Acceptability of contact management and care of simple cases of COVID-19 at home: a cross-sectional study in Senegal

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Background: COVID-19 is a major public health problem. In mid-2020, due to the health system challenges from increased COVID-19 cases, the Ministry of Health and Social Action in Senegal opted for contact management and care of simple cases at home. The objective of the study was to determine the acceptability of contact and simple case management of COVID-19 at home and its associated factors in Senegal.

Methods: This was a descriptive and analytical cross-sectional study. We collected data from 11 June to 10 July 2020. We used a marginal quota sampling strategy. A total of 813 individuals took part in the survey. We collected data using a telephone interview.

Results: The care of simple cases of COVID-19 at home was well accepted (78.5%). The use of home contact management was less accepted (51.4%). Knowledge of the modes of transmission of the virus and confidence in institutional information were associated with the acceptability of home care for simple cases. Regularly searching for information on COVID-19 and confidence in the government's control of the epidemic were associated with the acceptability of managing contacts at home.

Conclusions: Authorities should take these factors into account for better communication to improve the acceptability and confidence in home-based care for COVID-19 and future epidemics.

Keywords: case management, COVID-19, home care services, Senegal, telephone

Introduction

COVID-19 is now a major public health problem. To interrupt the chains of transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the causative agent of COVID-19, non-pharmaceutical measures such as case detection, case management in dedicated centres[1] and screening and quarantine of contacts have been proposed.[2] These measures aim to prevent the further transmission of secondary infections. They have been used successfully to prevent further outbreaks in South Korea.[2]

In Senegal, as soon as the first case of COVID-19 appeared on 2 March 2020, the authorities put a national multisectoral action plan into place for monitoring and response.[3] The government accompanied this plan with measures such as border closures, curfews, bans on movement between regions, closure of places of worship and closure of markets.[4,5] They established epidemiological treatment centres (ETCs) in all regions to manage COVID-19 cases. On 22 March 2020 they began to isolate contacts in hotel facilities.[5]

Despite the unprecedented national measures taken, COVID-19 cases continued to increase (Figure 1),[6,7] leading to an increase in the number of contacts requiring follow-up.

Faced with this increase and the saturation of the health system and hotels to take care of patients and contacts, respectively, on 15 May 2020, the authorities decided to stop monitoring contacts in hotels and care of simple cases in the ETCs. For the care of simple cases of COVID-19, they first adopted an extra-hospital care policy (dedicated sites outside the ETCs like hotels) at the end of April 2020[8] then a home care policy in July 2020 with protocol to be respected.[9] A simple case is defined as a
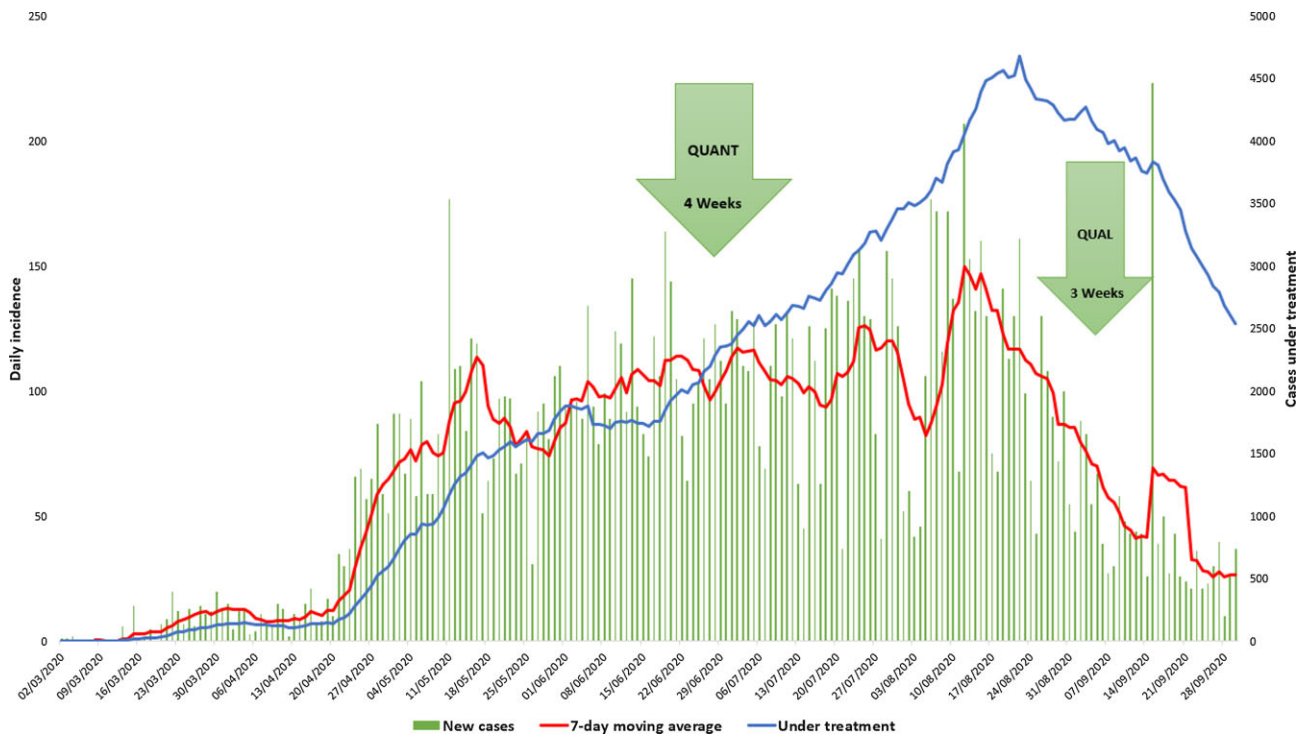
Figure 1. Epidemic curve of COVID-19 confirmed cases (https://www.covid19afrique.com).

