SYSTEMATIC REVIEW

Demystifying media sources of information and levels of knowledge about COVID-19: a rapid mini-review of cross-sectional studies in Africa [version 1; peer review: awaiting peer review]

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First published: 05 May 2021, 10:345
https://doi.org/10.12688/f1000research.51240.1
Latest published: 05 May 2021, 10:345
https://doi.org/10.12688/f1000research.51240.1

Abstract
COVID-19 control is highly affected by knowledge levels which are also affected by receipt of information on the disease. Therefore, this review examined knowledge levels and media sources of information findings of the studies on knowledge, attitudes, perceptions, and practices towards COVID-19 done in low- and middle-income countries in Africa to shed light on the interplay of the use of different media platforms and populations’ knowledge about the COVID-19 pandemic and identify shorter- and longer-term priorities for COVID-19 research to improve the continent’s capacity to not only deal with COVID-19 but also future pandemics. Searches were conducted in PubMed and CINAHL databases/sites with major terms being “knowledge”, “attitudes”, “perceptions”, “practices”, “COVID-19 “, and “Africa”. 319 were where identified and subjected to the exclusion and inclusion criteria retaining only 10 free, full-text research articles related to knowledge, attitudes, perceptions, and practices towards COVID-19. This review summarized the levels of knowledge and media information sources among African populations. The review indicated a largely higher level of knowledge towards COVID-19 among populations who received information through various media platforms and alluded to the different media platforms that could be appropriate to spread COVID-19 related information to African populations.

Keywords
COVID-19, Knowledge levels, Media information sources, Africa
This article is included in the Disease Outbreaks gateway.

This article is included in the Coronavirus collection.

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Author roles: Aruhomukama D: Conceptualization, Methodology, Writing – Original Draft Preparation, Writing – Review & Editing; Bulafu D: Conceptualization, Formal Analysis, Methodology, Visualization, 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.

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How to cite this article: Aruhomukama D and Bulafu D. Demystifying media sources of information and levels of knowledge about COVID-19: a rapid mini-review of cross-sectional studies in Africa [version 1; peer review: awaiting peer review] F1000Research 2021, 10:345 https://doi.org/10.12688/f1000research.51240.1

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Introduction
The 2019 novel coronavirus disease (COVID-19) is a communicable respiratory disease caused by a novel strain of coronavirus, the Severe Acute Respiratory Syndrome-Coronavirus-2 (SARS-CoV-2). 1-4 COVID-19 was first identified in Wuhan, Hubei Province of China at the end of 2019 and was later declared a pandemic on the 11th of March 2020, underscoring the disease’s high contagion potential, and exponential global rise. 1-4

At the start of the pandemic, scholars had predicted that over 16.3 million people in Africa could have contracted COVID-19 by 30th June 2020. 5 These predictions had been attributed to Africa’s rather weak health service infrastructure and low clinician to population ratio, 6 limited laboratory capacity, 7 and a higher rate of underlying conditions including malnutrition, anemia, HIV/AIDS, and chronic respiratory conditions due to tuberculosis and air pollution. 8

Despite Africa’s vulnerabilities, at the time of writing (i.e. 14:30 East African Time (EAT) on the 11th of November 2020), only 45/54 African countries had been hit by COVID-19 with only 1.3 million cumulative cases and 24,464 deaths. 9 This could be attributed to the high levels of knowledge, 10-12 positive attitudes and perceptions, 11,12 and good practices towards COVID-19 10,13-15 among the African people, as good knowledge, attitudes, perceptions, and practices have been reported to positively influence disease prevention as well as health promotion. 16,17

Many African countries put up stringent measures such as: instigating institutional and self-quarantines, restricted access to borders, closure of learning institutions, banning public transport and gatherings, among others to curb COVID-19. 13 It is worth noting that for such measures to be effective, there should be public adherence which is affected by people’s levels of knowledge, which in turn influences their attitudes, perceptions, and practices. 18,19

Scholars have also revealed that knowledge towards infectious diseases could be associated with serious panic alongside emotional reactions among people, which could hinder measures to curb the COVID-19 pandemic. 20,21 These involve a range of opinions about the causes of the disease and exacerbating factors, identification of symptoms, and available methods of treatments and consequences that could determine different behaviors and preventive measures. 22,23 Therefore, low levels of knowledge, towards COVID-19 and its preventive measures could be potential barriers in controlling the pandemic. 17,22

Although various studies on knowledge towards COVID-19 have been completed, 13,24,25 no review has been pursued to interrogate and integrate the findings of these studies with regards to the levels of knowledge about COVID-19 and media sources of information about the same in low and middle-income countries in Africa.

