Original Article



Perceptions of COVID-19 Disease Among Patients in Isolation Ward

S H Waqar¹, Isbah Rashid², Muhammad Raheem³, Nasim Akhtar⁴, Minhaj us Siraj⁵

¹Professor of Surgery, Department of General Surgery, ^{2,3}Postgraduate Resident, Department of General Surgery, ⁴Assistant Professor Infectious Diseases, In-charge Isolation ward (Pakistan Institute of Medical Sciences, Shaheed Zulfiqar Ali Bhutto Medical University, Islamabad) ⁵Joint Executive Director, Pakistan Institute of Medical Sciences, Islamabad

Author`s Contribution

^{1,2,3} Substantial contributions to the conception or design of the work

^{1,2,4}The acquisition, analysis, or interpretation of data for the work ^{2,3,5}Data Collection and analysis ^{1,4,5}Final approval of the version to be published

Funding Source: None Conflict of Interest: None Received: Sept 29, 2020 Accepted: Feb 08, 2021

Address of Correspondent

Dr Isbah Rashid
Postgraduate Resident,
Department of General Surgery,
Pakistan Institute of Medical
Sciences, SZABMU
Email: dr.isbah@msn.com

ABSTRACT

Objective: To explore the perceptions about COVID – 19 disease among patients admitted in Isolation ward and to improve management ideas.

Methodology: This qualitative cross sectional interview based study was conducted at Isolation ward, Pakistan Institute of Medical Sciences Islamabad from April to June 2020. Patients who were reported positive for SARS COV-2 through nasopharyngeal or oropharyngeal swabs and were admitted for at least one day in isolation ward, were included in the study. Patients who were too ill to talk for the interview and those who could not survive the disease were excluded. After taking informed consent and following the standard operating procedures (SOPs) of Corona Isolation ward; data was obtained by conducting in depth interviews arranged as per patients' convenience on mobile calls. Data was analyzed using Narrative Analysis. Themes were delineated and organized to groups for understanding.

Results: Twenty two patients participated with the mean age of 34.64±7.26 years. Majority of the patients had anxiety and fear for the COVID-19 disease however also were hopeful to face it. The delineated themes were anxiety & depression, fear, hopefulness & moving forward, health facilities & related issues, living in isolation and physiological disturbances like sleep, appetite, smoking or addiction, exercise.

Conclusion: Covid-19 patients depict mixed perceptions while admitted in Isolation ward and this provide us an insight to this catastrophic illness. Their experiences help the health authorities to address this issue.

Keywords: Anxiety, COVID-19, Fear, Healthcare, Isolation.

Cite this article as: Waqar SH, Rashid I, Raheem M, Akhtar N, Siraj MU. Perceptions of COVID-19 Disease Among Patients in Isolation Ward. Ann Pak Inst Med Sci. 2021; 17(1):17-22.doi.10.48036/apims.v17i1.497

Introduction

The Novel Corona Virus outbreak has affected about a million people worldwide. Amongst the affected, an average of a hundred thousand could not survive the disastrous pandemic. It is an emerging virulent organism, with no specific available treatment and pathophysiology still unknown.¹⁻³ The exponential rate of spread of this virus poses a threat. The world is chasing refuge by social distancing, to prevent its spread and by increasing quarantine facilities, to spot the affected carriers and isolate them. In the isolation, primarily the patients recover but spend time in seclusion with supportive treatment as and when required.

The pandemic has caused an increase in the general population's anxiety and stress level, particularly among people with the disease.⁴ Since this is a new disease, our medical knowledge is deficient and health care providers fail to answer all the queries of the patients and their families. The patients have a propensity to have a low mood when they could not see their loved ones for long and when they fall hopeless in despair, depression may develop. In the Isolation, thoughts of fear and tension may prevail to raise the anxiety level. The rising morbidity and mortality has led to Corophobia, a new global phobia of the virulent pathogen.⁵ Many patients still may be motivated and aim to cope up with their life goals.

