Check for updates

RESEARCH ARTICLE

Massive Open Online Course (MOOC) Opportunities in Health Education (HE) in a mandatory social isolation context

[version 1; peer review: 1 approved with reservations, 1 not approved]

Gandy Dolores-Maldonado ^{1,2}, Jorge L. Cañari-Casaño³,
Rosalia Montero-Romainville^{1,4}, German Malaga¹

¹Unidad de Conocimiento y Evidencia (CONEVID), Universidad Peruana Cayetano Heredia, Lima, Peru

²Núcleo de Investigación en Alimentación y Nutrición, Universidad Nacional Mayor de San Marcos, Lima, Peru

³Emerge, Emerging Diseases and Climate Change Research Unit, School of Public Health and Administration, Universidad Peruana Cayetano Heredia., Lima, Peru

⁴Unidad de Ciudadanía Intercultural y Salud Indígena. Facultad de Salud Pública y Administración. Universidad Peruana Cayetano Heredia, Lima, Peru

V1 First published: 26 Apr 2021, 10:322
<https://doi.org/10.12688/f1000research.52049.1>
Latest published: 26 May 2022, 10:322
<https://doi.org/10.12688/f1000research.52049.2>

Abstract

Background: Routine care for prevention and health promotion has reduced significantly due to the Covid-19 pandemic and mandatory social isolation measures. In this context, it is necessary to identify and describe Massive Open Online Courses (MOOCs) that provide opportunities for health education, promotion, and prevention aimed at the general population. The study is a systematic review of MOOCs on health education, health promotion, and prevention for the general population in a pandemic context.

Methods: We developed a search for MOOC courses aimed at the general population on health education, health promotion, and prevention in different available MOOC platforms. We executed a descriptive analysis of the main characteristics of the selected MOOCs.

Results: There were 117 MOOCs chosen on health education, promotion, and prevention for the general population. Coursera (40.3%) was the platform that offered the highest quantity of MOOCs; more than half of the MOOCs were in English (52.9%). The median (interquartile range) duration of the selected MOOCs was 11 (6–15) hours. The predominant themes were "Health promotion" (43%) and "Food and nutrition" (31%), and the origin was mainly from Europe (37.8%).

Conclusions: MOOC offerings in health education are diverse, predominantly in English, of European origin, and in health promotion issues. This study opens an opportunity to multiply initiatives in

Open Peer Review

Approval Status

	1	2
version 2		
(revision)
26 May 2022		view

version 1
26 Apr 2021	view	view

1. Waleed Mugahed Al-Rahmi , Universiti Teknologi Malaysia, Johor Bahru, Malaysia
2. Maya Adam, Stanford University, Stanford, USA

Any reports and responses or comments on the article can be found at the end of the article.

different territories, considering other languages and topics more akin to each territorial reality, allowing it to be a more equitable learning opportunity in times of pandemic and compulsory social isolation.

Keywords

health education, MOOC, eHealth, digital health literacy, eLearning, Social isolation

This article is included in the **Health Services** gateway.

Corresponding author: Gandy Dolores-Maldonado (dgandykerlin@gmail.com)

Author roles: **Dolores-Maldonado G:** Conceptualization, Investigation, Methodology, Project Administration, Supervision, Writing – Original Draft Preparation, Writing – Review & Editing; **Cañari-Casaño JL:** Formal Analysis, Investigation, Writing – Original Draft Preparation, Writing – Review & Editing; **Montero-Romainville R:** Investigation, Methodology, Writing – Original Draft Preparation, Writing – Review & Editing; **Malaga G:** Investigation, Writing – Original Draft Preparation, Writing – Review & Editing

Competing interests: No competing interests were disclosed.

Grant information: The author(s) declared that no grants were involved in supporting this work.

Copyright: © 2021 Dolores-Maldonado G *et al.* This is an open access article distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

How to cite this article: Dolores-Maldonado G, Cañari-Casaño JL, Montero-Romainville R and Malaga G. **Massive Open Online Course (MOOC) Opportunities in Health Education (HE) in a mandatory social isolation context [version 1; peer review: 1 approved with reservations, 1 not approved]** F1000Research 2021, 10:322 <https://doi.org/10.12688/f1000research.52049.1>

First published: 26 Apr 2021, 10:322 <https://doi.org/10.12688/f1000research.52049.1>

Introduction

In December 2019, the COVID-19 pandemic was triggered by severe acute respiratory syndrome coronavirus 2 (SARS-Cov-2), revealing the fragility of the health systems of developing countries; as of February 1, 2021, the cases amounted were 134,228,450, with 2,229,565 deaths worldwide ([COVID-19 Map - Johns Hopkins Coronavirus Resource Center](#)) and the countries with the highest fatality due to COVID-19 are mostly low-middle-income countries (LMICs) with precarious health systems or those that have already collapsed.²²

Primary care service efforts have concentrated on containing the COVID-19 pandemic, for which there is a great concern about what could be neglected ([OPS/OMS Perú - OPS/OMS Perú](#)), reduction in access to medical doctors, drugs and growth monitoring during the lockdown period.³ Also, disruptions in drug supply chains are likely associated with defaulters on immunization schedules, which may lead to future outbreaks of preventable diseases such as diphtheria.⁴ It has been estimated that maternal and child neglect in LMICs could be devastating in a context where maternal deaths could increase up to 60% and infant mortality up to 41%.⁵ The control of endemic infectious diseases, such as malaria,⁶ as well as chronic non-communicable diseases (NCDs), such as hypertension and diabetes, have been neglected or suspended,⁷ and there has been an increase in mental illnesses such as anxiety, depression, and suicide.⁸ Furthermore, there is a concern of the population to visit health systems for their routine care for fear of contagion.⁹ Against this, some countries implemented remote healthcare systems (teleconsultation)¹⁰ and health communication campaigns. However, these strategies have been insufficient to cover the demand for healthcare effected by the pandemic and mandatory social isolation measures.