Pursuing such a review would allow the: (i) deeper understanding of how the use of different media platforms affects knowledge which could constitute an important component for the implementation of COVID-19 prevention and control measures at both national and sub-national levels, (ii) identification of shorter- and longer-term priorities for COVID-19 research on the continent, and (iii) development of an agenda for both shorter- and longer-term priorities to help build Africa’s capacity to deal with future pandemics.

Hence, the objective of this review was to interrogate and integrate knowledge levels and media sources of information findings of the studies on knowledge, attitudes, perceptions, and practices towards COVID-19 done in low and middle-income countries in Africa to shed light on the interplay of the use of different media platforms and populations’ knowledge about the COVID-19 pandemic and identify shorter- and longer-term priorities for COVID-19 research which when pursued could improve the continent’s capacity to not only deal with COVID-19 but also future pandemics.

Methods
Eligibility criteria
Studies that were included fitted the criteria below:

1. **Population:** African population
2. **Intervention/Exposure of interest:** Corona Virus Disease 2019
3. **Comparison:** N/A
4. **Outcome:** Knowledge, attitudes, practices, perception
5. **Study design:** Cross Sectional studies
6. **Study period;** January 2019 to October 2020

7. **Language;** English

Furthermore, studies that were not available in English, all other studies other than cross-sectional studies, studies not related to knowledge on COVID-19 will be excluded from the study. A protocol was not registered for this study.

**Information sources and literature search**

A literature search was conducted in from January 2019 to October 2020 (time of last search) on PubMed and CINAHL databases/sites with major terms being “knowledge”, “attitudes”, “perceptions”, “practices”, “COVID-19 “, and “Africa”. The search yielded a total of 305 articles at initial search in PubMed and 14 articles in CINAHL.

**Search string:** (((practices) OR (attitudes) OR (knowledge) OR (perceptions)) AND (Africa)) AND COVID-19.

**Study selection**

The articles were moved to endnote where reviewers, DB and DA, screened articles basing on titles and abstracts. During this process; duplicates, systematic reviews, opinions, letters to editors, perspectives, and articles related to COVID-19 but not related to knowledge, attitudes, perceptions, and practices towards COVID-19 were removed, retaining only free, full-text research articles related to knowledge, attitudes, perceptions, and practices towards COVID-19 conducted among African countries, which were then considered for this review (Figure 1).

**Data collection process and data items**

An extraction sheet was created in Microsoft word. One independent reviewer (DB) extracted the data and entries were checked by the second reviewer (DA). This extraction form included; study number, authors, study designs, country, respondents, number of respondents, and data collection tools.

**Risk of Bias assessment**

In this review, two researchers (DB and DA) independently assessed the potential bias of the studies. Also, the Joana Briggs Institute Prevalence Critical Appraisal Tool, which is used for systematic reviews of prevalence studies, was used to assess the risk of bias in the studies [1]. Sample representativeness, sampling method, sample size, study participants, sites and settings, coverage of the identified sample, and appropriateness of the statistical analysis were evaluated in all included studies. Grading of Recommendations Assessment and Development Evaluation (GRADE) was used to assess the quality of evidence of the studies. Methodological quality, directness of the evidence, heterogeneity of data, and risk of publication bias were considered in the criteria. The outcomes were graded as low, moderate and high.

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**Figure 1. Flow chart of literature search.**

PubMed    n = 305

CINAHL    n = 14

Excluded (duplicates, systematic reviews, opinions, perspectives, letters to editors, and articles related to COVID-19 but not related to knowledge, attitudes, perceptions, and practices towards COVID-19)  

n = 309

Studies related to KAP on COVID-19    n = 10
Results

Study selection

The initial literature search resulted into 319 articles (305 articles from PubMed and 14 articles from CINAHL). During the screening process, 309 articles did not meet the inclusion criteria and were excluded leaving 10 cross-sectional studies as shown in Figure 1.