Amongst the ones affected the elderly, the immunecompromised and the ones with intrinsic lung diseases, and a few related groups like with existing Psychiatric ailments are liable to more damage and they should be paid special attention to. Worldwide research has been initiated to figure out the behavioral attributes of people, ranging from the general population, caregivers, health care professionals, the quarantined, and the isolated. Little literature is currently available and sample sizes are less but still important to present logically and suggest coping strategies and management plans. The studies are relating the natural course of the disease, its transmission, and peaks of propagation with perverse perceptions of the inhabitants. 7-10 While the new pandemic is unique in many ways, it is important to seek knowledge from a significant body of literature on the psychological and behavioral health responses and consequences of disaster events.¹⁰ Although similar studies have not yet been published but the literature still has aided us to substantiate an idea of how a COVID patient may be derived by his thoughts, during his stay in the isolation.¹¹ Related researches on different study groups from the population have analogous themes in general.^{7,8} Research has been conducted since the onset of this virus, very few have explored the perception of this disease by the patient. Patients' feelings with their experience with COVID-19 are important for health professionals and others to view the disease from a caring perspective and not from a purely factual perspective. As little is known about patient's behavior in the isolation, we carried out a qualitative study to explore the patients' perceptions about COVID - 19 and to improve management ideas.

Methodology

This qualitative cross sectional interview based study was conducted at the Isolation ward, Pakistan Institute of Medical Sciences Islamabad from April to June 2020. Patients were selected using non- probability convenience sampling after verbal informed consent. Ethical approval of the study was taken from the hospital ethical committee. All patients whose tests were reported positive for SARS COV-2 through nasopharyngeal or oropharyngeal swabs and were admitted for at least one day in isolation ward PIMS Islamabad were included in the study. Patients who were too ill to talk for the interview and those who could not survive the disease were excluded from the study.

Patients' demographics and clinical data were taken from the clinical records. Interviews were arranged as per patients' convenience on mobile calls. Data was obtained by conducting in Depth interviews based on a semi-structured questionnaire. The objectives of the research were first made clear to the participants and then verbal consent was taken. Any of the participants not willing to reveal their identities were assured that their responses would remain anonymous. Open-ended questions were asked to get information about patients' perceptions of the COVID 19 disease and responses were recorded. Later these responses were transcribed to keep a record of their perceptions. This data was subjected to analysis for a better understanding of themes of single patient perception and the whole sample. All data was analyzed using Narrative Analysis and themes were delineated and organized to groups for understanding.

Results

A total of 22 patients participated in the study. Mean age of the patients was 34.64 ± 7.26 years with a male to female ratio of 12:10. Three (13.6%) patients were elder than 50 years of age. There demographic characteristics are shown in Table I.

Various themes were generated on individual basis, however, these themes overlapped when considering the group, with common notions and perceptions in various

Table I: Demographics of the Participants (n=22)				
Characteristics	Frequency	Percentage		
Gender				
Male	12	54.5		
Female	10	45.5		
Literacy				
Illiterate	03	13.6		
Primary	02	9.1		
Secondary	04	18.2		
Higher secondary	07	31.8		
Graduate and above	06	27.3		
Marital status				
Bachelor	06	27.3		
Married	17	68.18		
Divorced/Separated	01	4.5		
Occupation				
Self-employed	04	18.2		
Private job	04	18.2		
Government employee	05	22.7		
Jobless	01	4.5		
Co-morbid				
Diabetes Mellitus	01	4.5		
Hypertension	03	13.6		
Asthma	02	9.1		
Travel history				
Abroad	05	22.7		
Intercity	04	18.2		
Smoking				
Yes	04	18.2		
No	18	81.8		

combinations. We have seen how isolation and the symptoms of the disease combined with its infective nature did outcast its effects over the sufferers. Our Delineated Themes remained: 1. Anxiety & depression, 2. Fear 3. Hopefulness & moving forward 4. Health facilities & related issues 5. Living in isolation 6. Physiological disturbances like sleep, appetite, smoking or addiction, exercise.

Anxiety was common especially in the beginning, and slowly wearing off. In others, this anxiety was superadded with depression. Depression was seen primarily in middle aged females. Young males were seen with the most positive behavior and acceptance of the diagnosis. Initially, the common perception was 'denial', at instances due to the hovering perception of not being vulnerable themselves, and at other times a 'doubt' on the testing facility, especially when the patients were asymptomatic.

We could sense fear in our patients, even when they were explaining hope. A middle-aged lady narrated her anxiety out of fear when on her first day of admission she witnessed that another patient had died of COVID at the isolation and his family was in demise, however, now she herself is recovering and has high hopes. Many patients were fearful because they had to go through a combination of fake and genuine news. Patients whose other family members were affected especially children, were worried. The ones with loved ones admitted in health care facilities, were also afraid of losing them.

