Contagiousness under antiretroviral therapy and stigmatization toward people with HIV.

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Abstract

Perceived contagiousness is a major dimension underlying HIV-related stigmatization. Antiretroviral therapy can diminish contagiousness by reducing viral load levels in HIV-infected individuals. To test the assumption that reductions in contagiousness can lead to a decrease in stigmatizing reactions we conducted an experimental online study. A sample of 752 participants (50.9% female) read a short vignette depicting an HIV-positive individual with either a high or a low viral load and were either given or not given information about the association between viral load and contagiousness. Subsequently, participants were asked to rate their willingness to stigmatize this individual by responding to two measures of social and physical distance. Differences between the low and the high viral load information groups and the combined no-information groups (forming a quasi-control group) were analyzed using ANCOVA, controlling for gender and baseline perceptions of contagiousness. The covariates perceived contagiousness at baseline and gender were associated with social and physical distancing, but the viral load/information factor was only significant in physical distancing. Planned contrast analyses confirmed that physical distancing in the informed group was lower in the low viral load condition compared to the high viral load condition and to the control group. We thus found evidence for the significant role of perceived contagiousness in the HIV-related stigma and were able to experimentally demonstrate the potential of antiretroviral therapy to reduce HIV-related stigmatization by lowering viral load and contagiousness, when these changes are accompanied by a decreased perception of contagiousness.

Keywords

HIV, stigma, antiretroviral treatment, experiment, contagiousness, viral load

Introduction

HIV-related stigmatization continues to pose a great burden for people living with HIV/AIDS (PLWHA), causing multiple adverse effects on their mental and physical health (Logie & Gadalla, 2009). It thus remains a priority to understand the predictors and underlying mechanisms of the stigmatization process. Several factors that contribute to the stigmatization process have been proposed in the research literature (Alonzo & Reynolds, 1995; Herek, 1999). One of these factors that is receiving major attention is the contagious nature of this health condition (Bishop, Alva, Cantu, & Rittiman, 1991; Bos, Schaalma, & Pryor, 2008; Crandall, Glor, & Britt, 1997).

Contagiousness of the HIV disease defined as the probability of HIV transmission is strongly determined by the level of the viral load in bodily fluids (Operskalski et al., 1997; Quinn et al., 2000), which is dramatically reduced by antiretroviral therapy (ART). Considering the role of contagiousness in the stigmatization process, ART has the potential to reduce HIV-related stigmatization if reductions in viral load lead to reductions in perceived contagiousness (Drewes, 2013).

In this study we conducted an online experiment to test the assumption that a lower viral load achieved through ART can reduce stigmatizing reactions. We presented a vignette describing an HIV-positive individual with either a high viral load or a low viral load to the participants. We hypothesized that a vignette of this individual with a low viral load will result in less willingness to stigmatize the individual than a vignette of this individual with a high viral load. Because the broad majority of the general population in Germany is probably not aware of the associations between ART, viral load, and contagiousness, we informed participants about these associations with a short text. We also created a quasi-control group of participants who did not receive this information.

Methods

Subjects

We used an online market research panel to recruit participants. Individuals who identified as homosexual, bisexual or stated they had been diagnosed as HIV-positive were screened out as ineligible during the questionnaire because they would differ in knowledge and stigmatizing attitudes from the general population.

Out of a sample of 800 individuals, 48 participants were excluded from the analysis because their response time was shorter than half of the median response time (33 participants), they were identified as outliers (age > 48 years; 5 participants), or they claimed they didn't read or didn't understand the informational text (10 participants).

The resulting sample of 752 participants consisted of 383 women and 369 men from all over Germany. The average age was 29.6 years, with ages ranging from 20 to 41 years. More than half of the sample reported finishing academic preparatory school (52.7%). Approximately half the sample had been tested for HIV in their lifetime, and 11% claimed personal knowledge of a person with HIV.