Study characteristics

10 studies related to knowledge, attitudes, perceptions, and practices towards COVID-19 in African countries i.e., Egypt, Cameroon, Uganda, Nigeria, Libya, the Democratic Republic of Congo, Ethiopia, and Sierra Leone were reviewed. Only four of the studies used self-administered questionnaires while six studies used online forms to collect data during the pandemic. The respondents/participants in these studies included: the public/communities, medical students and lecturers, and health-care workers. The total number of respondents/participants involved in the studies were 8,013 (Table 1).

Risk of Bias of Studies

The Joana Briggs Institute Prevalence Critical Appraisal Tool, which is used for systematic reviews of prevalence studies, was used to assess the risk of bias in the studies. All the studies had a low risk of bias in terms of Sample representativeness, Methodological quality, coverage of the identified sample, and appropriateness of the statistical analysis, and risk of publication bias. Results of the GRADE analysis are available on Figshare.68

Table 1. Characteristics of the reviewed studies.

<table>
<thead>
<tr>
<th>No.</th>
<th>Authors</th>
<th>Type of study</th>
<th>Country</th>
<th>Respondents/Participants</th>
<th>Number of Respondents/participants</th>
<th>Tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Abdelhafiz et al., 2020&lt;sup&gt;26&lt;/sup&gt;</td>
<td>Cross-sectional</td>
<td>Egypt</td>
<td>Community</td>
<td>559</td>
<td>Online survey</td>
</tr>
<tr>
<td>2</td>
<td>Adela et al., 2020&lt;sup&gt;10&lt;/sup&gt;</td>
<td>Cross-sectional</td>
<td>Cameroon</td>
<td>Community/Public</td>
<td>1006</td>
<td>Online survey</td>
</tr>
<tr>
<td>3</td>
<td>Aruhamukama et al., 2020&lt;sup&gt;13&lt;/sup&gt;</td>
<td>Cross-sectional</td>
<td>Uganda</td>
<td>Community</td>
<td>644</td>
<td>Interviewer-administered questionnaire</td>
</tr>
<tr>
<td>4</td>
<td>Echoru et al., 2020&lt;sup&gt;14&lt;/sup&gt;</td>
<td>Cross-sectional</td>
<td>Uganda</td>
<td>Medical students and lecturers</td>
<td>103</td>
<td>Online survey</td>
</tr>
<tr>
<td>5</td>
<td>Elhadi et al., 2020&lt;sup&gt;27&lt;/sup&gt;</td>
<td>Cross-sectional</td>
<td>Libya</td>
<td>Health-care workers</td>
<td>1572</td>
<td>Self-administered paper-based questionnaire</td>
</tr>
<tr>
<td>6</td>
<td>Hager et al., 2020&lt;sup&gt;11&lt;/sup&gt;</td>
<td>Cross-sectional</td>
<td>Egypt and Nigeria</td>
<td>Community/Public</td>
<td>1437</td>
<td>Online survey</td>
</tr>
<tr>
<td>7</td>
<td>Kebede et al., 2020&lt;sup&gt;24&lt;/sup&gt;</td>
<td>Cross-sectional</td>
<td>Ethiopia</td>
<td>Medical facility visitors</td>
<td>247</td>
<td>Self-administered questionnaire</td>
</tr>
<tr>
<td>8</td>
<td>Lee et al., 2020&lt;sup&gt;28&lt;/sup&gt;</td>
<td>Cross-sectional</td>
<td>Ethiopia and the Democratic Republic of Congo (DRC)</td>
<td>Community</td>
<td>Ethiopia = 175 DRC = 273</td>
<td>Online survey</td>
</tr>
<tr>
<td>9</td>
<td>Olum et al., 2020&lt;sup&gt;12&lt;/sup&gt;</td>
<td>Cross-sectional</td>
<td>Uganda</td>
<td>Medical students</td>
<td>741</td>
<td>Online survey</td>
</tr>
<tr>
<td>10</td>
<td>Sengeh et al., 2020&lt;sup&gt;15&lt;/sup&gt;</td>
<td>Cross-sectional</td>
<td>Sierra Leone</td>
<td>Public/Community</td>
<td>1253</td>
<td>Self-administered questionnaire</td>
</tr>
<tr>
<td></td>
<td><strong>Total number of participants</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>n=8013</strong></td>
<td></td>
</tr>
</tbody>
</table>
Media sources of information and levels of knowledge about COVID-19.