patient confirmed as COVID-19 who presents signs of uncomplicated upper respiratory tract infection such as fatigue, cough (with or without phlegm), nausea or vomiting, muscle pain, sore throat, nasal congestion, headache, ageusia (loss of taste) and anosmia (loss of smell).[9] A contact is defined as a person (including caregivers and health workers) who has been exposed to individuals with suspected COVID-19 disease; they are advised to monitor their health for 14 d from the last day of contact.[10]

The recent SARS and Ebola epidemics used home-based management approaches.[11] However, there are some risks associated with this strategy, including the spread of the virus within households and, in the community,[1] social stigma,[12] which undermines these measures' potential effectiveness. Several countries and the WHO have developed guidelines for the home management of COVID cases.[10,13–15] Indeed, the vast majority of patients infected with COVID-19 develop a benign disease.[16] A few studies have shown that the ideal way to control the COVID-19 pandemic is to isolate patients in health facilities with appropriate respiratory precautions, contact tracing and barrier measures.[17–19] However, isolation in health facilities would result in a shortage of beds for other patients.[15] In this context, home-based management (a familiar environment with family support) is necessary and could help to overcome psychological problems.[20] However, to our knowledge, these guidelines and studies on the subject have not addressed the social acceptability of these measures. Thus, our objective was to determine the acceptability of contact and simple case management of COVID-19 at home and its associated factors in Senegal.

Methods

Study setting

The study took place in the 14 regions of Senegal. The average age in Senegal is 19 y and males make up 49.7% of the population.[21] The number of confirmed COVID-19 cases on the day the survey started (11 June 2020) was 4759 (of which 1709 were under treatment)[7] with 76.5% of cases in the Dakar region. The organisation of the socio-sanitary sector is pyramidal (central, intermediate and peripheral levels), based on administrative divisions.[22] There are 20 ETCs in all regions of Senegal.[23] They have a capacity of 800 inpatient beds[24] and 80 beds for resuscitation and respirators were available in May throughout the country.[25] In Senegal, the mobile penetration rate is >110%, with users often having two or even three different SIM cards with several operators.[26]

Research estimates, period and study population

This was a descriptive and analytical cross-sectional study.[27] We collected data from 11 June to 10 July 2020. The study population consisted of people aged ≥18 y in the general population with a mobile phone number.