Design and procedures

The experimental design used two independent variables indicating (1) whether information was provided about the association of viral load and contagiousness (*yes* or *no*), and (2) the level of the described person's viral load in the vignette (*low* or *high*). The variables were combined to build four experimental groups: g_{il} (information provided and low viral load), g_{ih} (information provided and high viral load), g_{nl} (no information and low viral load) and g_{nh} (no information and high viral load). Participants were randomly assigned to one of the four conditions.

The information on the relationship between ART, viral load, and contagiousness was presented in a concise text. A short vignette describing a heterosexual HIV-positive individual, who had either a high or a low viral load, respectively due to taking or not taking

ART, was then shown to each participant. Male participants read a vignette depicting a female individual, and vice versa.

Variables

Baseline perceived contagiousness

Prior to presenting the informational text and the vignette, we assessed participants' general perceptions of the contagiousness of HIV, which was operationalized as the perceived probability of being HIV-infected after one act of unprotected sexual intercourse with an HIV-positive individual, using a percentage scale. The scale endpoints were framed as 0 = *definitely not HIV-infected* and 100 = *definitely HIV-infected*. The mean probability in this sample was 69.4 (SD = 25.8). This variable was used as a covariate in ANCOVA analyses.

HIV-related stigma

Stigmatizing attitudes were assessed as the dependent variable after the vignette presentation using a self-constructed measure of social distance (Bogardus, 1925). 13 items were constructed measuring willingness to engage in different types of social, physical, and sexual interactions. Responses used a four-point Likert-type scale (*definitely willing to do* – *definitely not willing to do*).

Factor analyses revealed a two-factor solution. The first of the two emerging scales was named *social distance*. It contained seven items describing social and physical interactions that do not imply the possibility of mucosal contact, e.g., shaking hands, working together in the workplace, and having a close friendship. This scale's reliability was excellent, with a Cronbach's α of .90.

The second scale, *physical distance*, included four items. All interactions described in the second scale imply the possibility of mucosal contact, such as mouth-to-mouth kissing or sexual intercourse with a condom. Reliability for this scale was good (Cronbach's α =.87).

Two items could not be assigned to either of the two factors and were not used in subsequent analyses.

Research questions and analysis

To confirm our hypotheses, we expected a difference in means between the two information groups: willingness to stigmatize should be lower in g_{il} than in g_{ih}. Using the combined no-information groups as a quasi-control group, we expected to find a greater willingness to stigmatize in this group than in g_{il}. In the absence of such a finding, the information provided in the text about the association between viral load and contagiousness could not be associated with a decrease in the willingness to stigmatize, as differences between the informed low viral load and high viral load groups could equally stem from an increased willingness to stigmatize in g_{ih}.

Preliminary analyses revealed no differences between groups g_{nl} and g_{nh} on social distance, $t = .011$, $df = 389$, $p = .991$, or physical distance, $t = 8.55$, $df = 393$, $p = .393$. Accordingly, they were merged to a single group, g_n. Using these three groups as factors and baseline perceived contagiousness and gender as covariates, ANCOVA were performed for each of the two dependent variables, and contrast analyses would be employed to compare means between groups g_{il} and g_{ih} and between group g_{il} and g_n.

Results

The results of the ANCOVA showed that both covariates were significantly related to social distance, with gender: $F(1, 713) = 8.9$, $p < .01$, partial $\eta^2 = .012$, and perceived contagiousness: $F(1, 713) = 11.8$, $p < .01$, partial $\eta^2 = .016$; and also to physical distance, with gender: $F(1, 719) = 8.4$, $p < .01$, partial $\eta^2 = .012$, and perceived contagiousness: $F(1, 719) = 20.3$, $p < .01$, partial $\eta^2 = .028$. The group factor had a significant effect on physical distance, $F(2, 719) = 7.9$, $p < .01$, partial $\eta^2 = .022$, but not on social distance, $F(2, 713) = 1.7$, $p > .01$. The planned contrast analyses were thus performed only for the dependent variable physical distance. Results showed that scores on the physical distance scale were

significantly lower g_{il} compared to g_{ih}, $p < .01$, 95% *CI* [0.11, 0.48], $r = .34$. Also, physical distance scores were lower in g_{il} compared to g_{n}, $p < .01$, 95% *CI* [0.14, 0.45], $r = .34$ (see Figure 1).