Positivity was always there, whether we were communicating with a depressed patient; we assessed how they were already being fed regularly by the health care professionals for the arousal of hopefulness. Many patients explained how they were coping with their negativity and depression. An important component always remained their steadfastness to the religion, offering prayers, recitation of holy manuscript and strong beliefs. We clearly found how they were lingering on with religious beliefs to spend their time in the isolation cutting down fear anxiety and depression, finding hope and aspiration. Many of them were pinning their hopes on by planning about their life goals and ambitions.

The health care facility, as a whole, was greatly appreciated by the patients; however various quarantine facilities were criticized for lacking basic facilities by the patients who initially inhabited them. The staff at the isolation ward was appreciated for their punctuality and care for the patients. The doctors were marked positively for their presence round the clock and repeated visits. The nurses were especially quoted for their humbleness and sympathetic attitude towards the patients. The patients had telephonic facility and food was offered, food and articles from their attendants were also provided. One patient mentioned some logistic issue she was facing, however, the general review was a high satisfaction level.

Many patients even after claiming that, the isolation was not affecting them later communicated its influence on

	e II: A few Verbatim Quotes from	
Sr.	Theme	Verbatim Quotes
1	Anxiety & Depression	"Initially I was very upset when I was tested positive, I rather couldn't believe it".
		"It is very sad to realize that now my two brothers, my son and my mother are all positive
		and admitted in quarantine, I cannot help them".
		"Initially I felt belittled and near to death, but now I have met life again".
2.	Fear	"I don't want to think about my situation as I feel afraid".
		"I am worried what will become of our jobs, our routines, I am already jobless for quite some time".
3.	Hopefulness & moving	"I have read somewhere that if you have will power, everything will go right, and now I
	forward	have gathered enough will power. Initially I was fearful but now I'm much better and
		hopeful".
		"You know when someone wakes up early morning to offer Fajr prayer; depressive
		thoughts cannot wander her mind".
4.	Health facilities & related	"The treatment here is outstanding, including the staff, the food provided, and the place as
	issues	a whole, I can call them on phone if I want to ask something".
		"All of them are very good; the doctors the nurses, the nurses are very caring and humble and give me hope".
5.	Living in isolation	"I want to get discharged soon. I will go to home, sit by my children, visit my mother's house
	-	and will fast with my family".
		"Since I'm a working woman, I have seen that my activity has gone from hundred to zero
		while I'm admitted here, I'm just limited to a room now".
6.	Physiological disturbances	"I can't sleep properly nor feel like eating something since admission".
	like sleep, appetite, smoking	"I have not felt like smoking again since I started to find it difficult to breathe and seen my
	or addiction, exercise	report marked positive; I couldn't smoke out of fear".

them. It was a usual disclaimer that it is difficult to remain isolated. Many of the working men and women explained how their routine was very hectic and now they are not doing anything at all. Some of them assumed that soon they will be discharged and their routine will again be similar. Many of them described how they have been coping with the new lifestyle. They would call their family and friends and talking to their loved ones would help them get by. They would scroll through social media, listen to the news or walk in the room. Lingering on more to the religion was an important way of life in the isolation that many relied upon. A few of our patients actually declared how they found it very hard to live separately in a room and they are waiting to get discharged and join their families.

Patients at the isolation ward usually found it difficult to fall asleep in the first few days of admission due to their anxiousness, later however many would experience a disturbance of sleep wake cycles, as they would fall asleep many times a day as they did not have much to do. The patients who were in respiratory distress lacked sound sleep until they recovered. One of our patients had loss of appetite; so as so, she would just take a couple of bites on repeated counseling. This behavior was for both the food provided at the hospital and the food from her home. Patients who were facing the loss of sense of smell and taste were still able to eat normally, but they found it a subtle experience.

Discussion

The COVID-19 patients depict mixed perceptions while admitted in the isolation ward at PIMS Islamabad. They are anxious yet motivated, depressed yet hopeful, and satisfied with the health care provided.