Sampling

The quantitative study used a marginal quota sampling strategy.[28] This method is relevant in emergency situations such as

Table 1. Definition of independent variables

Variables	Definitions
Regularly search for information on COVID-19	Yes=Yes, absolutely; Yes, rather Yes=Yes, absolutely; Yes, rather No/NSP=No, not at all; No, rather not; I don't know
Confidence in information sources	Yes=Yes, absolutely; Yes, rather No/NSP=No, not at all; No, rather not; I don't know
Knowledge about the cause of COVID-19	Good=virus Wrong=Other answers
Knowledge about the signs of the disease	Good=When the respondent had cited 3 signs of the disease Bad=When the respondent had cited <3 signs of the disease
Knowledge of the modes of transmission of the virus	Good=When the respondent had cited $\geq$2 modes of transmission of the virus Bad=When the respondent had cited <2 modes of transmission of the virus
Belief in the existence of treatment	Yes=Yes, absolutely; Yes, rather No/NSP=No, not at all; No, rather not; I don't know
Psychosocial well-being	The WHO's 5-item index of well-being is a subjective measure of the positive dimensions of mental health. The 5 items ask about how people felt in the last 2 wk and included: 'I felt good and in good spirits', 'I felt calm and quiet', 'I felt energetic and vigorous', 'I woke up feeling fresh and refreshed' and 'My daily life was full of interesting things'. Six response modalities: all the time rated 5, most of the time 4, more than half of the time 3, less than half of the time 2, occasionally 1 and never 0. An overall score is obtained by adding up the responses to the 5 items and ranges from 0 to 25. Well-being was considered good when the respondent had a score of $\geq$13.
Acceptability of the 4 government measures	To deal with the pandemic, the Senegalese government had taken measures against the population, including curfews, travel bans and the closure of markets and places of worship. Each of these measures was measured by 7 items, which gave us a score ranging from 0 to 7. A measure was considered to be respected when the respondent had a score of $\geq$6. Compliance with a measure was coded as 1 and non-compliance as 0. A respondent was considered to accept all 4 measures when they scored 1 in all 4 measures.

the COVID-19 pandemic with sample sizes of <3000.[28,29] To have a representative sample of the population, we carried out stratification by population weight by region, gender and age group. We randomly generated a nine-digit telephone number list from mobile telephone numbers attributable to Senegal using the random digit dialling method. We integrated this list into a reactive auto dialler to trigger calls automatically and optimally. A total of 813 individuals took part in the quantitative survey. The procedure for arriving at the final sample has been described in another article.[30]

Data collection

Five interviewers speaking six languages (French, Diola, Wolof, Sérére, Pulaar and Soninké) collected the quantitative data using a structured and closed questionnaire. The interviewers conducted the survey by telephone. They used tablets equipped with Open Data Kit software (Get ODK, San Diego, California, USA) to administer the questionnaire.[31,32]

The final version of the questionnaire was first tested during the training of the interviewers then was validated by the team members after several corrections.

We conceptualised the collected variables in accordance with Bruchon-Schweitzer's integrative and multifactorial model.[33] This model has good content validity for this study as it integrates most of the variables identified in the literature review. According to the model, we divided the factors in our study into three groups: situational, dispositional and transactional.

Situational factors are sociodemographic characteristics such as age, gender, region, education level, marital status and economic well-being score. Dispositional factors are knowledge about the cause of the disease, symptoms, modes of transmission and availability of treatment and other variables such as trust in government, information seeking and trust in different information sources (institutions, national media, social networks, health professionals and other applications). Transactional factors are concerns about the epidemic and psychosocial well-being.[34] The independent variables are defined in Table 1.

We measured the acceptability (the dependent variable) using a five-point Likert scale (strongly agree=5 to not at all agree=1).

Table 2. Participants' characteristics (N=813)

Variable	n (%)
Gender	
Female	369 (45.4%)
Male	444 (54.6%)
Region	
Dakar	247 (30.4%)
Outside Dakar	566 (69.6%)
Level of education	
Uneducated	346 (42.6%)
Primary	154 (18.9%)
Secondary/higher	313 (38.5%)
Marital status	
Married	499 (61.4%)
Unmarried	314 (38.6%)
Economic well-being score	
Poor	229 (28.2%)
Medium	165 (20.3%)
Rich	419 (51.5%)

It was transformed into binary variables (Yes=Strongly agree and Agree) to determine acceptability levels and identify associated factors.