The pandemic context requires changes and identification of strategies that can help meet the indirect effects of neglect of diseases not related to COVID-19 in health systems. In this scenario, Massive Open Online Courses (MOOCs) could be an educational option to disseminate systematized courses on education, health promotion, and prevention aimed at the general population.

MOOCs, in the past, have been an opportunity for health education for developing countries. Among their advantages are global accessibility, flexible hours, multiple teaching tools, and that they are generally free. MOOCs have been an educational response to emerging and re-emerging disease epidemics.¹¹ However, to access these resources, inequities exist for developing countries, such as language barriers and technological access.¹²

Methods

For this study, we conducted a digital search on MOOC platforms like Coursera, edX, FutureLearn, XuentangX, Udacity, Miríadax, Alison, Canvas Network, and OpenWHO, among others to identify MOOCs with content related to health education (education, promotion, and prevention of health) aimed at the general public. Also, the search involved explored topics related to health, well-being, and medicine. We included terms as nutrition, healthy life, physical activity, medical care, healthy nutrition, mental health, and variants.

Three authors conducted the MOOC search manually and independently on the mentioned virtual platforms. The search development was between the months of June and December 2020. Likewise, we had to consult websites on larger platforms available in the world like [Class Central](#) and MOOC List. We started the search of each virtual platform and examined MOOC contents with the terms described above. The eligibility criteria for selecting the MOOCs were that they had content related to health education, and were aimed at the general population; further, we considered availability of registration/access at the time of the search.

Subsequently, through a peer review, the researchers excluded MOOCs that showed highly specialized content or requested a prerequisite. MOOCs aimed at professionals or indicated that they were MOOCs for professional certification were also not considered, neither were those only available as paid content. If a conflict or inconsistency existed about our exclusion criteria, it was solved through deliberation peer review. We organized MOOCs by groups according to similar topics for a better description.

The data analysis was about the place of origin, principal language, and duration of the course. We used frequency measures to describe the categorical characteristics and dispersion measures to describe the hours. The analysis was using STATA version 16 ([RRID:SCR_012763](#)), Statistical analysis may also be performed using RStudio open source software for Windows, version 4.0.0.

Results

With the established search criteria, a total of 217 MOOC courses were found on the different platforms. After excluding MOOC courses because they were specialized, unavailable, aimed at other target audiences, or without relation to health education, we selected 117 of the total MOOCs to be analyzed ([Figure 1](#)).

Figure 1. Flow diagram.

The 117 MOOCs analyzed were classified into six groups according to their content, with themes such as “health promotion” and “food and nutrition”. These latter two accounted for more than 60% of the total MOOCs included. Regarding the duration of time, the MOOCs had a median (interquartile range) of 11⁶⁻¹⁵ hours and the topics of health promotion and community health and social rights presented higher medians, as well as a minimum of 8.5 hours and a maximum of 16.5 hours (Table 1).

Of the total number of courses on the topics “Health promotion” and “Psychology and mental health”, 21 (50%) and 12 (52.17%) were offered on the Coursera platform. (Table 2). Likewise, all the courses around COVID19 (5 MOOCs) were classified (4 MOOCs) in “Psychology and mental health” and 1 (4 MOOC) in “Health promotion”.

Table 1. Frequency, median and interquartile range of MOOC duration time.

N°	Topics	N (%)	Median (IR)
1	Health promotion	42 (35.9)	12 (8.5-16.5)
2	Food and nutrition	31 (26.5)	9 (6-12)
3	Psychology and mental health	23 (19.7)	11 (5-16)
4	Health care	13 (11.1)	10 (6-12)
5	Climate change and health	4 (3.4)	2 (2-5)
6	Community health/social rights Total	4 (3.4)	15 (13.5-16)
	Total	117 (100)	11 (6-15)

IR: Interquartile range.

Table 2. Distribution of MOOC topics by platform.

Topics	Platform					
	Coursera	Future Learn	Class Central	Edx	Other	Total
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Health promotion	21 (50)	6 (14.3)	8 (19.1)	6 (14.3)	1 (2.3)	42 (100)
Food and nutrition	9 (29.0)	10 (32.3)	8 (25.8)	1 (3.2)	3 (9.7)	31 (100)
Psychology and mental health	12 (52.2)	8 (34.8)	1 (4.3)	0 (0.00)	2 (8.7)	23 (100)
Health care	2 (15.4)	3 (23.0)	2 (15.4)	5 (38.5)	1 (7.7)	13 (100)
Climate change and health	0 (0)	0 (0)	0 (0)	0 (0)	4 (100)	4 (100)
Community health/social rights Total	3 (75)	1 (25)	0 (0)	0 (0)	0 (0)	4 (100)

*The rows represent 100%.

Table 3. Distribution of MOOC topics by language and origin.

