

# Adherence to and Practice of Social Distancing among Adults in Kinshasa during the COVID-19 Pandemic

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## Abstract

COVID-19, a communicable viral disease designated as an International Public Health Concern by the WHO in 2020, necessitates effective public health interventions, with social distancing being a pertinent social tool. Despite its recognized importance, there remains uncertainty regarding the correlation between compliance with social distancing and the actual practice of social distancing. This analytical cross-sectional study aimed to investigate the relationship between compliance and practice in social distancing. Utilizing a random sampling method, quantitative data were gathered through a survey questionnaire from a sample of 10,152 participants ( $n_1$ ). The collected data underwent analysis using SPSS. The results of a Chi-square test of independence revealed a statistically significant relationship between compliance with social distancing and the practice of social distancing ( $\chi^2 (1, n = 10,152) = 6,075.694, p = .000$ ). In conclusion, this study establishes a significant association between compliance with social distancing and the actual practice of social distancing.

*Key Words:* COVID-19, Social distancing, Kinshasa, Compliance.

## Introduction

In December 2019, COVID-19 was declared a Public Health Emergency of International Concern by the World Health Organization (WHO), having originated in Wuhan City, China (WHO, 2020). As of July 9, 2022, the pandemic had escalated with over 8 million confirmed cases reported in Africa, underscoring its vast global impact (WHO, 2022). The ramifications of COVID-19 have been pervasive, significantly altering daily life across the world.

Transmission of COVID-19 primarily occurs through respiratory droplets from an infected individual during coughing, sneezing, or talking, especially when in close proximity (Chan et al., 2015; WHO, 2020). Combating the virus requires a blend of biological measures, such as vaccination for herd immunity (Achieving 70% COVID-19 Immunization Coverage by Mid-2022, 2021), and non-biological strategies. However, vaccination rates in some regions remain low; for instance, only 11.4% of the target population in the Democratic Republic of Congo was fully vaccinated by 2022 (CMR COVID-19, 2022).

The importance of sustained adherence to public health interventions, particularly social distancing, has been emphasized for controlling the spread of COVID-19 (Talic et al., 2021).

Social distancing has been identified as one of the most effective and cost-efficient non-biological interventions (Qian & Jiang, 2020; Bo et al., 2021). Fazio et al. (2021) and Liu et al. (2021) highlight the crucial role of social distancing in interrupting transmission chains. Yet, studies by Gibson and Rush (2020), Günther (2020), and Agushi et al. (2020) report suboptimal adherence to social distancing guidelines in some African communities.

This context of variable compliance introduces uncertainty regarding the relationship between the adherence to and the actual practice of social distancing among adults, particularly in controlling COVID-19 transmission (Islam et al., 2020). Consequently, this analytical cross-sectional study, conducted in Kinshasa from March to April 2022, aims to dissect the dynamics between compliance with and the practice of social distancing among adults during the pandemic. It seeks to explore various facets, including the correlation between compliance and practice, challenges to social distancing, the influence of gender, and the impact of educational attainment on social distancing practices among adults. Therefore, the main objective of this analytical cross-sectional study is to assess the relationship between the compliance with social distancing and the practice of social distancing amongst the adults during COVID-19 pandemic in Kinshasa from March to April 2022. The specific objectives for this study were:

1. To assess the relationship between the compliance with social distancing and the practice of social distancing of the adults during COVID-19 pandemic in Kinshasa.
2. To assess the relationship between the challenges to social distancing and the practice of social distancing of the adults during COVID-19 pandemic in Kinshasa.
3. To assess the relationship between the gender and the practice of social distancing of the adults during COVID-19 pandemic in Kinshasa.
4. To assess the relationship between the educational attainment and the practice of social distancing of the adults during COVID-19 pandemic in Kinshasa.

## **Materials and Methods**

***Study Design and Period:*** This analytical cross-sectional study was carried out from March 1st to April 30th, 2022.

***Participants:*** The study targeted adults aged 19 to 59 residing in Kinshasa City within the study timeframe. Eligibility criteria included age between 19 to 59 years, fluency in French or Lingala (able to read, write, and speak), and capability to give verbal consent.

***Sampling Strategy:*** Following Yu et al. (2021), the sample comprised 10,152 adults, selected through a probability sampling method (McCombes, 2021). A two-stage stratified random sampling was employed, treating each municipality as a separate stratum, with subsequent random sampling within each to meet the sample quota.