Data analysis

The quantitative analyses were carried out using R software version 4.0.2. The quantitative variables are described through the mean with its SD and the qualitative variables through the frequencies. We used the Student's test to compare mean ages, and the χ^2 test to compare other characteristics with a 5% alpha risk. We used binomial logistic regression in the multivariate analysis. We ran two models to determine the factors associated with the acceptability of management of home contacts (model 1) and those associated with care of simple home cases (model 2). We included all variables with p<0.25 in the original models.[35] We used the step-by-step top-down selection procedure in each model to construct the final model. We individually removed variables that did not improve the model. We used the likelihood ratio test to compare nested models.[36] We used this multivariate analysis to determine adjusted ORs (ORajs).

Results

The average age of the respondents was 34.70±14.20 y. Males represented 54.6%. In our study, the proportion of individuals who lived in the capital was 30.4%. The proportion of people who had no education was 42.6%. Those with secondary/university education was 38.5%. Married people were in the majority with a proportion of 30.4% (Table 2).

The proportion of participants who accepted care for simple COVID-19 cases at home was 78.5%. Furthermore, 48.6% of the participants did not accept the management of COVID-19 contacts at home.

The proportion of acceptability of management for home contacts among participants with a good knowledge of the modes of transmission of the virus was 56.1%, while for those with poor knowledge it was 39.0% (p<0.001). The proportion of acceptability of care of simple cases at home among participants who believed that treatment was available was 85.5%, while that of others was 74.8% (p=0.001) (Table 3).

Table 4 shows that the acceptability of management for home-based contacts could be based on trust in the government to fight the epidemic (ORaj: 1.51 [95% CI 1.10 to 2.08]), knowledge about the modes of transmission of the virus (ORaj: 1.77 [95% CI 1.27 to 2.48]), concern about the epidemic (ORaj: 0.68 [95% CI 0.50 to 0.93]) and regularly searching for information on COVID-19 (ORaj: 2.39 [95% CI 1.76 to 3.26]).

The acceptability of care of simple cases at home could be predicted by knowledge of the modes of transmission of the virus (ORaj: 1.55 [95% CI: 1.04 to 2.28]), regular research of information on COVID-19 (ORaj: 2.12 [95% CI 1.45 to 3.12]), wealth based on the score of economic well-being compared with poverty (ORaj: 0.46 [95% CI 0.29 to 0.72]), belief in the existence of treatment (ORaj: 1.82 [95% CI 1.19 to 2.83]) and trust in institutional information (ORaj: 2.10 [95% CI 1.43 to 3.10]).

Discussion

The current study found that while respondents supported care for simple cases of COVID-19 at home, they were more cautious about management for home contacts. These results are interesting given the adoption of this strategy by the Ministry of Health and Social Action (MoHSA).[37] These results can be justified by the fact that the participants are concerned about health system overload, and accept their care at the community level. However, participants are more divided on the management of contacts. The WHO recommends isolation of contacts for 14 d after the last exposure to a confirmed case.[2] During the Ebola epidemic, this isolation period was 21 d.[38] A British survey revealed that only 10.9% of contacts adhere to quarantine and 18.2% adhere to self-isolation.[39] Some of the factors preventing adherence to the isolation may be related to social and financial charges.[40] The 14 d for COVID-19 are difficult to enforce as they take place in the home, and may expose the community to transmission of the virus if people do not isolate themselves. Thus, these results can be explained by the unknown status of these contacts, who may be asymptomatic then transmit the disease. The experience of the Ebola epidemic in Senegal had shown a negative perception of risk around contacts because people considered them infected with the virus.[38] In addition to strengthening the monitoring of household contacts, efforts should be made to increase people's understanding of these measures through public health counselling, explaining the importance of management of household contacts to reduce transmission and strong local and social support networks to raise awareness.[41]

