Well-being during COVID-19 pandemic: A comparison of individuals with minoritized sexual and gender identities and cis-heterosexual individuals

Pichit Buspavanich, Sonia Lech, Eva Lermer, Mirjam Fischer, Maximilian Berger, Theresa Vilsmaier, Till Kaltofen, Simon Keckstein, Sven Mahner, Joachim Behr, Christian J. Thaler, Falk Batz

1 Department of Psychiatry, Psychotherapy and Psychosomatics, Brandenburg Medical School Theodor Fontane, Neuruppin, Germany, 2 Department of Psychiatry and Psychotherapy, Charité – Universitätsmedizin Berlin, Corporate Member of Freie Universität Berlin and Humboldt-Universität zu Berlin, Berlin, Germany, 3 Institute of Sexology and Sexual Medicine, Charité – Universitätsmedizin Berlin, Corporate Member of Freie Universität Berlin and Humboldt-Universität zu Berlin, Berlin, Germany, 4 Institute of Medical Sociology and Rehabilitation Science, Charité – Universitätsmedizin Berlin, Corporate Member of Freie Universität Berlin and Humboldt-Universität zu Berlin, Berlin, Germany, 5 Center for Leadership and People Management, LMU Munich, Munich, Germany, 6 FOM University of Applied Sciences of Economics and Management, Essen, Germany, 7 Institute of Sociology and Social Psychology, University of Cologne, Cologne, Germany, 8 Department of Obstetrics and Gynecology and Center for Gynecological Endocrinology and Reproductive Medicine, University Hospital, LMU Munich, Munich, Germany, 9 Research Department of Experimental and Molecular Psychiatry, Department of Psychiatry and Psychotherapy, Charité – Universitätsmedizin Berlin, Corporate Member of Freie Universität Berlin and Humboldt-Universität zu Berlin, Berlin, Germany, 10 Faculty of Health Sciences Brandenburg, Joint Faculty of the University of Potsdam, Brandenburg University of Technology Cottbus-Senftenberg and Brandenburg Medical School, Potsdam, Germany

These authors contributed equally to this work.
* pichit.buspavanich@charite.de

Abstract

Background

Preliminary empirical data indicates a substantial impact of the COVID-19 pandemic on well-being and mental health. Individuals with minoritized sexual and gender identities are at a higher risk of experiencing such negative changes in their well-being. The objective of this study was to compare levels of well-being among cis-heterosexual individuals and individuals with minoritized sexual and gender identities during the COVID-19 pandemic.

Methods

Using data obtained in a cross-sectional online survey between April 20 to July 20, 2020 (N = 2332), we compared levels of well-being (WHO-5) across subgroups (cis-individuals with minoritized sexual identities, individuals with minoritized gender identities and cis-heterosexual individuals) applying univariate (two-sample t-test) and multivariate analysis (multivariate linear regression).
Results

Results indicate overall lower levels of well-being as well as lower levels of well-being in minoritized sexual or gender identities compared to cis-heterosexual individuals. Further, multivariate analyses revealed that living in urban communities as well as being in a relationship were positively associated with higher levels of well-being. Furthermore, a moderation analysis showed that being in a relationship reduces the difference between groups in terms of well-being.

Conclusion

Access to mental healthcare for individuals with minoritized sexual and gender identities as well as access to gender-affirming resources should be strengthened during COVID-19 pandemic. Healthcare services with low barriers of access such as telehealth and online peer support groups should be made available, especially for vulnerable groups.

Introduction

In December 2019, the novel virus SARS-CoV-2 (COVID-19) was detected. About 13 months later more than 93 million people have been infected by COVID-19 and more than 2.5 million people died by February 2021 [1]. On 24th January 2020 the first case of COVID-19 has been reported in Germany [2]. The World Health Organization (WHO) designated COVID-19 as a Public Health Emergency of International Concern on 30th January 2020. On 11th March 2020 the WHO declared COVID-19 a pandemic. By the time of writing in April 2021, the covid-19 pandemic reached a level of humanitarian crisis. To decelerate the rapid transmission of COVID-19, many non-pharmacological interventions were enforced as a way to control the pandemic. On 22nd March the first measures of social isolation including home confinement were declared by the German federal states. Quarantine is a proven and successful measure to combat infectious diseases (e.g., Ebola); still, the global extent of confinement has never been higher [3]. Accordingly, the socioeconomic consequences of the COVID-19 pandemic in Germany have been significant. There has been an increase in unemployment, an economic recession, and an increase in social inequality, e.g. in income, education [4], and health [5]. Public support programs by the federal and state governments attempted to mitigate these consequences. Among several economic funding schemes for companies to prevent insolvency, the government offered financial aid for employees in receipt of a reduced salary, as well as financial aid for families and students in need [6–8]. COVID-19 and the containment measures have led to significant changes in certain lifestyle behaviors as well as in life satisfaction and general well-being [9–11]. Up to now, most of the research on the COVID-19 pandemic has focused on physical health. Literature shows a significant effect of the COVID-19 pandemic on daily living with an impairment in quality of life and an increase in uncertainty of the present and the future, distress, fear and panic [12]. This has negative effects on well-being and mental health with an increase of emotional disorders [11,13–15].