***Variables:*** The study examined the relationship between independent variables (compliance with social distancing, social distancing challenges, gender, and educational level) and the dependent variable (social distancing practices).

**Data Collection Procedures:** Data were gathered using a structured survey, derived from prior research (Azene et al., 2020; Bakry et al., 2020; Guo et al., 2021; Hailu et al., 2021; Mafuta, 2021; Mukhlis et al., 2021), featuring 26 binary and multiple-choice questions. Surveys were administered face-to-face using paper-and-pen in various public locations across Kinshasa, under the supervision of trained field investigators. Pre-survey orientations ensured clarity on the study aims, tools, and participant engagement. Daily checks on data integrity and completion were conducted.

**Reliability:** A pilot study with 50 individuals yielded a Cronbach's alpha of .92, demonstrating the survey's high internal consistency (Devellis, 2012).

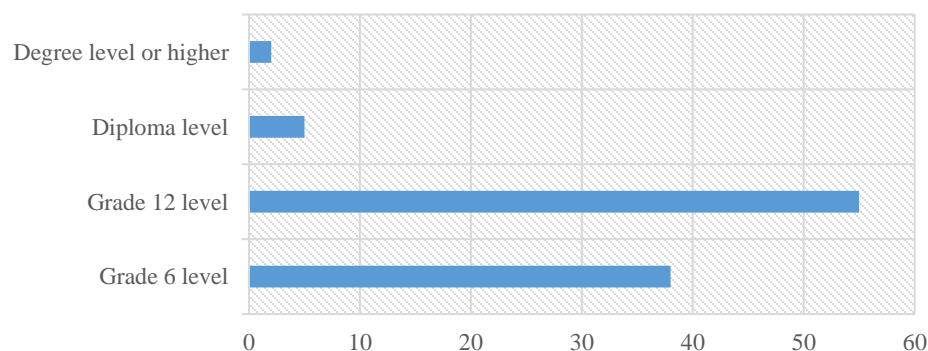
**Validity:** The survey's content validity was confirmed, accurately capturing the constructs of social distancing compliance and practice during the COVID-19 pandemic.

**Statistical Analysis:** Data entry was performed in Microsoft Excel and analyzed in SPSS. Descriptive statistics were summarized narratively and in tables. A chi-square test assessed the association between variables, with significance set at  $p < 0.05$ .

**Ethical Considerations:** The study received ethical approval from the Human Research Ethics Review Committee - Centre International de Recherche Pluridisciplinaire at the University of Lisala. Verbal informed consent was secured from all participants prior to data collection, with strict adherence to ethical protocols throughout the study.

## Results

**Socio-Demographic Characteristics of Participants:** In this analytical cross-sectional study, we included 10,152 participants. The participants' mean age was 32.1 years with a standard deviation of 9.9. The data revealed a gender disparity in participation rates, with females representing 55.2% of the sample, exceeding male participation by 10.4 percentage points. Furthermore, individuals with formal education were significantly more represented, participating at a rate 37.6% higher than those without, making up 68.8% of the sample compared to 31.2% for those with no formal education. Notably, participants at the Grade 12 education level were 10% more prevalent than those in other formal education categories, as illustrated in Figure 1.



### Figure 1 Formal Educational Attainment by Category

*The first specific objective* is to assess the relationship between the compliance with social distancing and the practice of social distancing of the adults during COVID-19 pandemic in Kinshasa. The analysis of the relationship between adherence to social distancing guidelines and their actual implementation among adults in Kinshasa during the COVID-19 pandemic revealed a discrepancy. Specifically, the rate of compliance with social distancing guidelines was marginally higher at 12.5%, compared to an 11% practice rate among participants, as detailed in Table 1.

Table 1 Social Distancing Compliance and Practice Rates

Participants	Compliance with social distancing		Practice of social distancing	
	<i>n</i>	%	<i>n</i>	%
n = 10,152	1,272	12.5	1,118	11

Differences between compliance (12.5%) and actual practice (11%) of social distancing are delineated in Table 1.

The Kolmogorov-Smirnov test confirmed the non-normal distribution of variables, justifying the use of the Chi-square test for this categorical data analysis. The Chi-square test prerequisites were met, including categorical variables on a binary scale, a 95% confidence interval, and a significance level set at  $p < .05$ .

Comparing the observed Chi-square value of 6,075.694 ( $p < .0001$ ) with the critical threshold of  $\chi^2 = 3.841$  ( $df = 1$ ) at a significance level of .05 underscores a significant exceedance, affirming the robustness of the association found in this study (a significant correlation was found between social distancing compliance and practice).