Topic	Language					Origin				
	English n (%)	Spanish n (%)	French n (%)	Russian n (%)	Other n (%)	America n (%)	Asia n (%)	Europe n (%)	Oceania n (%)	Other n (%)
Health promotion	20 (47.6)	6 (14.3)	6 (14.3)	5 (11.9)	5 (11.9)	11 (26.2)	10 (23.8)	16 (38.1)	1 (2.4)	4 (9.5)
Food and nutrition	16 (51.6)	5 (16.1)	3 (9.7)	1 (3.2)	6 (19.4)	7 (22.6)	10 (32.3)	9 (29)	2 (6.4)	3 (9.7)
Psychology and mental health	15 (65.2)	1 (4.4)	1 (4.4)	4 (17.4)	2 (8.6)	5 (21.7)	4 (17.4)	10 (43.5)	2 (8.7)	2 (8.7)
Health care	8 (61.5)	1 (7.7)	2 (15.4)	0 (0.0)	2 (15.4)	1 (7.7)	2 (15.4)	8 (61.5)	1 (7.7)	1 (7.7)
Climate change and health	0 (0.0)	4 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	4 (100)	0 (0)
Community health/social rights Total	3 (75)	1 (25)	0 (0)	0 (0)	0 (0)	3 (75)	0 (0)	1 (25)	0 (0)	0 (0)

*The rows represent 100%.

Regarding the principal language, English was identified in 62 (53%) of the MOOCs the language of preference, followed by Spanish in 18 (15.4%) MOOC courses (data not shown). Likewise, the principal language for all topics was English, with the exception of the climate change and health topics (See [Table 3](#)).

Regarding the origin of the MOOC courses, we found that 44 (37.6%) of the MOOCs were from institutions in Europe, followed by America 27 (23.1%) and Asia 26 (22.2%) (Data not shown). In the case of America, 25 (21.4%) were from North America and 2 (1.7%) from South America (data not shown). The topics of health promotion, psychology, and mental health and health care came mainly from universities in Europe; and the food and nutrition topic mainly from Asia (See [Table 3](#)).

Discussion

We identified 117 MOOC courses on health promotion. The majority are offered in English and are carried out mainly by institutions in Europe. Most of the courses were on the topics of health promotion and food and nutrition.

From the preliminary search, it was evident that a large number of MOOCs were highly specialized, were aimed at professionals,^{13,14} or offered professional certification,^{11,15,16,17} and some are not available without payment. Although we have not included these MOOCs in the study, it is essential to notice that it can be an indicator of the limited supply of MOOCs with a profile aimed at the general public or users of primary level care centers, with the content of free health education and aimed at prevention and healthcare. We consider that this is an extremely important point regarding access to health education in a context of compulsory social isolation.

Regarding the predominant themes of health promotion and food and nutrition, certain similarity was found with another study whose main topics were food, nutrition, your health, and introduction to health nursing, courses were aimed at professionals.¹⁸ MOOCs on health and medicine allow patients to acquire health education on specialized topics. Patients can gain understanding in disease implications, conditions, techniques, and available interventions around their disease, especially in the early stages. Besides, there are some useful topics which are still taboo, such as contraception, drug addiction, and acquired immunodeficiency syndrome (AIDS); courses focused on these topics help people educate themselves without having to visit an office.

The MOOCs found around psychology and mental health turn out to be a learning opportunity for stress management in times of compulsory social isolation. The results end up being part of recommendations to review said web-based interventions in mental health literacy promotion.¹⁹ Because adolescents and young people present more difficulties²⁰ for decision-making in health often searching for information on the web,²¹ it is evident that they do not differentiate between reliable and less reliable information and that they do not know how to translate what they read into healthy behaviors.²²

Among other issues, community health and social rights take a position in the context of compulsory social isolation since many decisions about health can be taken collectively in the community environment;²³ additionally, many of them can be taken at the family level or by the influence of peers, without considering the repercussions of community leadership in some scenarios.²⁴ Therefore, individual decisions can be even more relevant; for example, vaccination can affect a significant group of the population and have an impact on a higher incidence of some pathologies at the community level,²⁵ especially when there is an increase in those who will not be vaccinated even during the COVID-19 pandemic.²⁶

Therefore, access to information through a MOOC could empower people who would not otherwise know about the options offered.¹⁸ This study shows that various institutions and organizations worldwide have seen MOOCs as an educational opportunity due to their relatively low cost²⁷ and whose success depends on the quality of their contents,²⁸ the teacher's strategies, and the focused courses.

Similar to previous studies was evidence that the Coursera platform was the one that hosted the largest number of MOOCs.^{18,29} Regarding the origin of the MOOCs, the largest number were from developed countries,³⁰ from institutions in Europe and North America, similar results were described in other studies,^{11,18,31} being, by default smaller quantity offered by Latin American countries.³² This predominant origin could be because more than half of the MOOCs were offered and developed in English^{11,18,33} and only 22% in Spanish. Proof of this is that of the 23, 13, and four MOOCs on psychology and mental health, health care, community health and social rights, respectively, only one MOOC for each topic was in Spanish.

Because the majority of MOOCs are in English, it may be a limitation for access and learning opportunities in times of pandemic for the Latin American population. As well as language, aspects such as the absence of a computer and internet, or educational level³⁴ may also limit access to MOOCs in times of compulsory social isolation.

Considering the fact that these courses were offered by developed countries, this could limit the topics addressed to being oriented with a different health reality from that of developing countries, where diseases such as anemia, malnutrition, or infectious diseases are the most frequent. This scenario could explain the high level of MOOCs from North America and Europe (Heather Miller and Martin Odersky. *Functional Programming Principles in Scala: Impressions and Statistics | Scala Documentation*) compared with South America, Africa, and Oceania.³⁶ It is known that courses are built based on a context and socioeconomic condition for a target population, and participation levels were higher when considered these variables.²⁸ MOOCs with an approach based on the reality of LMICs³⁷ could be an opportunity, addressing issues such as chronic malnutrition, anemia, among frequent health problems that this population suffers, even more so in times of pandemic due to the restricted care of primary health centers to provide services on these issues.