In general, mental distress and acute symptoms such as apprehension, stress, depression, panic or anxiety, and chronic symptoms such as insomnia and post-traumatic stress disorder (PTSD), have increased since the COVID-19 pandemic [12,16,17]. Individuals with minoritized sexual and gender identities like lesbian, gay, bisexual, trans*, non-binary, queer, inter* and asexual (LGBTQIA*) constitute a particularly vulnerable social and medical group. Past
research acknowledges that individuals with minoritized sexual and gender identities experience greater health disparities compared to heterosexual and cisgender individuals, respectively [18]; gender minority people stand out as particularly vulnerable within the LGBTQIA+ group [19–21]. These health disparities are understood to be consequences of minority stress due to social disadvantages, discrimination and stigmatization in all areas of life [22,23]. Conceptual frameworks, such as the Minority Stress Model, explain the association between discrimination, social stress, and mental health among LGBTQIA+ communities [24,25] The Minority Stress Model postulates that individuals belonging to minoritized groups are exposed to unique stress related to their race, gender or sexual orientation. The model includes external distal minority stressors such as discrimination or exposure to violence as well as internal proximal minority stressors such as expectations of rejection or internalized stigma. As protective factors against minority stress, the model includes social support and community connectedness [20,24,25]. Over the last years, research on needs and mental health of LGBTQIA+ is increasing [26]. Overall, the incidence of mental health disparities and psychological disorders such as depression, anxiety disorders, suicidality, and substance abuse was often found to be significantly higher among LGBTQIA+ individuals compared to the non-LGBTQIA+ population [27–29], in particular among individuals with minoritized gender identities [19,20,30]. In Germany, the legal situation of minoritized sexual and gender identities has improved during the last years. The General Equal Treatment Act of 2006 prohibits unequal treatment based on sexual orientation and gender in civil and labor law [31], whereby trans* and inter* persons are explicitly included in the gender clause. In addition, since 2011, trans* individuals are able to change their gender registration without having undergone gender reassignment surgery involving forced sterilization. In 2017, marriage was opened to same-sex couples, also granting adoption rights to same-sex couples. Since 2018, the German state recognizes the third gender entry “diverse” in addition to “male” and “female”, particularly aimed at inter* people [31]. At the same time, however, there has been an increase in anti-LGBTQIA+ crime and a strengthening of right-wing populism. Corresponding political parties fight against diversity and LGBTQIA+ rights and propagate traditional gender roles [32]. Crises such as the COVID-19 pandemic and resulting trauma put individuals with minoritized sexual and gender identities at a higher psychological risk of decreased well-being and exacerbation of preexisting mental health problems [33,34]. Barriers to medical care in the context of COVID-19 include, among others, a lack of access to LGBTQIA+-friendly medical care, psychotherapy and social support groups in general, and for those seeking gender-affirming healthcare and services in particular [11]. Despite the well-documented vulnerabilities of LGBTQIA+ individuals, so far, there is no empirical work published that focused on a comparison of psychological needs, general well-being and risk or protective factors during the COVID-19 pandemic among people with minoritized sexual and/or gender identities and cis-heterosexual individuals. Yet, it is crucial to act immediately in response to the effects of the COVID-19 pandemic on well-being and mental health, in particular for vulnerable social groups such as individuals with minoritized sexual and gender identities. Further, it is of great interest to explore the role of general protective factors for well-being and mental health such as age [35,36], employment [35], partnership status [37,38], place of living [39,40], and children [38] during the COVID-19 pandemic.

**Aim of the present study**

The present study aims to examine the impact of the COVID-19 pandemic and the precautionary social isolation measures in Germany on current well-being of individuals with minoritized sexual and gender identities (LGBTQIA+) and cis-heterosexual individuals. Thereby, particular attention is paid to heterogeneity within the larger LGBTQIA+ group by comparing
cis- and trans* individuals to one another, regardless of their sexual orientation; and by drawing within-group comparisons regarding sexual orientation (i.e., comparing cis-lesbian- or gay-identifying individuals to cis-bisexual individuals). Further, general protective and risk factors associated with well-being for all individuals will be examined. Based on previous literature, the following hypothesis are proposed: Levels of well-being in the overall population in Germany have decreased during the COVID-19 pandemic compared to levels before the COVID-19 pandemic (Hypothesis 1), and levels of well-being are lower among all LGBTQIA+ populations (cis-individuals with LGBQA+ identities and individuals with minoritized gender identities) compared to a cis-heterosexual population (Hypothesis 2). Further, we examined whether age, residential environment, employment status, relationship status, parenthood and COVID-19 status are associated with well-being and the sexual and gender identity (Research Question). Based on our results, we derive recommendations for healthcare providers and public policy makers.