The study in Senegal found that individuals who trusted institutional sources were more likely to accept care of simple cases at home. Similarly, trust in government in the fight against the epidemic was positively associated with the acceptability of management for home-based contacts. This finding is similar to the study in Israel and China,[42] which showed that trust in

Table 3. Breakdown of respondents by characteristics and acceptability of home-based care (N=813)

Variable	N (% acceptability of management of home contacts)	p	N (% acceptability of care for simple cases at home)	p
Age (μ±σ)	35.5 (14.2)	0.097	34.6 (14.1)	0.653
Gender		0.754		0.854
Female	369 (50.7%)		369 (78.0%)	
Male	444 (52.0%)		444 (78.8%)	
Level of education		0.594		0.056
Uneducated	346 (50.0%)		346 (74.6%)	
Primary	154 (50.0%)		154 (79.9%)	
Secondary/higher	313 (53.7%)		313 (82.1%)	
Region		0.492		0.155
Outside Dakar	566 (50.5%)		566 (77.0%)	
Dakar	247 (53.4%)		247 (81.8%)	
Marital status		1.000		0.588
Unmarried	314 (51.3%)		314 (79.6%)	
Married	499 (51.5%)		499 (77.8%)	
Economic well-being score		0.570		**0.035**
Poor	229 (53.7%)		229 (83.8%)	
Medium	165 (52.7%)		165 (79.4%)	
Rich	419 (49.6%)		419 (75.2%)	
Confidence in the government to fight the epidemic		0.081		0.309
No	524 (49.0%)		524 (77.3%)	
Yes	289 (55.7%)		289 (80.6%)	
Regular search for information on COVID-19		**<0.001**		**<0.001**
No/NSP	290 (35.2%)		290 (66.2%)	
Yes	523 (60.4%)		523 (85.3%)	
Confidence in institutional information		**0.004**		**<0.001**
No/NSP	352 (45.5%)		352 (69.6%)	
Yes	461 (56.0%)		461 (85.2%)	
Confidence in national media information		0.355		0.088
No/NSP	135 (47.4%)		135 (72.6%)	
Yes	678 (52.2%)		678 (79.6%)	
Confidence in information from social networks		**<0.001**		0.148
No/NSP	634 (47.8%)		634 (77.3%)	
Yes	179 (64.2%)		179 (82.7%)	
Confidence in information from health professionals		0.636		0.410
No/NSP	56 (55.4%)		56 (73.2%)	
Yes	757 (51.1%)		757 (78.9%)	
Confidence in information from WhatsApp or other application		**0.001**		0.289
No/NSP	653 (48.5%)		653 (77.6%)	
Yes	160 (63.1%)		160 (81.9%)	
Knowledge about the cause of COVID-19		0.826		0.869
Wrong	593 (51.1%)		593 (78.2%)	
Good	220 (52.3%)		220 (79.1%)	

Table 3. Continued.

Variable	N (% acceptability of management of home contacts)	p	N (% acceptability of care for simple cases at home)	p
Knowledge about the signs of the disease		0.034		0.935
Wrong	595 (49.1%)		595 (78.3%)	
Good	218 (57.8%)		218 (78.9%)	
Knowledge of the modes of transmission of the virus		<0.001		**0.002**
Wrong	223 (39.0%)		223 (70.9%)	
Good	590 (56.1%)		590 (81.4%)	
Belief in the existence of treatment		0.065		**0.001**
No/NSP	531 (49.0%)		531 (74.8%)	
Yes	282 (56.0%)		282 (85.5%)	
Concern about the epidemic		**0.022**		0.651
No	442 (55.2%)		442 (79.2%)	
Yes	371 (46.9%)		371 (77.6%)	
Psychosocial well-being		0.156		0.605
Wrong	41 (63.4%)		41 (82.9%)	
Good	772 (50.8%)		772 (78.2%)	

Abbreviation: NSP, Don't know.

institutions represented a 'reservoir of favourable attitudes and good will' during the COVID-19 epidemic.[43]

Good knowledge of the modes of transmission of the virus was positively associated with the acceptability of contact management and care of simple cases at home. Since the beginning of the pandemic, the MoHSA has been explaining to the population about the importance of respecting collective and individual prevention measures.[8] These prevention measures have been defined as necessary to curb the spread of the virus.[44] Two studies conducted on HIV have shown that individuals with a good knowledge of the modes of transmission of the virus have a better knowledge of the modes of prevention.[45,46] A study conducted in Senegal in April 2020 showed that barrier gestures seemed to be well followed.[47] Compliance with these measures, together with knowledge of how the virus is transmitted, may explain the good acceptability of management among populations.