*The second specific objective* is to assess the relationship between the challenges to social distancing and the practice of social distancing of the adults during COVID-19 pandemic in Kinshasa.

The calculated Prevalence Ratio (PR) of 3.96 significantly underscores a robust positive association between high population density and the practice of social distancing, as detailed in the accompanying Table 2. This finding suggests that individuals residing in densely populated areas are approximately four times more likely to adhere to social distancing measures compared to those in less populated regions, highlighting the impact of environmental factors on public health behaviors.

Table 2 High Population Density versus Practice of Social Distancing among Participants

High population density	Practice of social distancing		Total
	Yes	No	
Yes	967	1,547	2,514
No	741	6,897	7,638
Total	1,708	8,444	10,152

The calculated Prevalence Ratio (PR) of 3.1 distinctly highlights a significant association between low socioeconomic status (SES) / poverty and the practice of social distancing among adults, as documented in the corresponding Table 3. This outcome indicates that adults from lower SES backgrounds are three times more likely to engage in social distancing practices, emphasizing the socioeconomic disparities in public health compliance and behavior.

Table 3 Low SES / Poverty versus Practice of Social Distancing among Participants

Low SES / poverty	Practice of social distancing		Total
	Yes	No	
Yes	970	1,036	2,006
No	1,234	6,912	8,146
Total	2,204	7,948	10,152

The calculated Prevalence Ratio (PR) of 3.0 strongly underscores the positive relationship between the community's negative attitudes towards social measures and the adherence to social distancing practices, as detailed in the specified Table 4. This substantial correlation suggests that more negative perceptions within the community may paradoxically increase the likelihood of individuals practicing social distancing, possibly due to heightened awareness and fear of contagion.

Table 4 Negative Attitude of Community versus Practice of Social Distancing among Participants

Negative attitude of community	Practice of social distancing		Total
	Yes	No	
Yes	948	470	1,418
No	1,891	6,843	8,734
Total	2,839	7,313	10,152

The calculated Prevalence Ratio (PR) of 2.4 provides robust evidence of a strong positive relationship between cultural factors and the practice of social distancing, as detailed in the accompanying Table 5. This finding indicates that cultural influences are significantly associated

with increased adherence to social distancing guidelines, suggesting that cultural norms and values play a critical role in shaping public health behaviors.

Table 5 Cultural factors versus Practice of Social Distancing among Participants

Cultural factors	Practice of social distancing		Total
	Yes	No	
Yes	525	1,282	1,807
No	993	7,352	8,345
Total	1,518	8,634	10,152

The calculated Prevalence Ratio (PR) of 0.3 reveals a modest positive association between religious factors and the practice of social distancing, as detailed in the corresponding Table 6. This subtle correlation suggests that religious beliefs and practices may have a limited but discernible influence on the adoption of social distancing measures, underscoring the nuanced role of spirituality in public health behaviors.

Table 6 Religious Factors versus Practice of Social Distancing among Participants

Religious factors	Practice of social distancing		Total
	Yes	No	
Yes	242	4,302	4,544
No	876	4,732	5,608
Total	1,118	9,034	10,152

These findings collectively suggest that challenges such as population density, socioeconomic status, community attitudes, cultural, and religious factors play crucial roles in shaping the practice of social distancing among adults in Kinshasa during the pandemic.

*The third specific objective* is to assess the relationship between the gender and the practice of social distancing of the adults during COVID-19 pandemic in Kinshasa.

The calculated Prevalence Ratio (PR) of 1.2 suggests a notable positive association between gender and the practice of social distancing, as detailed in the accompanying Table 7. This finding indicates that gender-specific factors contribute to variations in the adherence to social distancing guidelines. This modest yet significant correlation underscores the influence of gender on public health behaviors, potentially reflecting underlying social, behavioral, or biological differences that impact how different genders respond to public health directives.

Table 7 Compliance with Social Distancing and Practice of Social Distancing per Gender

Gender	Practice of social distancing		Total
	Yes	No	
Female	665	4,935	5,600
Male	453	4,099	4,552
Total	1,118	9,034	10,152

Table 7 highlights gender disparities in social distancing adherence amidst the COVID-19 pandemic in Kinshasa, showing clear differences in both compliance and practice rates between female and male participants.