Materials and methods

Setting, study design and sample

An anonymous nationwide online cross-sectional survey was conducted, using SoSci Survey as a platform. The survey was administered in German language and shared via online invitations, where people were invited to partake in a survey on sexuality and family planning during the Covid-19 crisis. Between April 20 to July 20, 2020, a link with access to the survey was distributed in social communication networks on FacebookTM, InstagramTM, TwitterTM and WhatsappTM. We posted invitations to the questionnaire on national social and communication groups on FacebookTM as online bulletin boards for cities and regions in Germany (e.g., “Bulletin board Hamburg” (Schwarzes Brett Hamburg)). Further, the link to the online survey was promoted in LGBTQIA+ community support groups like the FacebookTM group “Queer in Germany (LGBTQ+)” (Queer in Deutschland (LGBTQ+)). Moreover, the questionnaire was distributed within several networks of LGBTQIA+ communities like the “Lesbian and Gay Federation in Germany” (Lesben- und Schwulenverband–LSVD), the largest German non-governmental LGBT rights organization. Additionally, we promoted the survey through email distribution lists of Ludwig Maximilian University of Munich. Some participants promoted the survey within their own networks (snowball sampling). Prior to data collection, all participants reviewed and accepted an online-based consent page which included information on the research project. Participation in the study was anonymous, voluntarily and without any compensation. The survey was registered by the Ethics Review Committee of the Faculty of Medicine, LMU Munich (registration number: 20-344KB) and conducted with accordance of the Declaration of Helsinki. A total of N = 2463 participants participated in the online survey. To maximize participation, the inclusion criteria were held broad and included only (1) a minimum age of 18 years and (2) German proficiency. Due to missing values, n = 131 participants had to be excluded from the analysis. Therefore, eligible participants for analysis resulted in N = 2332 participants.

Measures

Gender identity and sexual orientation. Gender identity and sexual orientation were assessed with the item “In your opinion, which of the following categories most apply to you?”. The following answer categories were provided: heterosexual, homosexual, bisexual, asexual, female, male, cis (“I identify with the gender assigned at birth”), trans* (“I do not identify with the gender assigned at birth”) and others. Note that we are aware of the pathologizing nature of the term “homosexual”. In Germany, the term “homosexuell” is still widely used; for reasons of
transparency, we report the direct translation as it appeared in the survey question. Multiple answers were possible. For the purpose of the analysis, we divided all participants into 12 groups according to their self-assigned gender identity and sexual orientation: (I) cis-heterosexual women, (II) cis-heterosexual men, (III) cis-lesbian women, (IV) cis-gay men, (V) cis-bisexual women, (VI) cis-bisexual men, (VII) cis-asexual women, (VIII) cis-asexual men, (IX) trans’ women, (X) trans’ men, (XI) non-binary gender identities (participants who identify as female and male), and (XII) inter* people. The star (*) indicates that the respective terms include further gender identities beyond the expression transgender, transident, transsexual and inter*, respectively. Regardless of their sexual orientation, all participants who reported a minoritized gender identity to their form one analytical group separate from cis-gendered people with minoritized sexual identities in the presented descriptive statistics and the analyses.

The three analytical groups are: individuals with minoritized sexual identities (cis-lesbian women, cis-gay men, cis-bisexual women, cis-asexual men and cis-asexual women), individuals with minoritized gender identities (trans* women, trans’ men, non-binary gender and inter* people) and cis-heterosexual individuals (cis-heterosexual women and cis-heterosexual men). For the multivariate analysis we used dichotomous variables for cis-lesbian/gay, cis-bisexual, cis-asexual, trans*, non-binary and inter* individuals whereby cis-heterosexual served as the reference group in each of these variables.

**Well-being.** We used the 5-item short version of World Health Organization-Five Well-Being Index-10 (WHO-5) to measure current mental well-being [41]. The WHO-5 is a brief self-reported questionnaire, which consists of five items assessing subjective psychological well-being over a 14-day period. Each item is scored from 0 (none of the time) to 5 (all of the time). The total raw score ranges from 0 to 25, whereby higher values indicate better well-being. A total raw score ≤13 indicates a clinically significant depression [6]. The final score is calculated multiplying the total raw score by 4, with 0 representing the worst imaginable well-being and 100 representing the best imaginable well-being. This was conducted in order to compare the values with data from the German validation study of the WHO-5 [42]. In the present study, the scale showed very good internal consistency (Cronbach’s alpha = 0.873).

**Protective factors for well-being.** Items were treated as categorical variables. For more details, see descriptive statistics in Table 1. In the multivariate analysis we used the following dichotomous variables: age (under 35 years versus 36 years and above), employment status (employed versus not employed (including students)), residential environment (urban cities versus rural communities under 20,000 inhabitants), relationship status (single versus in a relationship), parenthood (yes/no), and COVID-19 status (current or previous COVID-19 infection versus not infected or not tested).