The COVID-19 pandemic has affected the world not only on health platforms but altered the economic streams and changed altogether our ways of life. 11 Majorly affected countries would wonder if they would ever be able to live like before if and whenever the pandemic does end! In a general population inquiry survey, some 61% of the population is fairly certain that covid-19 will change our way of life. 8,11-14 A survey found respondents in Vietnam, China, India and Italy expect to take the greatest personal financial impact with the perceived threat to health increasing in proximity to hotspots. More so over, rapidly changing situations and flashing news, which can be true or fabricated, false or misleading, would arouse a spark of anxiety in all who are subjected to it.

In such an environment, when a person comes across a COVID affected person, is himself suspected for the disease, gets himself tested, waits for the test report, is kept in quarantine or isolation, develops aggravating symptoms or is simply thinking of these facts, would experience a cascade of emotions and changing behaviors. 7-10 Visiting or learning about funerals, losing your loved ones, losing someone whose presence was determining for the family, may literally affect many lives for even the rest of their lives. Anxiety, fear and stress would easily take over and even pave way for depression!¹⁰ Unless seen in many, who have self-coping strategies and religious strengths to shift this load and stay calm, rather positive. Optimism would preserve their mental health. Life after corona may rather be different. Despite a decline of such unprecedented scale, humanity will still find the strength to recover. Values will change, our lives and habits will change, and our homes will also change under that influence.

The Centers for Disease Control and Prevention has released coping strategies for all who can get affected. 'Everyone reacts differently to stressful situations", they say! Fear and anxiety and worry about a disease can be overwhelming and cause strong emotions in adults and children.^{7,9} Changes in sleep or eating habits, trouble sleeping or focusing, worsening chronic health issues, worsening mental health conditions, increased use of alcohol, tobacco, or other medications are clearly reported on the record. Similar results can be seen in our study.

The patients' behavior and attitude is pivotal to his interest in his treatment, compliance, and recovery. Also, the corona virus infection due to its hidden characteristics would markedly affect the life of those who are affected by it and those who are closely associated with these people. This effect would be at least for a minimal considerable period and can be of various sorts. Anxiety is the major component as little is known about the course of the disease when considering the entire population, and even the world as a whole! Depending upon the personality type and clusters that primarily represent an individual he or she might easily get depressed and depression may prevail further if family support is not adequate. Parents and friends can be an effective source of care and motivation.

Since a similar study was a gap in literature but our review has led us to studies worldwide marking the awareness levels of the general population and caregivers. ^{7.8} Public opinion in China revealed that most respondents (97.1%) were optimistic that China will win the fight against COVID-19. ⁷ The COVID-19 information score (OR: 0.75-

0.90, P<0.001) was significantly correlated with a lower probability of negative attitudes and preventive behaviours towards COVID-19 in multiple logistic regression analysis. A Qualitative study revealed the psychological experience of nurses caring for COVID-19 patients. 9 There were four themes defined. First,' negative emotions' were present in the early stage, consisted of exhaustion, discomfort, and helplessness, were triggered by highintensity work, fear/anxiety, and concern for patients and family members. Second, psychological and life change, altruistic acts, team support, and ethical cognition were 'self-coping types'. Third, it observed 'growth under pressure,' which included increased affection and appreciation, professional responsibility development, and self-reflection. Finally, they showed that 'positive emotions' occurred with 'negative emotions' concurrently. These findings match with what we have disclosed with patients in perspective.

A cross sectional study carried out amongst health care providers in the UAE¹⁵reflected inadequate Knowledge and perceptions, and necessitated the need for further awareness sessions and educational interventions to improve the situation. A fast online survey evaluation was conducted by the Sustainable Social Development Organization (SSDO) in March-April 2020 to understand the social behaviours and expectations of individuals regarding COVID-19, the pandemic in Pakistan. It was published in Daily Newspaper 'The News' on 16th April 2020. It indicates a fair awareness level but also finds loopholes in knowledge attitudes and practices necessitating the need for further awareness. A similar study conducted in Bangladesh, highlights a significant proportion of their population having poor knowledge of its onset, symptoms and transmission, but showed a positive perception of COVID-19 prevention and control.16