10 studies featured results on knowledge with regards to COVID-19 among the: public/communities, medical students and lecturers, and health-care workers (Table 2).

Four studies reported that nearly all of the respondents/participants had heard about COVID-19. Furthermore, three studies reported that respondents/participants had adequate knowledge of COVID-19 while one study reported that respondents/participants had inadequate knowledge of COVID-19.

Respondents/participants in four studies reported that social media platforms, for example, WhatsApp, Twitter and Facebook, local television and radio stations, and other internet platforms largely organizational websites were their major sources of information with regards to COVID-19. Respondents/participants in two studies also reported having received information with regards to COVID-19 from their family members, friends as well as places of worship, for example mosques and churches (Table 2).

Table 2. Media sources of information and levels of knowledge about COVID-19.

<table>
<thead>
<tr>
<th>No.</th>
<th>Authors</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Abdelhafiz et al., 2020</td>
<td>All, 100% of the participants reported having heard about COVID-19. The commonest reported sources of information about the disease were social media, 66.9%, the internet, 58.3%, and TV or satellite channels, 52.6%.</td>
</tr>
<tr>
<td>2</td>
<td>Adela et al., 2020</td>
<td>The majority, 84.19% of the respondents were reported to have had high knowledge scores of 4–7 regarding the modes of transmission of COVID-19. More than half, 54.5% reported having obtained information about the disease for the first time via television during the first and last 15 days of the study. The respondents also reported having obtained information about the disease through WhatsApp, 15.6%, and websites, 16.1%.</td>
</tr>
<tr>
<td>3</td>
<td>Aruhomukama et al., 2020</td>
<td>Nearly all, 99.7% of the participants reported having heard about COVID-19. The majority of the participants, 80.6% reported having heard and/or seen the messages on local television stations. Other sources of information about COVID-19 reported by the participants included: local radio stations, 64.3%, family and friends, 14.7%, local newspapers, 15.6%, social media platforms, 29.5%, and other internet platforms, 5.8%.</td>
</tr>
<tr>
<td>4</td>
<td>Echoru et al., 2020</td>
<td>Most lecturers, 96%, and students, 92.5% reported that they knew about COVID-19 and its modes of transmission.</td>
</tr>
<tr>
<td>5</td>
<td>Elhadi et al., 2020</td>
<td>The majority, 73.5% of the participants reported that they had inadequate knowledge about COVID-19.</td>
</tr>
<tr>
<td>6</td>
<td>Hager et al., 2020</td>
<td>Most of the respondents, 61.6% reported that they had satisfactory knowledge about COVID-19. The respondents also reported that the internet as their main source of information about the disease.</td>
</tr>
<tr>
<td>7</td>
<td>Kebede et al., 2020</td>
<td>A high proportion, 95.1% of the visitors reported that they knew about COVID-19 and its modes of transmission.</td>
</tr>
<tr>
<td>8</td>
<td>Lee et al., 2020</td>
<td>The majority of the participants, 97.7% in Ethiopia, and 99.5% in DRC reported that they knew about COVID-19 and its modes of transmission. The percentages of respondents with knowledge of COVID-19 modes of transmission by droplets were 98.8% in Ethiopia, and 94.9% in DRC. While about 48.1% of respondents in Ethiopia and 63.4% in DRC knew about airborne transmission. Those with knowledge of COVID-19 transmission via contaminated objects were 98.3% in Ethiopia, 93.4% in DRC.</td>
</tr>
<tr>
<td>9</td>
<td>Olum et al., 2020</td>
<td>The mean knowledge score of the participants was 13.1 (SD 1.2) indicating a good overall knowledge among medical students. The majority of medical students identified fever, cough, and difficulty in breathing as the main clinical symptoms of COVID-19 (95%, 85%, and 88%, respectively).</td>
</tr>
<tr>
<td>10</td>
<td>Sengeh et al., 2020</td>
<td>The majority, 91% of the participants reported that they had heard about COVID-19. The commonest reported sources of information about the disease were social media, 39%, radio, 73%, and churches/mosques, 24%. The majority of the participants mentioned body fluids, 74%, air, 61%, and touching, 66% infected persons or surfaces as the commonest modes of transmission of the disease.</td>
</tr>
</tbody>
</table>
Discussion