**Statistical analyses**

This study focuses on the impact of the COVID-19 precautionary measures on well-being in individuals with minoritized sexual and gender identities compared to cis-heterosexual individuals. First, descriptive statistics were calculated for all subgroups and variables of interest (Table 1). To explore Hypothesis 1, assuming that individual’s current overall levels of well-being in Germany have decreased during the COVID-19 pandemic compared to prior levels before the COVID-19 pandemic, t-tests against a fixed value from a previous study [42] were conducted. To test Hypothesis 2, saying that individual’s current overall levels of well-being are lower among LGBTQIA+ populations compared to a cis-heterosexual population, we conducted a two-sample t-test for the comparison of the groups cis-heterosexual vs. not cis-heterosexual as well as an ANOVA with post-hoc tests for more differentiated insights. To analyze which group has a higher probability of being below the WHO-5 cut-off score, we
|                          | Cis-heterosexual individuals | Cis-individuals with minoritized sexual identities | Individuals with minoritized gender identities |
|--------------------------|------------------------------|-----------------------------------------------|-----------------------------------------------|
| N = 2332                 | Women n = 1004 Men n = 300  | Lesbian women n = 353 Gay men n = 108 Bisexual women n = 254 Bisexual men n = 80 Asexual women n = 29 Asexual men n = 7 | Trans’ women n = 60 Trans’ men n = 96 Non-binary n = 31 Inter’ n = 10 |
| Age                      |                              |                                               |                                               |
| 18–25 years              | 389 (16.7)                  | 123 (18.0)                                   | 90 (25.3)                                    |
|                          | (38.8)                      | (13.0)                                       | (16.7)                                       |
| 26–35 years              | 476 (47.5)                  | 118 (39.9)                                   | 141 (39.9)                                   |
|                          | (47.5)                      | (39.9)                                       | (39.9)                                       |
| 36–45 years              | 116 (11.6)                  | 35 (11.7)                                    | 93 (26.3)                                    |
|                          | (11.6)                      | (11.7)                                       | (26.3)                                       |
| Over 46 years            | 21 (2.1)                    | 24 (8.0)                                     | 29 (8.2)                                     |
|                          | (2.1)                       | (8.0)                                        | (8.2)                                        |
| Relationship status      |                              |                                               |                                               |
| Single                   | 267 (26.6)                  | 102 (34.0)                                   | 81 (22.9)                                    |
|                          | (26.6)                      | (34.0)                                       | (22.9)                                       |
| In a relationship        | 737 (73.4)                  | 198 (66.0)                                   | 272 (77.1)                                   |
|                          | (73.4)                      | (66.0)                                       | (77.1)                                       |
| Parenthood               |                              |                                               |                                               |
| yes                      | 823 (87.6)                  | 223 (82.0)                                   | 250 (77.2)                                   |
|                          | (87.6)                      | (82.0)                                       | (77.2)                                       |
| no                       | 117 (12.4)                  | 49 (18.0)                                    | 74 (22.8)                                    |
|                          | (12.4)                      | (18.0)                                       | (22.8)                                       |
| Residential environment  |                              |                                               |                                               |
| Metropolis1              | 657 (67.3)                  | 178 (62.6)                                   | 187 (56.0)                                   |
|                          | (67.3)                      | (62.6)                                       | (56.0)                                       |
| Medium-sized town2       | 131 (13.1)                  | 73 (20.7)                                    | 46 (13.5)                                    |
|                          | (13.1)                      | (20.7)                                       | (13.5)                                       |
| Small town3              | 107 (10.7)                  | 44 (12.5)                                    | 40 (13.3)                                    |
|                          | (10.7)                      | (12.5)                                       | (13.3)                                       |
| Rural community4         | 90 (9.0)                    | 57 (16.2)                                    | 50 (16.2)                                    |
|                          | (9.0)                       | (16.2)                                       | (16.2)                                       |
| Employment status        |                              |                                               |                                               |
| Self-employed            | 53 (5.3)                    | 11 (3.7)                                     | 23 (6.5)                                     |
|                          | (5.3)                       | (3.7)                                        | (6.5)                                        |
| Employed                 | 464 (46.3)                  | 135 (45.2)                                   | 244 (69.3)                                   |
|                          | (46.3)                      | (45.2)                                       | (69.3)                                       |
| Student                  | 425 (42.4)                  | 136 (45.5)                                   | 59 (16.8)                                    |
|                          | (42.4)                      | (45.5)                                       | (16.8)                                       |
| Not employed             | 60 (6.0)                    | 17 (5.7)                                     | 26 (7.4)                                     |
|                          | (6.0)                       | (5.7)                                        | (7.4)                                        |
| COVID-19 status          |                              |                                               |                                               |
| Infected, symptoms       | 0 (0.0)                     | 0 (0.0)                                      | 0 (0.0)                                      |
|                          | (0.0)                       | (0.0)                                        | (0.0)                                        |
| Infected, no symptoms    | 2 (0.2)                     | 0 (0.0)                                      | 0 (0.0)                                      |
|                          | (0.2)                       | (0.0)                                        | (0.0)                                        |
| Previous infected        | 7 (0.7)                     | 2 (0.7)                                      | 2 (0.6)                                      |
|                          | (0.7)                       | (0.7)                                        | (0.6)                                        |
| Not infected/not tested  | 983 (99.1)                  | 294 (98.7)                                   | 337 (99.1)                                   |
|                          | (99.1)                      | (98.7)                                       | (99.1)                                       |