A survey deployed to determine perceptions and understanding of COVID-19 in South Africa, Kenya, and Nigeria revealed high levels of awareness but yet a predilection of the population toward unproven misconceptions on the social media.¹⁷ However, a study in India revealed a modest level of understanding of COVID-19 infection and adequate knowledge of its preventive aspects. 18 In more than 80% of participants, the perceived need for mental wellbeing was seen. During this COVID-19 pandemic, a need to raise understanding and resolve people's mental health concerns was suggested. Another study laid forth a generally good knowledge about the disease and a positive attitude towards protective measures in Egyptian population.¹⁹ A survey in Spain laid down the society preview in this regard and also helped alter managing measures for the society at large.²⁰

In a survey conducted in the US and the UK, researchers identified several important misconceptions on how to prevent the acquisition of COVID-19, including beliefs in falsehoods circulating on social media and the intent to discriminate against individuals of East Asian ethnicity for fear of acquiring COVID-19.²¹⁻²⁴

Most relatively high socio-economic Chinese residents, particularly women, are knowledgeable about COVID-19, have positive attitudes and have acceptable COVID-19 practices. For Chinese people, health education initiatives aimed at enhancing COVID-19 awareness help preserve positive attitudes and appropriate practices. Due to the small representativeness of the study, when generalizing these results to communities of low socioeconomic status, we must be cautious.

Conclusion

Covid-19 patients depict mixed perceptions both positive and negative during admission in Isolation ward. They are anxious yet motivated, depressed yet hopeful and health care is mostly appreciated. However, they experience a disturbed living in isolation. Both quantitative and qualitative studies in future research are needed.

Acknowledgment: We would like to express our gratitude to all of the patients who shared their esteemed experiences and journey of COVID 19 with us for this study.

References

- Emami A, Javanmardi F, Pirbonyeh N, Akbari A. Prevalence of Underlying Diseases in Hospitalized Patients with COVID-19: a Systematic Review and Meta-Analysis. Archives of Academic Emergency Medicine. 2020; 8(1):e35. https://doi.org/10.1371/journal.pone.0241265
- Favre G, Pomar L, Musso D, Baud D. 2019-nCoV epidemic: what about pregnancies? The Lancet. 2020; 395(10224):e40.
 - https://doi.org/10.1016/S0140-6736(20)30311-1
- Schwartz DA, Graham AL. Potential maternal and infant outcomes from (Wuhan) coronavirus 2019-nCoV infecting pregnant women: Lessons from SARS, MERS, and other human coronavirus infections. Viruses. 2020 Feb; 12(2):194.
 - https://doi.org/10.3390/v12020194
- 4. Huang Y, Zhao N. Generalized anxiety disorder, depressive symptoms and sleep quality during COVID-19 outbreak in China: a web-based cross-sectional survey. Psychiatry research. 2020 Apr 12:112954.
 - https://doi.org/10.1016/j.psychres.2020.112954
- Kelvin DJ, Rubino S. Fear of the novel coronavirus. The Journal of Infection in Developing Countries. 2020; 14(01):1-2. https://doi.org/10.3855/jidc.12496

 Patel A, Jernigan DB. Initial public health response and interim clinical guidance for the 2019 novel coronavirus outbreak-United States, December 31, 2019-February 4, 2020. Morbidity and mortality weekly report. 2020 Feb 7:69(5):140.

https://doi.org/10.15585/mmwr.mm6908e1

Sun N, Shi S, Jiao D, Song R, Ma L, Wang H, Wang C, et al. A
Qualitative Study on the Psychological Experience of
Caregivers of COVID-19 Patients. American Journal of
Infection Control. 2020; 48(6):592-598.

https://doi.org/10.1016/j.ajic.2020.03.018

 Zhong BL, Luo W, Li HM, Zhang QQ, Liu XG, Li WT, Li Y. Knowledge, attitudes, and practices towards quick online COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a cross-sectional survey. International Journal of Biological Sciences. 2020; 16(10):1745.

https://doi.org/10.7150/ijbs.45221

- World Health Organization. 2019-nCoV outbreak is an emergency of international concern. 2020. http://www.euro.who.int/en/healthtopics/emergencies/pages/news/news/2020/01/2019ncov-outbreak-is-an-emergency-of-international-concern (access Apr 16, 2020).
- Baker SR, Farrokhnia RA, Meyer S, Pagel M, Yannelis C. "How Does Household Spending Respond to an Epidemic? Consumption during the 2020 COVID-19 Pandemic," NBER Working Papers 26949, National Bureau of Economic Research, Inc.