Among the limitations were that the chosen courses are based exclusively on the authors' criteria. The possibility of including studies that did not meet the inclusion criteria was lowered by performing the peer review. Courses classified into topics related to health education considered when compiling MOOCs for the review. However, if a MOOC has an incorrect classification, it would not have been identified for review. In cases for which MOOCs were offered in languages different than English, we used Google Translate for content translation. Finally, the study aimed not to evaluate the quality of the contents in the MOOCs; however, almost all the MOOCs declared their institutional origin, which was predominantly universities.

Finally, the study showed most of the MOOC courses in health education aimed at the general population or users of health systems were framed mainly in the themes of health promotion and food and nutrition, originating from European institutions and North America and with a higher predominance of the English language.

MOOCs are shown as key tools to empower people, so in a pandemic context, the need to invest in alternative methods of dissemination of knowledge for knowledge-based empowerment would arise, covering the capacities of the general public that at present it is affected by not having access to care in health services of the first level of care. In addition to this, a critical shortage of human resources in health and healthcare, comprising a limited number of medical professors and limitations in physical infrastructures are reasons that increase the need to access online courses in health education of the level primary. Although the MOOCs' origin was mainly from university institutions a future analysis of the quality of the contents must be addressed for greater comprehensiveness.

Data availability

Underlying data

Open Science Framework: Underlying data for 'Massive Open Online Course (MOOC) Opportunities on in Health Education (HE) during of mandatory social isolation context', <https://doi.org/10.17605/OSF.IO/5UJ3V>.³⁸

This project contains the following underlying data:

A database with information from the MOOCs, institutions, platform and language.

Data are available under the terms of the **Creative Commons Zero "No rights reserved" data waiver** (CC0 1.0 Public domain dedication).

Acknowledgements

We express our acknowledgement to Corali Torres Paz de Fetaya for her review of the English version of our manuscript. JLC is a doctoral student studying an Epidemiological Research Doctorate at Universidad Peruana Cayetano Heredia under FONDECYT/CIENCIACTIVA award EF033-235-2015 and supported by training grant D43 TW007393 awarded by the Fogarty International Center of the US National Institutes of Health.

References

1. Llanos Zavalaga LF, Castro Quiroz JA, Ortiz Fernández J, Ramírez Atencio CW: **Cuando crear sinergia no siempre es Salud: Análisis y propuesta en la evolución del Sistema de Salud en Perú.** *Rev Medica Hered* 2020 Apr 29 [cited 2020 Oct 25]; 31(1): 56–69.
Publisher Full Text
2. Navarro JC, Arrivillaga-Henríquez J, Salazar-Loor J, Rodríguez-Morales AJ: **COVID-19 and dengue, co-epidemics in Ecuador and other countries in Latin America: Pushing strained health care systems over the edge [Internet].** Vol. 37, Travel Medicine and Infectious Disease. Elsevier Inc.; 2020 [cited 2021 Jan 8]. p. 101656.
Reference Source