Notes: 1 = 100,000 or more inhabitants, 2 = 20,000 to 100,000 inhabitants, 3 = 5,000 to 20,000 inhabitants, 4 = up to 5,000 inhabitants.

https://doi.org/10.1371/journal.pone.0252356.t001
performed a logistic regression. To answer the Research Question, we examined the association between subgroups and current well-being by conducting a multivariate linear regression. We used the WHO-5 final score as our dependent variable, and the dummy variables of the individual identities (cis-heterosexual as reference versus cis-lesbian/gay, cis-bisexual, cis-asexual, trans*, non-binary and inter*) as independent variables. Further, we included the following protective factors for well-being in the model: age, residential environment, employment status, relationship status, parenthood and COVID-19 status. Hayes’ PROCESS tool (model 1) was used for moderation analyses to test the influence of potentially protective factors. A significance level of 0.05 was set for all analyses. We used SPSS (Version 26) and RStudio (Version 1.4.1106) for statistical analysis.

**Results**

In total, N = 2332 participants were included in the analysis. Of those, n = 1304 (55.9%) self-identified as *cis-heterosexual individuals*, n = 832 (35.6%) self-identified as *individuals with minoritized sexual identities*, and n = 197 (8.4%) self-identified as *individuals with minoritized gender identities*. Among the cis-gender respondents, there were more women (n = 1640, 76.8%) than men (n = 495, 23.2%). Concerning age, the vast majority of individuals with minoritized sexual identities, individuals with minoritized gender identities and cis-heterosexual individuals were younger than 36 years old. In terms of employment status most of the participants across all three groups n = 1354 (58.1%) were currently working and a total of n = 800 (34.3%) participants were students. Regarding the residential environment, most participants n = 1811 (77.7%) lived in urban cities with more than 20,000 inhabitants. Only n = 8 participants reported a current COVID-19 infection and n = 13 reported a previous COVID-19 infection. For more details on each individual group, descriptive statistics of the sample can be obtained from Table 1.

To test Hypothesis 1, the mean value of well-being M = 75.6 (SD = 13.85) from the study by Brähler et al. [42] was used as a fixed value. Results have shown that levels of well-being in all groups were significantly lower compared to the mean score from the reference sample by Brähler and colleagues. However, it is important to note that the standard deviations of the current study were higher than in the reference survey sample (for more detail see Table 2).

To test Hypothesis 2, a two sample t-test revealed that participants within the cis-heterosexual group had a significant higher mean level of well-being (M = 54.90, SD = 20.20) compared to participants who assigned themselves to the overall LGBTQIA+ group (M = 51.31, SD = 21.09), t(1711.40) = 3.89, p = < 0.001, d = 0.17. ANOVA results showed a significant group effect, F(6,2325) = 7.51, p < 0.001 indicating differences in well-being between the subgroups within the LGBTQIA+ group. Post-hoc tests were calculated to determine which groups differ significantly in well-being from the cis-heterosexual group. Results revealed that participants from the group cis-bisexual (p < 0.001), cis-asexual (p = 0.024) and trans* (p = 0.001) individuals showed significantly lower levels of well-being compared to participants from the cis-heterosexual group. In terms of clinically significant depression, descriptive analyses revealed that bisexual individuals reported the highest levels of clinical depression on the WHO-5, followed by cis-asexual individuals, non-binary individuals and trans* individuals. The lowest level of clinically significant depression was reported by cis-heterosexual individuals and cis-lesbian/gay individuals (for more detail see Table 2).

A chi-squared test indicated that the overall effect of the group is statistically significant (see Table 3). A logistic regression revealed that for cis-heterosexual individuals (reference), the log odds of being below the cut-off value (versus above) decrease significantly. However, for bisexual as well as for trans* individuals the log odds of being below the cut-off value (versus above)
increase compared to the reference group. All other estimates were not significant. To answer the Research Question, a multivariate linear regression model (see Table 3) with the WHO-5

Table 3. Logistic regression of self-assigned sexual and gender identities on clinically significant depression as dependent variable measured with WHO-5.

| Group                          | Chi² (df) | Regression coefficient | Standard Error | Odds Ratio | p-value | 95%-confidence interval |
|--------------------------------|-----------|------------------------|----------------|------------|---------|-------------------------|
|                                |           |                        |                |            |         | Lower                   | Upper                  |
| Intercept (Cis-heterosexual as reference) | 39.90 (6) | -0.20                  | 0.06           | 0.81       | < 0.001 | 0.73                   | 0.91                   |
| Cis-lesbian/gay                 |           | -0.06                  | 0.11           | 0.93       | 0.56    | 0.75                   | 1.16                   |
| Cis-bisexual                    |           | 0.70                   | 0.13           | 2.02       | < 0.001 | 1.58                   | 2.59                   |
| Cis-asexual                     |           | 0.42                   | 0.34           | 1.53       | 0.21    | 0.78                   | 3.02                   |
| Trans*                          |           | 0.35                   | 0.17           | 1.42       | 0.04    | 1.02                   | 1.99                   |
| Non-binary                      |           | 0.39                   | 0.37           | 1.48       | 0.28    | 0.72                   | 3.09                   |
| Inter*                          |           | -0.20                  | 0.65           | 0.81       | 0.75    | 0.20                   | 2.87                   |