To the best of our knowledge, this is the first review of the levels of knowledge and media information sources about COVID-19 in Africa. This review identified shorter- and longer-term priorities for COVID-19 research on the continent, which when pursued could potentially improve the continent’s capacity to not only efficiently and effectively deal with COVID-19 but also future pandemics.

Similar to related studies, the high levels of knowledge about COVID-19 in some of the reviewed studies could be attributed to the seriousness of the disease in addition to the daily updates from public health agencies in the respective countries which could have positively influenced the respondents/participants need to learn and acquire knowledge about the disease.11,29 and the role of the different media platforms especially social media in explaining the basics about the disease.29–33

While high knowledge levels have been documented to positively influence populations’ adherence to infection control and prevention measures,25,28 indifferent adherence to untrue and gullible beliefs by populations have been documented to habitually arise due to inadequate knowledge and inaccurate information, which could further affect the readiness levels as well as proper implementation of infection prevention and control measures at both the national or sub-national levels.25,29 Although social media platforms offer opportunities for specialists to speedily convey accurate information, they also offer other non-specialists opportunities to counter this with the spread of misinformation and exacerbating outrage.34,35 In concert, hazard and outrage along with socio-cultural and economic context shape adherence to, as well as the overall acceptance of, infection prevention and control measures.34–36

Studies similar to those reviewed have reported the common use of social media platforms largely by the young adults and more educated attributing this to their understanding of the English language,29,37,38 while others have shown that social media platforms are also largely used by those having upper and middle socio-economic status,29,30 and urban and sub-urban dwellers40 who own smartphones and can easily access the internet or afford mobile data and as a result, the reviewed studies could have excluded the older adults, uneducated, those having low social-economic status, and rural dwellers.29 Unlike a study on smartphone internet access and use in the United States41 that reported the dependency on smartphones by similar groups of people (i.e. the uneducated and those having low social-economic status), the same study41 however, showed that the individuals with high and middle-income status use smartphones and the internet as sources of news and/or information. Indeed, the findings of the reviewed studies indicate that smartphones could potentially be acting as barriers for disadvantaged groups to overcome the digital divide.

Also, unlike the findings of another study on political attitudes and demographics of British social media users that reported no statistically significant differences between social media users and non-social media users after controlling for age, gender, and education,42 similar studies on the utilization of social media for health-related purposes in low- and middle-income countries in Africa have reported otherwise.11,29,37,38 Above and beyond, the utilization of social media platforms for health-related purposes in low- and middle-income countries in Africa has been reported to be on the increase.37,38,43

With the projected rise in smartphone ownership and internet usage in low- and middle-income countries in Africa,44 the findings of the reviewed studies implore the use of social media platforms as tools to wisely, prudently, and speedily spread the constantly changing information about COVID-19. Social media platforms when used as tools could serve to change people’s behavior as well as to promote the well-being of individuals and public health. Despite this, the role of social media in shaping knowledge, attitudes, perceptions, and practices should be carefully studied to increase compliance with infection prevention and control measures at both the national or sub-national levels. Also, the understanding of varying opinions and concerns of different demographic groups could be done to enable public health officials to design and implement on-target response strategies. In a similar light, research is needed to expand the geographical focus and test strategies to facilitate the efficient and effective use of social media for health-related purposes in low- and middle-income countries in Africa.

Also, the role of public health officials should be applauded and fortified, while a framework to improve the public health emergency preparedness system is pursued to encourage a focused conversation to improve preparedness for the benefit of individuals, families, communities, and societies.