3. Matsungu TM, Chopera P: **Effect of the COVID-19-induced lockdown on nutrition, health and lifestyle patterns among adults in Zimbabwe.** *BMJ Nutr Prev Heal* 2020 Dec 1 [cited 2021 Feb 23]; **3**(2): 205–12. Available from: <http://www.bmj-nutrition-prevention-and-health.com/content/3/2/205>.
4. Nelson R: **COVID-19 disrupts vaccine delivery.** *Lancet Infect Dis* 2020 May 1 [cited 2021 Feb 23]; **20**(5): 546. [PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
5. Roberton T, Carter ED, Chou VB, Stegmüller AR, Jackson BD, Tam Y, et al.: **Early estimates of the indirect effects of the COVID-19 pandemic on maternal and child mortality in low-income and middle-income countries: a modelling study.** *Lancet Glob Heal* 2020 Jul 1 [cited 2020 Oct 25]; **8**(7): e901–8. [Reference Source](#)
6. Torres K, Alava F, Soto-Calle V, Llanos-Cuentas A, Rodríguez H, Llacsahuanga L, et al.: **Malaria Situation in the Peruvian Amazon during the COVID-19 Pandemic.** *Am J Trop Med Hyg* 2020 Sep 3 [cited 2020 Oct 25]; **tpmd200889**. [Reference Source](#)
7. Pesantes MA, Lazo-Porras M, Cárdenas MK, Díez-Canseco F, Tanaka-Zafra JH, Carrillo-Larco RM, et al.: **Diabetes, COVID-19 y atención primaria.** *Rev Peru Med Exp Salud Publica* 2020 Sep 24 [cited 2020 Oct 25]; **37**(3): 541–6. [Publisher Full Text](#)
8. Roy A, Singh AK, Mishra S, Chinnadurai A, Mitra A, Bakshi O: **Mental health implications of COVID-19 pandemic and its response in India [Internet].** *International Journal of Social Psychiatry* SAGE Publications Ltd; 2020 [cited 2021 Jan 8]. [PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
9. Huaracaya-Victoria J: **Mental health considerations about the COVID-19 pandemic.** *Rev Peru Med Exp Salud Publica* 2020 [cited 2020 Oct 25]; **37**(2): 327–34. [Publisher Full Text](#)
10. Bhaskar S, Bradley S, Chattu VK, et al.: **Telemedicine Across the Globe-Position Paper From the COVID-19 Pandemic Health System Resilience PROGRAM (REPROGRAM) International Consortium (Part 1).** *Front Public Heal*. 2020 Oct; **556720**: 8. [PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
11. Hernández-Vásquez A, Bendezu-Quispe G, Torres-Roman JS, Salinas-Ochoa B: **Utility of massive open online courses (MOOCs) concerning outbreaks of emerging and reemerging diseases.** *F1000Research*. 2017 [cited 2020 Oct 25]; **6**. [PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
12. Lambert SR: **Do MOOCs contribute to student equity and social inclusion? A systematic review 2014–18.** *Comput Educ*. 2020 Feb 1; **145**: 103693.
13. Mahajan R, Gupta P, Singh T: **Massive Open Online Courses: Concept and Implications [Internet].** Vol. 489, INDIAN PEDIATRICS. 2019 [cited 2020 Oct 25]. [Reference Source](#)
14. Bendezu-Quispe G, Quijano-Escate R, Hernández-Vásquez A, Inga-Berrosipi F, Condor DF: **Massive open online courses for continuing education for nursing professionals in Peru.** *Rev Lat Am Enfermagem* 2020 [cited 2020 Oct 25]; **28**: 1–7. [Reference Source](#)
15. Maxwell WD, Fabel PH, Diaz V, Walkow JC, Kwiek NC, Kanchanaraksa S, et al.: **Massive open online courses in U.S. healthcare education: Practical considerations and lessons learned from implementation.** *Curr Pharm Teach Learn* 2018 Jun 1 [cited 2020 Oct 25]; **10**(6): 736–43. [Reference Source](#)
16. Updated numbers from our platform - FutureLearn [Internet]. [cited 2020 Oct 25]. Available from: [Reference Source](#)
17. Christensen G, Steinmetz A, Alcorn B, Bennett A, Woods D, Emanuel EJ: **The MOOC Phenomenon: Who Takes Massive Open Online Courses and Why?** *SSRN Electron J* 2014 Apr 23 [cited 2020 Oct 25]. [Reference Source](#)
18. Liyanagunawardena TR, Williams SA: **Massive open online courses on health and medicine: Review. Vol. 16.** *Journal of Medical Internet Research*. 2014: e191.
19. Brijnath B, Protheroe J, Mahtani KR, Antoniadou J: **Do web-based mental health literacy interventions improve the mental health literacy of adult consumers? results from a systematic review.** *J Med Internet Res* 2016 Jun 1 [cited 2020 Oct 25]; **18**(6). [Reference Source](#)
20. Kutcher S, Bagnell A, Wei Y: **Mental Health Literacy in Secondary Schools. A Canadian Approach.** *Child Adolesc Psychiatr Clin N Am* 2015 Apr 1 [cited 2020 Oct 25]; **24**(2): 233–44. [Reference Source](#)
21. Kim SU, Syn SY: **Research trends in teens' health information behaviour: A review of the literature.** *Health Info Libr J* 2014 [cited 2020 Oct 25]; **31**(1): 4–19. [PubMed Abstract](#) | [Publisher Full Text](#)
22. Jain AV, Bickham D: **Adolescent health literacy and the Internet: Challenges and opportunities.** *Curr Opin Pediatr* 2014 [cited 2020 Oct 25]; **26**(4): 435–9. [PubMed Abstract](#) | [Publisher Full Text](#)
23. Harris J, Springett J, Croot L, Booth A, Campbell F, Thompson J, et al.: **Can community-based peer support promote health literacy and reduce inequalities? A realist review.** *Public Heal Res* 2015 Feb [cited 2020 Oct 25]; **3**(3): 1–192. [Reference Source](#)
24. Batterham RW, Hawkins M, Collins PA, Buchbinder R, Osborne RH: **Health literacy: Applying current concepts to improve health services and reduce health inequalities.** *Public Health* 2016 Mar 1 [cited 2020 Oct 25]; **132**: 3–12. [PubMed Abstract](#) | [Publisher Full Text](#)
25. French MG: **Relevance of Health Literacy to Precision Medicine [Internet].** *Relevance of Health Literacy to Precision Medicine* 2016 [cited 2020 Oct 25]. [Reference Source](#)
26. Lazarus JV, Ratzan SC, Palayew A, Gostin LO, Larson HJ, Rabin K, et al.: **A global survey of potential acceptance of a COVID-19 vaccine.** *Nat Med* 2020 Oct 20 [cited 2021 Jan 30]; 1–4. [Publisher Full Text](#)
27. Hoy MB: **MOOCs 101: An Introduction to Massive Open Online Courses.** *Med Ref Serv Q* 2014 Jan [cited 2020 Oct 25]; **33**(1): 85–91. [PubMed Abstract](#) | [Publisher Full Text](#)
28. Barteit S, Sié A, Yé M, Depoux A, Louis VR, Sauerborn R: **Lessons learned on teaching a global audience with massive open online courses (MOOCs) on health impacts of climate change: A commentary.** *Global Health* 2019 Aug 22 [cited 2020 Oct 25]; **15**(1): 52. [Reference Source](#)
29. The impact and reach of MOOCs: A developing countries' perspective. [cited 2020 Oct 25]. [Reference Source](#)
30. Pereyra-Elías R, Huaccho-Rojas JJ, Taype-Rondán Á, et al.: **Publicación y factores asociados en docentes universitarios de investigación científica de escuelas de medicina del Perú.** *Rev Peru Med Exp Salud Publica*. 2014 Sep 25; **31**(3).
31. Subhi YAKRBS, et al.: **Massive open online courses are relevant for postgraduate medical training.** *Dan Med J*. 2014 [cited 2020 Oct 25]; 01–10. [Reference Source](#)
32. Culquichicón C, Helguero-Santín LM, Labán-Seminario LM, Cardona-Ospina JA, Aboshady OA, Correa R: **Massive open online courses in health sciences from Latin American institutions: A need for improvement? [Internet].** *F1000Research. Faculty of 1000 Ltd* 2017 [cited 2020 Oct 25]; **6**. [PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
33. Quijano-Escate R, Rebatta-Acuña A, Garayar-Peceros H, Gutierrez-Flores KE, Bendezu-Quispe G: **Learning in times of social isolation: Massive open online courses on COVID-19.** *Rev Peru Med Exp Salud Publica* 2020 Sep 24 [cited 2020 Oct 25]; **37**(2): 375–7. [Publisher Full Text](#)
34. Goldberg LR, Bell E, King C, O'Mara C, McInerney F, Robinson A, et al.: **Relationship between participants' level of education and engagement in their completion of the Understanding Dementia Massive Open Online Course Approaches to teaching and learning.** *BMC Med Educ* 2015 Mar 26 [cited 2020 Oct 25]; **15**(1): 60. [Reference Source](#)
35. View of MOOCs: A systematic study of the published literature 2008–2012 [Internet]. [cited 2020 Oct 25]. [Reference Source](#)
36. Koutropoulos A, GMS. ASC. WI. HRJ. KNO. et al. **Emotive Vocabulary in MOOCs: Context & Participant Retention** *European Journal of Open, Distance and E-Learning*. I. Eur J Open, Distance E-Learning [Internet]. 2012 [cited 2020 Oct 25]. [Reference Source](#)
37. Nilsson M, Evengård B, Sauerborn R, Byass P: **Connecting the Global Climate Change and Public Health Agendas.** *PLoS Med* 2012 Jun 5 [cited 2020 Oct 25]; **9**(6): e1001227. [Publisher Full Text](#)
38. Maldonado GKD:(2021, April 2). **Massive Open Online Course (MOOC) Opportunities on in Health Education (HE) during of mandatory social isolation context.** [Publisher Full Text](#)