Note: ¹ = 5-item short version of World Health Organization-Five Well-Being Index-10.

https://doi.org/10.1371/journal.pone.0252356.t003
final score as the dependent variable revealed that there is a significant negative association between the level of well-being and minoritized sexual identities; in particular cis-asexual individuals, followed by cis-bisexual individuals. Minoritized gender identities, in particular non-binary and trans* individuals, were also negatively associated with well-being. Living in urban communities and being in a relationship were positively association with the level of well-being in this model. All other covariates had no significant effect.

Since the multivariate linear regression analysis showed that the variables relationship status and residential environment have a significant influence on well-being, we explored in a next step whether these variables influence the effect of individual identity on well-being. To test whether relationship status influences the association between minoritized sexual and gender identities (cis-heterosexual vs. LGBTQIA*) and well-being, a moderation analysis was conducted. Results showed a significant positive interaction effect of LGBTQIA* identities and relationship status (see Table 4). Substantively this means, as revealed by the conditional effects, that LGBTQIA* individuals without a partner have particularly low well-being, whereas the gap to cis-heterosexual individuals is narrower for LGBTQIA* individuals with a partner. In other words, the results indicate that the negative association between well-being and LGBTQIA* identities is mitigated by being in a relationship but not erased completely. A further analysis concerning the residential environment showed no moderator effect (see Table 4).

**Discussion**

The present study provides unique evidence on the comparison of well-being among cis-heterosexual individuals and LGBTQIA* individuals during the COVID-19 pandemic. Based on previous literature, we hypothesized overall lower levels of well-being in all individuals during the COVID-19 pandemic compared to levels prior to the COVID-19 pandemic (based on prior empirical work; Hypothesis 1); as well as lower levels of well-being among individuals with minoritized gender and/or sexual identities compared to cis-heterosexual individuals (Hypothesis 2). Further, the influence of age, residential environment, employment status, relationship status, parenthood and COVID-19 status in the association between well-being and sexual and gender identities was explored (Research Question).

First, overall results of the present study confirmed lower levels of well-being in all groups during the COVID-19 pandemic. Comparing these results with data obtained during the validation of the German version of the WHO-5 prior to the COVID-19 pandemic, we found a significant lower overall mean of the well-being score [42]. This finding is in line with our Hypothesis 1 as lower levels of well-being were expected during the current COVID-19 pandemic. A recently published empirical study reporting on mental health during the COVID-19 pandemic in Germany has similarly found an overall decrease in well-being measured with the WHO-5 [43]. In light of staggering preexisting mental health gradients between LGBTQIA* and cis-heterosexual people in Germany—documented just prior to the pandemic [21]—the findings of the current study are alarming.

Second, when comparing well-being levels among all individuals with minoritized gender and sexual identities with cis-heterosexual individuals, results indicated higher levels of well-being among cis-heterosexual individuals compared to LGBTQIA* people. The results were mainly driven by the group of cis-bisexual, cis-asexual and trans* individuals, which showed significant lower levels in well-being compared to participants from the cis-heterosexual group. The finding concerning LGBTQIA* individuals as one group was expected (Hypothesis 2) and is in line with previous empirical work [21]. Research in this field is growing, and the vast majority of studies report significantly poorer well-being and mental health in individuals with minoritized sexual and/or gender identities when compared with heterosexual and
A recent systematic literature review of N = 77 studies reported higher general distress, depressive symptoms, anxiety, suicidality as well as exposure to trauma and substance abuse among LGBTQIA+ individuals [20]. Further, in line with the Minority Stress Model [24,25], EU-LGBTI surveys reported high levels of discrimination in access to and experience with healthcare [48,49]. LGBTQIA+ individuals experience numerous health disparities and poor mental health, especially in times of the COVID-19 pandemic [50].

Another study where mental health of LGBT college students from the U.S. during the COVID-19 pandemic was examined, reported that approximately 60% of the sample were experiencing psychological distress, anxiety, and depression during the pandemic [34].

Our analyses further showed well-being heterogeneity within the LGBTQIA+ group. With regard to sexual identity among cis-individuals, results suggest asexual and bisexual
individuals at particular risk for poor mental health. In addition, the results show that the likelihood of being below the cut-off value for clinically significant depression was significantly increased in bisexual individuals and significantly decreased in heterosexual individuals. This finding is in line with previous empirical work [51–53]. For example, in a systematic review and meta-analysis on the prevalence of depression and anxiety, higher rates of depression and anxiety were consistently reported among bisexual individuals compared to heterosexual individuals and higher or equivalent rates in comparison to lesbian/gay individuals [54].