[insert Fig. 1 here]

While perceived contagiousness was positively correlated with social and physical distance, the relationship between gender and the two dependent variables differed (see Figure 2). Female participants expressed less social distancing than male participants, but they expressed greater physical distancing than male participants.

[insert Fig. 2 here]

Discussion

In this study, we were able to demonstrate a causal effect of the experimental manipulation of viral load levels on participants' willingness to engage in physical interactions with the fictive individual, but not on their willingness to engage in social interactions, with levels of the latter actually very high in our sample. Furthermore we found an actual decrease in stigmatization associated with the low viral load condition compared to a control group.

We also found an association between baseline perceived contagiousness of HIV and stigmatizing reactions towards the fictive individual. Gender was also associated with both types of stigmatizing reactions, but in a different direction for each.

The failure to demonstrate an effect of the experimental manipulation on social distancing is most likely due to the very low levels of social distancing we found in our sample - maybe a result of a social desirability bias - producing a ceiling effect that made it difficult to detect any expected changes in the expression of social distancing.

Our results provide correlational and experimental evidence that perceived contagiousness plays an important role in HIV stigmatization. We can also conclude that ART can lead to the destigmatization of antiretrovirally treated PLWHA when the perception of a reduced viral load is coupled with the perception of reduced contagiousness.

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Figures

Figure 1

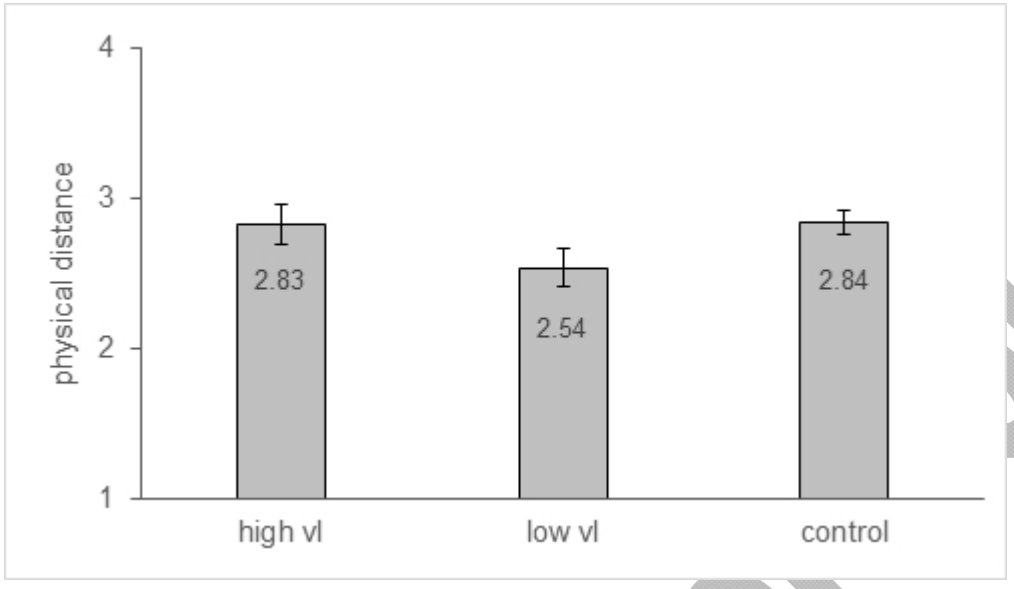

Figure 1: Scores on the physical distance scale for the three groups: the high viral load/information group, the low viral load/information group, and the quasi-control group, adjusted for baseline perceived contagiousness scores and gender. Higher scores indicate greater distancing. Error bars represent the 95% confidence interval.
Note: high vl = group g_{ih} (information/high viral load); low vl = group g_{il} (information/low viral load); control = group g_n (no information/high or low viral load)

Figure 2

Figure 2: Non-adjusted scores on the social and physical distance scales for female and male participants. Higher scores indicate greater distancing.