https://doi.org/10.3386/w26949

11. Fetzer T, Hensel L, Hermle J, Roth C. Coronavirus perceptions and economic anxiety. arXiv preprint arXiv: 2003.03848. 2020.

https://doi.org/10.1162/rest a 00946

- Roser M, Ritchie H, Ortiz-Ospina E, Hasell J. Coronavirus Pandemic (COVID-19)-Statistics and Research. Our World in Data 2020. Published online at OurWorldInData.org. Retrieved from: 'https://ourworldindata.org/coronavirus'
- Graham A, Cullen FT, Pickett J, Jonson CL, Haner M, Sloan MM. Faith in Trump, Moral Foundations, and Social Distancing Defiance During the Coronavirus Pandemic. (SSRN Scholarly Paper ID 3586626). Social Science Research Network. 2020; 6(1).

https://doi.org/10.1177/2378023120956815

- 14. Geldsetzer P. Knowledge and Perceptions of COVID-19 among the General Public in the United States and the United Kingdom: A Cross-sectional Online Survey. Ann Intern Med. 2020; 173(2):157-160. doi:10.7326/M20-0912 https://doi.org/10.7326/M20-0912
- Akshaya B, Jamal R, Deepak B, Wafa A. Knowledge and Perceptions of COVID-19 among Health Care Workers: Cross-Sectional Study. JMIR Public Health and Surveillance. 2020; 6: e19160.

https://doi.org/10.2196/19160

 Mannan DK, Mannan KA. Knowledge and perception towards Novel Coronavirus (COVID 19) in Bangladesh. International Research Journal of Business and Social Science. 2020; 6(2): 76-79.

https://doi.org/10.2139/ssrn.3576523

- Austrian K, Pinchoff J, Tidwell JB, White C, Abuya T, Kangwana B, et al. COVID-19 related knowledge, attitudes, practices and needs of households in informal settlements in Nairobi, Kenya. [Preprint]. Bull World Health Organ. E-pub: 6 April 2020. doi: http://dx.doi.org/10.2471/BLT.20.260281 https://doi.org/10.2471/BLT.20.260281
- 18. Roy D, Tripathy S, Kar SK, Sharma N, Verma SK, Kaushal V. Study of knowledge, attitude, anxiety & perceived mental healthcare need in Indian population during COVID-19 pandemic. Asian Journal of Psychiatry. 2020:102083. https://doi.org/10.1016/j.ajp.2020.102083
- 19. Abdelhafiz AS, Mohammed Z, Ibrahim ME, et al. Knowledge, Perceptions, and Attitude of Egyptians Towards the Novel Coronavirus Disease (COVID-19). J Community Health. 2020; 45(5):881-890. doi:10.1007/s10900-020-00827-7. https://doi.org/10.1007/s10900-020-00827-7
- 20. Oliver N, Barber X, Roomp K, Roomp K. The Covid19Impact Survey: Assessing the Pulse of the COVID-19 Pandemic in Spain via 24 questions. arXiv preprint arXiv:2004.01014. 2020 Apr 2.

https://doi.org/10.1037/t78148-000

- 21. Clements JM. Knowledge and Behaviors Toward COVID-19 Among US Residents During the Early Days of the Pandemic: Cross-Sectional Online Questionnaire. JMIR Public Health and Surveillance. 2020; 6(2):e19161. https://doi.org/10.2196/19161
- 22. Jones J, Sullivan PS, Sanchez TH, Guest JL, Hall EW, Luisi N, Zlotorzynska M, Wilde G, Bradley H, Siegler AJ. Similarities and differences in COVID-19 awareness, concern, and symptoms by race and ethnicity in the United States: cross-sectional survey. Journal of medical Internet research. 2020; 22(7):e20001.

https://doi.org/10.2196/20001

 Leão T, Amorim M, Fraga S, Barros H. What doubts, concerns and fears about COVID-19 emerged during the first wave of the pandemic? Patient Education and Counseling. 2020 Nov 5.

https://doi.org/10.1016/j.pec.2020.11.002

24. Parsons Leigh J, Fiest K, Brundin-Mather R, Plotnikoff K, Soo A, Sypes EE, et al. A national cross-sectional survey of public perceptions of the COVID-19 pandemic: Self-reported beliefs, knowledge, and behaviors. PloS one. 2020 Oct 23; 15(10):e0241259.

https://doi.org/10.1371/journal.pone.0241259