The low levels of knowledge about COVID-19 reported in the reviewed studies could be attributed to several factors reported in related studies including misinformation powered by rumors, stigma, and several conspiracy beliefs about the disease.29–33
disease. low levels of education in most of the populations in the African countries in which the studies were pursued, lack of access to information as well as health services, low perceived risk of acquiring the disease, and other gaps in socio-demographic groupings among the populations, for example age and socio-economic groupings.

Misinformation related to COVID-19 has been reported to be gaining considerable popularity and playing a role in augmenting the disease’s threat through encouraging its continuous global spread. Also, misinformation can negatively impact individuals’, communities’, and societies’ actions, and devalue infection prevention and control measures employed at both the national or sub-national levels. Misinformation has also been documented to potentially have serious negative implications not only on individuals and communities but also societies particularly if prioritized over scientifically proven guidelines. Maintaining effective information governance across the general public to substitute any misinformation related to the disease especially in Africa has been recommended even though falsehoods on various media platforms have been predicted to continue surging high as long as the disease lingers on. The findings of the reviewed studies sustain the suggestions that regular prompts on the concept of accuracy by several mass media and behaviors driven by habit and/or addiction. Through the evaluation of the same campaigns in the context of various campaigns recurrently competing with several factors such as prevailing social norms, persistent merchandise marketing, and that most of the information accessed mainly through radio, television, and traditional or non-digital newspapers, as well as face to face communication. These studies further revealed that the choice of information sources was majorly influenced by among other factors the levels of education, income, as well as the occupation of their respondents.

The same assertion is supported by the findings of related studies that investigated sources of COVID-19 related information that revealed that populations constituting of mainly the older adults, unemployed or those mainly employed in the informal sector, uneducated, and rural and semi-urban dwellers have limited or poor knowledge which could be associated with negative attitudes, perceptions, and practices towards COVID-19. The findings of the reviewed studies could enhance the recommendations previously made by several related studies that knowledge, attitude, and practices towards COVID-19 studies be pursued especially in the underprivileged and vulnerable groups especially as the COVID-19 pandemic lingers on.

Although exposure to messages through mass media campaigns has been described as largely passive, with such campaigns recurrently competing with several factors such as prevailing social norms, persistent merchandise marketing, and behaviors driven by habit and/or addiction. Through the evaluation of the same campaigns in the context of various health risk behaviors, mass media campaigns have been documented to have the potential to positively influence health-related behavior, particularly across large populations. The findings of this study in the context of the reviewed studies hence suggest that mass media campaigns could be leveraged to spread COVID-19 related information and that investments in longer and better-funded mass media campaigns to achieve adequate population exposure to media messages should be done.

With regards to face-to-face communication, several avenues have been identified through studies related to those reviewed including the utilization of small and regulated meetings of different religious faiths and music concerts, engaging community health workers in spreading COVID-19 related messages in their communities as well as encouraging interpersonal communication in families aimed at spreading information about COVID-19. Communication of health-related themes through music has been recognized to foster a culture-centered approach that considers community participation concerning broader social and organizational issues as compared to individual-focused behavior change communication. Also, communication of health-related themes through music has been reported to have the potential to bridge and build trust between health care workers particularly community health care workers, and target communities while facilitating information dissemination as well as stimulating public debate regarding sensitive health-related themes.
Conclusion
This review largely indicates higher levels of knowledge about COVID-19 among populations in low- and middle-income settings in Africa that had received information about the same via several media platforms. In populations with lower levels of knowledge about COVID-19, this review alludes to the different media platforms that could be appropriate to spread COVID-19 related information to the same populations. The ability of health care agencies to communicate COVID-19 related messages while leveraging appropriate media platforms can play a critical role in easing the shorter- and longer-term impacts of the COVID-19 pandemic in low- and middle-income settings in Africa.

Data availability
Underlying data
All data underlying the results are available as part of the article and no additional source data are required.

Extended data

Reporting guidelines

Data are available under the terms of the Creative Commons Attribution 4.0 International license (CC-BY 4.0).

Competing interests
No competing interests were disclosed.

Grant information
The authors declared that no grants were involved in supporting this work.

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