Notably, we did not find a significant difference between cis-lesbian/gay and cis-heterosexual individuals in regards to clinically significant depression in our data, nor does the effect suggest any sizable difference in means. Existing literature would suggest that lesbian women and gay men have poorer mental health than heterosexual individuals. In light of the mounting evidence that such a well-being gap exists, self-selection into the current study may play a role; specifically, particularly well-adjusted cis-lesbian women and cis-gay men or cis-heterosexual people with particularly poor mental health who dampen the group difference in well-being. Indeed, the sample is made up of many cis-women, whose consistently higher levels of depression than men are well-documented [55]. The sample further contains a noticeably large share of cis-lesbian and cis-gay individuals who are in relationships; also possibly a by-product of the family planning topic. As we have illustrated in this study, having a partner is a factor that minimizes the adverse well-being outcomes, which is another reason that likely led us to underestimate the well-being gap between cis-lesbian/gay individuals compared to cis-heterosexual individuals. In other words, the overall difference we found in this study between cis-heterosexual and LGBTQI+ individuals is likely even more pronounced in general populations with adequate representation of cis men in general and unpartnered cis-gay/lesbian identifying individuals.

Regarding the analyses of individuals with minoritized gender identities, heightened rates of clinical depression among trans’ and non-binary people were found in the regression analyses. These findings mirror the existing literature on mental health disparities of trans’ and gender non-conforming people. For example, a recent study confirmed that due to the COVID-19 pandemic, access to gender-affirming resources and the ability of transgender and non-binary people to live according to their preferred gender has been reduced [56]. While gender-affirming care has repeatedly been found to improve physical and mental health of people with minoritized gender identities [57,58], access to it was already difficult for many individuals. The COVID-19 pandemic created an additional burden. Negative impacts of the pandemic include deferrals of and limited access to gender-affirming treatment (e.g., hormonal treatment, surgery), services (e.g., hair removal, binders) as well as access to mental counseling and psychotherapy, which may be linked to increased depressive symptoms [56]. Further, similar to our results, the same study reported about half of the participants screened positive for clinically significant depression.

With regard to protective factors for well-being, results revealed that being in a partnership and living in urban areas are relevant for well-being for all individuals in general, and particularly so for LGBTQIA+ individuals. Interestingly, these significant protective factors for well-being, can also be interpreted as protective factors within the Minority Stress Model [20,25]. The protective role of being in a romantic partnership has already been reported in the past [35,37]. Further, previous literature has acknowledged social support [59–61] and in particular romantic relationships [58,62], to be associated with higher levels of wellbeing and mental health among individuals with minoritized gender and sexual. In addition, results of the present study indicate the negative association between LGBTQIA+ identities and well-being is mitigated by being in a relationship. Future research should focus more closely on examining the buffering role of romantic relationships in the association between individuals with
minoritized gender and sexual identities and well-being. With regard to living in urban areas, past research has repeatedly found that individuals of LGBTQIA+ communities from rural areas experience high negative mental health consequences of minority stress [63]. Further, rural residents in general, but especially individuals from LGBTQIA+ communities, report barriers and difficulties in the access of mental healthcare, among others because mental health services are in short supply [64]. The current COVID-19 pandemic and its restrictions represent an additional burden to healthcare access, especially for LGBTQIA+ communities.

To sum up, results of the present study underline the particular vulnerability of LGBTQIA+ individuals during the COVID-19 pandemic. In order to improve well-being and mental health among this group, access to mental healthcare should be strengthened during the COVID-19 pandemic, especially in rural areas. Healthcare services with low barriers of access such as telehealth, online care programs, counseling and supervision, as well as training and psychoeducation through online platforms should be made readily available. Telehealth has been found to be effective and practically feasible for the provision of mental health service during this pandemic [65]. Another recent study concluded that telehealth not only constitutes an effective health service but also has the potential of rapid implementation in both metropolitan and rural areas. Thus, access to telehealth during pandemics should be facilitated, particularly to vulnerable communities at higher risk of poor mental health. Moreover, access to gender-affirming services should not be disrupted in this time but rather strengthened. This study has substantial strengths including the use of a large and nationwide sample with high participation rates of LGBTQIA+ individuals. It is the first study of its kind which examined well-being among LGBTQIA+ individuals compared to cis-heterosexual individuals during the COVID-19 pandemic. However, the following limitations exist. First, well-being was measured by self-report. Self-reports of mental health may differ from clinical diagnoses. For instance, Grobe et al. [66] found administrative diagnoses within the healthcare system showed higher rates compared with survey self-reported depressive symptoms. However, self-perceptions of mental health have their own right as they are related to mental components of subjective well-being. Future research should incorporate clinical diagnosis or administrative data of mental health problems in order to assess mental health more objectively. Secondly, in the current study, LGBTQIA+ individuals—in particular cis-lesbian and cis-gay identifying individuals—who are in relationships are overrepresented. The detected differences in well-being are likely more pronounced in the general population of LGBTQ+ people than the current study shows. Third, while this is the first study to examine well-being among LGBTQIA+ individuals compared to cis-heterosexual individuals during the COVID-19 pandemic, data were obtained at a single time point. Therefore, no trends or within-person comparisons of mental health before and after the COVID-19 pandemic can be drawn. A larger number of observations of trans’ and gender non-conforming individuals would allow for further distinction of this group, according to their sexual orientation, which may interact with minoritized gender identities in unique ways. Further, as the present study is a cross-sectional study only, associations and not causations can be inferred from the data. Future research on well-being of individuals with minoritized sexual and gender identities during pandemics should focus on longitudinal research.