Open Peer Review

Current Peer Review Status:

Version 1

Reviewer Report 16 February 2022

<https://doi.org/10.5256/f1000research.55275.r121485>

© 2022 Adam M. This is an open access peer review report distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Maya Adam

Stanford University, Stanford, CA, 94305, USA

In general, I think this is a very interesting manuscript and it makes a potentially valuable contribution to the literature on open online public health education.

Some suggestions for improvement follow:

In the background/rationale for the study, I wonder if the authors might also consider adding some brief statistics about the rise in global engagement with online courses that was spurred by the pandemic? Then the narrative would roughly go: 1) Routine care and preventive health visits went down, 2) General education through open online courses went up, 3) Can open online public health courses function as a potential bridge at times like these when face-to-face interactions are limited?

In the methods section of the abstract, it would be helpful to briefly (but a bit more clearly) describe the inclusion and exclusion criteria for the courses described in this study.

I think the conclusion in this study could be more clearly worded, especially in the abstract. Phrases like "in health promotion issues" and "multiply initiatives in distant territories" are somewhat vague and could be stated more clearly. I also think this study speaks to the potential for massive open online public health courses to increase access to important health promotion messages, even outside of "times of pandemic and compulsory social isolation". This is an interesting direction for future research that could be stated here.

I have to preface this next comment by applauding the authors for their ability to write an academic manuscript in a language that may not be their first, based on their institutional affiliations. I could not have written an academic manuscript like this in a second language. One comment that I hope will be helpful: In general, the use of strong, active verbs throughout would strengthen the writing stylistically. For example, a sentence like *"In December 2019, the COVID-19 pandemic was triggered by severe acute respiratory syndrome coronavirus 2 (SARSCov-2), revealing the fragility of the health systems of developing countries."* Could be rewritten to read: "In December

2019, the severe acute respiratory syndrome coronavirus 2 (SARSCov-2) triggered the COVID-19 pandemic." Another example "*It has been estimated that maternal and child neglect in LMICs could be devastating...*" could be more strongly worded as "Researchers suggest that maternal and child health neglect..." (or similar).

Secondly, longer "run-on" sentences can become sources of confusion. An example of this is your sentence: "*The pandemic context requires changes and identification of strategies that can help meet the indirect effects of neglect of diseases not related to COVID-19 in health systems.*" Perhaps this sentence could be revised to be simpler and more direct so that it's easier to understand on first pass.

My final suggestion: it might be interesting to include information about enrollment number for the different courses. These are often available to the public and could give a better sense of the potential for global reach and scaling of these courses.

Is the work clearly and accurately presented and does it cite the current literature?

Yes

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Partly

If applicable, is the statistical analysis and its interpretation appropriate?

I cannot comment. A qualified statistician is required.

Are all the source data underlying the results available to ensure full reproducibility?

No source data required

Are the conclusions drawn adequately supported by the results?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Health communication, health promotion

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 12 May 2022

GANDY KERLIN GANDY KERLIN

Dear Maya Adam

We are very grateful for your comments and suggestions. Below are the responses to each

of the comments:

In general, I think this is a fascinating manuscript and it makes a potentially valuable contribution to the literature on open online public health education.

