382–1393. doi: 10.1016/S0140-6736(20)30746-7

Maunder R, Hunter J, Vicent L, Bennett J, Peladeau N, Leszcz M, et al.(2003). The immediate psychological and occupational impact of the 2003 SARS outbreak in a teaching hospital. CMAJ2003; 168:1245–51.

Mertler, C.A.(2019). *Introduction to educational research* 2nd ed. Los Angeles: SAGE Publications

Miller, D.T. & Prentice, D.A.(1996). The construction of social norms and standards. in *Social Psychology: Handbook of Basic Principles* 799–829 (Guilford Press, 1996).

Moustafa AA, Tindle R, Frydecka D, Misiak B.(2017). Impulsivity and its relationship with anxiety, depressionandstress.ComprPsychiatry.2017;74:1739.https://doi.org/10.1016/j.comppsych.2017.01.013.

Mustafa A.B.(2020) The Psychological and Physiological Responses in Population Exposed to COVID-2019 Pandemic *Current Trends on Biostatistics &Biometrics DOI: 10.32474/CTBB.2020.03.000155*

NCIRD, (2020). Coronavirus Disease 2019. National Center for Immunization and Respiratory

Oka, T (2015) Psychogenic fever: how psychological stress affects body temperature in the clinical population. Temperature 2(3): 368–378.

Olav T. M. & Andrew W. T. (2020) COVID-19: Cultural Predictors of Gender Differences in Global Prevalence Patterns. Frontiers in public health Paris, France

Peng EYC, Lee MB, Tsai ST, Yang CC, Morisky DE, Tsai LT, et al.(2021). Population-based post-crisis psychological distress: an example from the SARS outbreak in Taiwan. J Formos Med Assoc. 2010;109: 524–32

Rubin, G.J., Wessely, S., 2020. Coronavirus: the psychological effects of quarantining city.TheBMJOpinion.https://blogs.bmj.com/bmj/2020/01/24/coronavirusthepsychological- effects-of-quarantining-a-city/.

Shevlin M, Nolan E,Owczarek M, McBride O, Murphy J, et al. (2020). COVID-19-related anxiety predicts somatic symptoms in the UK population. British Journal of Health Psychology 10:1111.

Shultz JM, Baingana F, Neria Y.(2015) The 2014 Ebola outbreak and mental health: current status and recommended response. JAMA. 2015;313:567–8.

Sparkman, G. & Walton, G. M. (2017). Dynamic norms promote sustainable behavior, even if it is counter normative. *Psychol. Sci.* 28, 1663–1674 (2017).

Taha S, Matheson K, Cronin T, Anisman H.(2009).Intolerance of uncertainty, appraisals, coping, and anxiety: the case of the 2009 H1N1 pandemic. Br J Health Psychol. 2014;19(3):592–605. https://doi.org/10.1111/bjhp.12058.

Taha SA, Matheson K, Anisman H.(2014) H1N1 was not all that scary: uncertainty and stressor appraisals predict anxiety related to a coming viral threat. Stress Health. 2014; 30:149–57.

Thaler, R.H. & Sunstein, C.R. *(2008). Improving Decisions About Health, Wealth, and Happiness*. (Yale University Press, 2008).

Torales J, O'Higgins M, Castaldelli-Maia JM, Ventriglio A.(2020). The outbreak of COVID-19 coronavirus and its impact on global mental health. Int J Soc Psychiatry 2020; 66:317–320.

UNESCO (2020). COVID-19 Impact on Education Data. COVID-19 Education Disruption and Response. The United Nations Educational, Scientific and Cultural Organization, UNESCO.

Wang J, Wang JX, Yang GS.(2020). The Psychological Impact of COVID-19 on Chinese Individuals. Yonsei Med J 2020; 61:438–40.

WHO (2007) Addressing sex and gender in epidemic-prone infectious diseases. WHO Library Cataloguing-in-Publication Data

Wood, W. (2000). Attitude change: persuasion and social influence. *Annu. Rev. Psychol.* 51, 539–570 (2000).

World Health Organization (WHO). Coronavirus Disease 2019 (COVID-19) Situation Report – 154. 2020. [Accessed 9th June 2020]. [Link]

Xiang YT, Yang Y, Li W, Zhang L, Zhang Q, (2020). Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed. The Lancet Psychiatry 7(3): 228–229.

Yeung NCY, Lau JTF, Choi KC, Griffiths S.(2017). Population responses during the pandemic phase of the influenza a(H1N1)pdm09 epidemic, Hong Kong. China Emerg Infect Dis. 2017; 23:813–5.

Yuan S, Liao Z, Huang H, Jiang B, Zhang X, et al. (2020). Comparison of the indicators of psychological stress in the population of Hubei Province and non-endemic provinces in China during two weeks during the coronavirus disease 2019 (COVID-19) outbreak in February 2020. Medical Science Monitor: International Medical Journal of Experimental and Clinical Research 26: e923767.