*The fourth specific objective* is to assess the relationship between the educational attainment and the practice of social distancing of the adults during COVID-19 pandemic in Kinshasa.

The calculated Prevalence Ratio (PR) of 2.76 robustly highlights a strong positive relationship between educational attainment and the practice of social distancing, as detailed in the associated Table 8. This significant finding demonstrates that individuals with higher levels of education are nearly three times more likely to adhere to social distancing measures compared to those with lower educational levels. This correlation emphasizes the critical role of education in fostering greater awareness and compliance with public health guidelines, potentially due to better access to information and higher health literacy."

Table 8 Figure 1 Formal Educational Attainment versus Practice of Social Distancing

Educational attainment	Practice of social distancing		Total
	Yes	No	
Formal education	960	6,021	6,981
No formal education	158	3,013	3,171
Total	1,118	9,034	10,152

## Discussion

This study aimed to examine the correlation between adherence to and actual practice of social distancing among Kinshasa's adult population during the March-April 2022 COVID-19 pandemic. Findings indicate a significant yet nuanced relationship between these factors, echoing Masters et al. (2020) in observing a high level of social distancing adherence among participants. However, a relatively weak correlation between compliance and practice was noted, aligning with findings from Agusi et al. (2020) and Hailu et al. (2021), and contrasting with Cassidy-Bushrow et al. (2021) and Gualda et al. (2021). This variance may stem from factors like community awareness or adaptation challenges to new social norms, warranting cautious interpretation due to the study's methodological limitations.

Further analysis highlighted a complex relationship between social distancing challenges and adherence, with significant correlations found with factors like high population density, community negativity, low SES/poverty, and cultural influences, while religious factors had minimal impact. These findings corroborate previous research identifying similar barriers to effective social distancing (Anwar et al., 2020; NITI Aayog, 2020; Gibson et al., 2020; Saha et al., 2020; Mbunge et al., 2020) but are limited by the study's demographic and geographical scope.

The study also explored gender differences in social distancing practices, revealing that women were more likely to adhere to these measures than men, aligning with existing literature (Aldarhami et al., 2020; Coroiu et al., 2020; Galasso et al., 2020; Okten et al., 2020; Guo et al., 2021) and suggesting potential behavioral or awareness disparities between genders.

Lastly, the relationship between educational attainment and social distancing practices was assessed, with results indicating that higher educational levels were associated with greater adherence to social distancing, consistent with findings from Bakry et al. (2020) and Zhao et al. (2020). This suggests that education may play a crucial role in informing pandemic-related behaviors, though these findings should be approached with caution due to the study's sampling methodology.

This study explored social distancing during the COVID-19 pandemic in Kinshasa, finding a significant but complex link between guideline adherence and actual practice. Key barriers included high population density, negative community attitudes, low SES/poverty, and cultural factors, with minimal impact from religious beliefs. Gender differences emerged, showing women more compliant than men, and higher education levels correlated with increased social distancing adherence. These findings highlight the interplay of various factors in pandemic behavior, though caution is advised in their interpretation due to study limitations.

## **Conclusion**

In conclusion, this study demonstrates a significant link between the commitment to social distancing guidelines and their actual practice among adults, highlighting a clear protective advantage for those who not only endorse but also enact these measures. This finding underscores the critical need for public health efforts to not only promote understanding of social distancing but also to translate this knowledge into real-world action.

The association revealed points to the effectiveness of public health campaigns that encourage both the cognitive and behavioral aspects of social distancing, suggesting that a comprehensive approach can offer enhanced protection.

Future research could explore several avenues to deepen this understanding:

1. Behavioral Interventions: Assess the impact of interventions aimed at closing the gap between knowing and doing in social distancing, through educational and motivational strategies.



2. **Psychosocial Influences:** Examine how factors like risk perception and social influences affect the move from intention to action in social distancing behaviors.
3. **Longitudinal Studies:** Investigate the long-term effects of consistent social distancing practices to understand the persistence of protective benefits over time.
4. **Demographic Differences:** Study how various demographic groups might differ in their approach to social distancing compliance and practice, to tailor public health messages more effectively.
5. **Public Health Measure Comparison:** Evaluate the relative success of different public health initiatives in converting awareness into action, extending beyond social distancing to other health behaviors.

Such research could offer valuable insights into optimizing public health strategies by aligning behavioral intentions with actions, thereby enhancing the overall effectiveness of interventions against pandemics.

### ***Conflict of Interest***

The authors report no conflicts of interest.

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