Some suggestions for improvement follow:

First suggestion:

In the background/rationale for the study, I wonder if the authors might also consider adding some brief statistics about the rise in global engagement with online courses that was spurred by the pandemic? Then the narrative would roughly go: 1) Routine care and preventive health visits went down, 2) General education through open online courses went up, 3) Can open online public health courses function as a potential bridge at times like these when face-to-face interactions are limited?

Answer:

Thank you very much for your comments; it's very interesting. We have added statistics about online courses during the pandemic according to class central and Shravan Goli, boss of the products to MOOCs Coursera. Also, we have structured the introduction according to your suggestion.

Second suggestion:

In the methods section of the abstract, it would be helpful to briefly (but a bit more clearly) describe the inclusion and exclusion criteria for the courses described in this study.

Answer:

We consider this recommendation very precise. We briefly added the inclusion and exclusion criteria.

Third suggestion:

I think the conclusion in this study could be more clearly worded, especially in the abstract. Phrases like "in health promotion issues" and "multiply initiatives in distant territories" are somewhat vague and could be stated more clearly. I also think this study speaks to the potential for massive open online public health courses to increase access to important health promotion messages, even outside of "times of pandemic and compulsory social isolation". This is an interesting direction for future research that could be stated here.

Answer:

Your comment is very pertinent. We have omitted some phrases and modified the conclusion in the abstract.

Fourth suggestion

I have to preface this next comment by applauding the authors for their ability to write an academic manuscript in a language that may not be their first, based on their institutional affiliations. I could not have written an academic manuscript like this in a second language. One comment that I hope will be helpful: In general, the use of strong, active verbs throughout would strengthen the writing stylistically. For example, a sentence like "In December 2019, the COVID-19 pandemic was triggered by severe acute respiratory

syndrome coronavirus 2 (SARSCov-2), revealing the fragility of the health systems of developing countries." Could be rewritten to read: "In December 2019, the severe acute respiratory syndrome coronavirus 2 (SARSCov-2) triggered the COVID-19 pandemic." Another example "It has been estimated that maternal and child neglect in LMICs could be devastating..." could be more strongly worded as "Researchers suggest that maternal and child health neglect..." (or similar). Secondly, longer "run-on" sentences can become sources of confusion. An example of this is your sentence: "The pandemic context requires changes and identification of strategies that can help meet the indirect effects of neglect of diseases not related to COVID-19 in health systems." Perhaps this sentence could be revised to be simpler and more direct so that it's easier to understand on first pass.

Answer:

Thank you very much for your accurate comments and examples. We have identified different phrases longer and that can cause confusion. We have modified some sentences for a better understanding.

Fifth suggestion:

My final suggestion: it might be interesting to include information about enrollment number for the different courses. These are often available to the public and could give a better sense of the potential for global reach and scaling of these courses.

Answer:

Thank you very much for your comment. We are trying to keep up with the number of people enrolled, however most of these courses are currently closed and indicate future dates to start again. In other cases, they are in a new phase of registration for the course. So, it would be very difficult to know exactly the number of people enrolled in the course.

Competing Interests: No competing interests were disclosed.

Reviewer Report 21 June 2021

<https://doi.org/10.5256/f1000research.55275.r85974>

© 2021 Al-Rahmi W. This is an open access peer review report distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Waleed Mugahed Al-Rahmi

School of Education, Faculty of Social Sciences and Humanities, Universiti Teknologi Malaysia, Johor Bahru, Malaysia

1. The aim of this research not clear. The authors should clarify the aims.
2. The research problems are not clear. Therefore, the authors should address the research gap

first, and I suggest adding new section to explain about the real problems.

3. I suggest adding research model, and test this model by Structural Equation Modeling (SEM), Why? Because we need to see the validation of theories applied in this research.

4. I suggest for authors to read and cite the following references:

- A. The use of Massive Open Online Courses (MOOCs) in blended learning courses and the functional value perceived by students
- B. Integrating innovation diffusion theory with technology acceptance model: Supporting students' attitude towards using a massive open online courses (MOOCs) systems.
- C. Massive Open Online Courses: enhancing caregiver education and support about dementia care towards and at end of life.
- D. Massive Open Online Courses (MOOCs): Data on Higher Education.
- E. Perceived user satisfaction and intention to use massive open online courses (MOOCs).
- F. Predicting user perceived satisfaction and reuse intentions toward Massive Open Online Courses (MOOCs) in the Covid-19 pandemic: An application of the UTAUT model and quality factors.

5. The research methodology is not clear, the authors should explain more and add some references.

6. The results analysis is not enough to show the research contributions. Therefore, the authors should add more analysis.

7. The authors should explain more what is the difference between this research with prior experimental results, and related research.