The regular search for information on COVID-19 was positively associated with the acceptability of contact management and care of simple cases at home. The information provides knowledge that the recipient did not possess or could not foresee.[48] This definition recognises that information as an element of knowledge reduces ignorance about COVID-19. This knowledge will enable the community to consider the extent of the current context and to adhere to public health measures. A systematic review showed that the provision of information is an important factor in influencing public acceptability of the authorities' measures.[49] This leads to a better understanding of the disease and autonomous decision-making in light of the evolution of the pandemic. This finding seems consistent because people know better what is good for them and are therefore reluctant to accept an intervention that interferes with their own decisions.[49]

Belief in the existence of treatment is positively associated with the acceptability of care in simple cases at home. To date, no specific medication has been recommended to prevent or treat infection of the new coronavirus.[50] At the beginning of the epidemic, Senegal adopted a treatment protocol based on the treatment of patients with hydroxychloroquine[51] or a combination of hydroxychloroquine and azithromycin.[52] This perception of the population in Senegal can be explained by national communication on the 'encouraging' results of this protocol,[52] which has become a source of hope in the event of contamination, despite the risks involved in its acceptability.

Concern about the epidemic is negatively associated with the acceptability of management for home contacts. Health risks or threats, such as crises, involve emotional connotations and uncertainty about their health and economic implications.[53] These risks lead to concern about the pandemic that may be due to the prospect of undesirable future consequences[54] and may explain this attitude.

Limitations

Our study has certain limitations. It only involved people who had a mobile phone, thus excluding marginalised populations. In addition, the cross-sectional nature of the data limits our ability to draw conclusions about causality. However, the sample is representative of the Senegalese population.

Table 4. Results of multivariate analysis

Feature	Acceptability of management for home contacts (Yes) ORaj [95% CI]	Acceptability of care for simple home cases (Yes) ORaj [95% CI]
Age	1.01 [0.99 to 1.02]	0.99 [0.98 to 1.01]
Confidence in the government to fight the epidemic		
No	1	1
Yes	**1.51 [1.10 to 2.08]***	1.30 [0.87 to 1.94]
Knowledge about the cause of COVID-19		
Wrong	1	1
Good	0.92 [0.66 to 1.28]	0.94 [0.62 to 1.45]
Knowledge of the modes of transmission of the virus		
Wrong	1	1
Good	**1.77 [1.27 to 2.48]***	**1.55 [1.04 to 2.28]***
Concern about the epidemic		
No	1	1
Yes	**0.68 [0.50 to 0.93]***	1.07 [0.73 to 1.57]
Regularly search for information on COVID-19		
No	1	1
Yes	**2.39 [1.76 to 3.26]***	**2.12 [1.45 to 3.12]***
Confidence in information from social networks		
No		1
Yes		1.11 [0.69 to 1.85]
Economic well-being score		
Poor		1
Medium		0.69 [0.39 to 1.21]
Rich		**0.46 [0.29 to 0.72]***
Belief in the existence of treatment		
No/NSP		1
Yes		**1.82 [1.19 to 2.83]***
Confidence in institutional information		
No/NSP		1
Yes		**2.10 [1.43 to 3.10]***

Abbreviation: NSP, Don't know. Bold and *, statistically significant.

Conclusion

This study shows that being regularly informed about the disease, knowing how it is transmitted and trusting institutions are important factors in the acceptance of COVID-19 management at the community level. It will be important for the authorities to consider and integrate these aspects for a more effective strategy. However, it is also necessary to have messages that are adapted and targeted according to the categories of the population.

Data availability: Data are available upon request to the authors.

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