8. The authors should add new section about the limitations of this research, as well as what is the future research?

References

1. Feitosa de Moura V, Alexandre de Souza C, Noronha Viana A: The use of Massive Open Online Courses (MOOCs) in blended learning courses and the functional value perceived by students. *Computers & Education*. 2021; **161**. [Publisher Full Text](#)
2. Al-Rahmi W, Yahaya N, Alamri M, Alyoussef I, et al.: Integrating innovation diffusion theory with technology acceptance model: supporting students' attitude towards using a massive open online courses (MOOCs) systems. *Interactive Learning Environments*. 2019. 1-13 [Publisher Full Text](#)
3. Poole M, Davis N, Robinson L: Massive Open Online Courses: enhancing caregiver education and support about dementia care towards and at end of life. *Age and Ageing*. 2020; **49** (2): 171-174 [Publisher Full Text](#)
4. Al-Rahmi W, Aldraiweesh A, Yahaya N, Bin Kamin Y, et al.: Massive Open Online Courses (MOOCs): Data on higher education. *Data Brief*. 2019; **22**: 118-125 [PubMed Abstract](#) | [Publisher Full Text](#)
5. Pozón-López I, Higuera-Castillo E, Muñoz-Leiva F, Liébana-Cabanillas F: Perceived user satisfaction and intention to use massive open online courses (MOOCs). *Journal of Computing in Higher Education*. 2021; **33** (1): 85-120 [Publisher Full Text](#)
6. Wang Q, Khan M, Khan M: Predicting user perceived satisfaction and reuse intentions toward

Massive Open Online Courses (MOOCs) in the Covid-19 pandemic. *International Journal of Research in Business and Social Science* (2147- 4478). 2021; **10** (2): 1-11 [Publisher Full Text](#)

Is the work clearly and accurately presented and does it cite the current literature?

Partly

Is the study design appropriate and is the work technically sound?

Partly

Are sufficient details of methods and analysis provided to allow replication by others?

No

If applicable, is the statistical analysis and its interpretation appropriate?

No

Are all the source data underlying the results available to ensure full reproducibility?

No source data required

Are the conclusions drawn adequately supported by the results?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: computer and education

I confirm that I have read this submission and believe that I have an appropriate level of expertise to state that I do not consider it to be of an acceptable scientific standard, for reasons outlined above.

Author Response 12 May 2022

GANDY KERLIN GANDY KERLIN

Dear Waleed Mugahed Al-Rahmi

We are grateful for your comments. Our responses are described below.

1. The aim of this research not clear. The authors should clarify the aims.

Thank you for your comments. We had improved the description of the aims in the last paragraph.

2. The research problems are not clear. Therefore, the authors should address the research gap first, and I suggest adding new section to explain about the real problems.

We are grateful for your comments, so we have modified the introduction, reworded the justification of the study and included some additional references.

3. I suggest adding research model, and test this model by Structural Equation

Modeling (SEM), Why? Because we need to see the validation of theories applied in this research.

Your comment is interesting and would certainly enhance research aimed at assessing causality itself. Structural equation modeling (SEM) is a multivariate statistical technique for testing and estimating causal relationships from statistical data and qualitative assumptions about causality. On the other hand, our study is of cross-sectional design and we set out from the beginning to perform descriptive analysis using secondary information. Therefore, the use of structural equation modeling (SEM) is not part of our methodology.

4. I suggest for authors to read and cite the following references:

- A. The use of Massive Open Online Courses (MOOCs) in blended learning courses and the functional value perceived by students
- B. Integrating innovation diffusion theory with technology acceptance model: Supporting students' attitude towards using a massive open online courses (MOOCs) systems.
- C. Massive Open Online Courses: enhancing caregiver education and support about dementia care towards and at end of life.
- D. Massive Open Online Courses (MOOCs): Data on Higher Education.
- E. Perceived user satisfaction and intention to use massive open online courses (MOOCs).
- F. Predicting user perceived satisfaction and reuse intentions toward Massive Open Online Courses (MOOCs) in the Covid-19 pandemic: An application of the UTAUT model and quality factors.

Thank you for sharing these studies with us. We visualize that the studies focus on measures of effect on participants participating in massive open online courses (MOOCs). Therefore, we believe that our study aims to identify and describe MOOCs that provide health education, promotion and prevention opportunities for the general population during a COVID-19 pandemic. In this opportunity, we did not set out to learn about the results in the participants of this study.

5. The research methodology is not clear, the authors should explain more and add some references.

Thank you for your comment, we would like to know what part of the methodology is not clear to you. We would be happy to make modifications to make it more understandable for you.

6. The results analysis is not enough to show the research contributions. Therefore, the authors should add more analysis.

Thank you very much for your appreciation. We value more complex analyses such as multivariate statistical analyses in research. However, in this opportunity and due to the context of the pandemic, we thought it was convenient to carry out a research that would allow us to demonstrate the offer of courses related to health education focused on

prevention in a context where hospitals were not attending patients focused on disease prevention, given that the cases of COVID-19 were increasing.

7. The authors should explain more what is the difference between this research with prior experimental results, and related research.

Thank you for your comment. In the second paragraph of the discussion, we note many courses that are specialized and aimed at professionals. These courses were not included in our research as our objective is to describe the supply of courses available on health education (prevention and promotion), not disease treatment. We did not find previous research describing these types of courses on virtual platforms.

8. The authors should add new section about the limitations of this research, as well as what is the future research?

In the antepenultimate paragraph of the discussion, we describe our limitations for example the criteria for choosing a course were exclusively the decision of the researcher. Regarding future research, in the last paragraph of the discussion, we stated that future research should aim at assessing the quality of the content of these courses, as our research does not address this.

Competing Interests: No competing interests were disclosed.

The benefits of publishing with F1000Research:

- Your article is published within days, with no editorial bias
- You can publish traditional articles, null/negative results, case reports, data notes and more
- The peer review process is transparent and collaborative
- Your article is indexed in PubMed after passing peer review
- Dedicated customer support at every stage

For pre-submission enquiries, contact research@f1000.com

F1000Research