Conclusion

The present study’s findings reveal lower levels of well-being among all participants compared to research conducted before the COVID-19 pandemic. Levels of well-being were lower among individuals with minoritized sexual and gender identities compared to cis-heterosexual individuals. Further, results indicate a protective role of being in a partnership and living in an
urban area. Access to mental healthcare and gender-affirming resources for LGBTQIA+ individuals should be strengthened during the COVID-19 pandemic. Healthcare services with low barriers of access such as telehealth and online peer support groups should be made readily available, especially for vulnerable groups.

Supporting information

S1 Dataset.
(SAV)

Acknowledgments

We would like to thank Grace O’Malley (Department of Paediatric Oncology/Haematology, Charité – Universitätsmedizin Berlin, Campus Virchow-Klinikum, Berlin, Germany) for proofreading the manuscript.

Author Contributions

Conceptualization: Pichit Buspavanich, Sonia Lech, Eva Lermer, Mirjam Fischer, Maximilian Berger, Theresa Vilsmaier, Till Kaltofen, Simon Keckstein, Sven Mahner, Joachim Behr, Christian J. Thaler, Falk Batz.

Formal analysis: Pichit Buspavanich, Sonia Lech, Eva Lermer, Falk Batz.

Project administration: Pichit Buspavanich, Falk Batz.

Supervision: Pichit Buspavanich, Falk Batz.

Writing – original draft: Pichit Buspavanich, Sonia Lech, Falk Batz.

Writing – review & editing: Pichit Buspavanich, Sonia Lech, Eva Lermer, Mirjam Fischer, Maximilian Berger, Theresa Vilsmaier, Till Kaltofen, Simon Keckstein, Sven Mahner, Joachim Behr, Christian J. Thaler, Falk Batz.

References

1. Coronavirus Disease (COVID-19) Dashboard. [Internet]. 2020. Available from: https://covid19.who.int/ (accessed on 28.02.2021).

2. Spiteri G, Fielding J, Diercke M, Campese C, Enouf V, Gaymard A, et al. First cases of coronavirus disease 2019 (COVID-19) in the WHO European Region, 24 January to 21 February 2020. Eurosurveillance. 2020; 25(9):2000178. https://doi.org/10.2807/1560-7917.ES.2020.25.9.2000178 PMID: 32156327

3. Ammar A, Chtourou H, Boukhris O, Trabelsi K, Masmoudi L, Brach M, et al. COVID-19 home confinement negatively impacts social participation and life satisfaction: a worldwide multicenter study. International journal of environmental research and public health. 2020; 17(17):6237. https://doi.org/10.3390/ijerph17176237 PMID: 32867287

4. Ackeren IV, Endberg M, Locker-Grütjen O. Chancenausgleich in der Corona-Krise. Die soziale Bildungsschere wieder schließen. Die deutsche Schule. 2020; 112(2):245–8.

5. Holst H, Fessler A, Niehoff S. Covid-19, social class and work experience in Germany: inequalities in work-related health and economic risks. European societies. 2021; 23(S1):S495–S512.

6. Pusch T, Seifert H. Stabilising Effects of Short-Time Work During the Corona Pandemic in Germany. Wirtschaftsdienst (Hamburg). 2021; 101(2):99. https://doi.org/10.1007/s10273-021-2850-4 PMID: 33642646

7. BMBF. German Federal Ministry of Education and Research (BMBF). Interim financial aid for students: what you need to know. Accessed on 22.04.2021. 2020.

8. BMFSFJ. German Federal Ministry for Family Affairs, Senior Citizens, Women and Youth. Pressemitteilung vom 12.06.2020. Kabinett beschließt Kinderbonus für jedes Kind. Accessed on 22.04.2021. 2020.
9. Yuksel B, Ozgor F. Effect of the COVID-19 pandemic on female sexual behavior. International Journal of Gynecology & Obstetrics. 2020; 150(1):98–102. https://doi.org/10.1002/ijgo.13193 PMID: 32392400
10. Bavel JJV, Baicker K, Boggio PS, Capraro V, Cichocka A, Cikara M, et al. Using social and behavioural science to support COVID-19 pandemic response. Nature Human Behaviour. 2020; 4(5):460–71. https://doi.org/10.1038/s41562-020-0884-z PMID: 32355299
11. Brooks SK, Webster RK, Smith LE, Woodland D, Wessely S, Greenberg N, et al. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. The Lancet. 2020; 395(10227):912–20.
12. Panzeri M, Ferrucci R, Cozza A, Fontanesi L. Changes in sexuality and quality of couple relationship during the Covid-19 lockdown. Frontiers in psychology. 2020;11. https://doi.org/10.3389/fpsyg.2020.00111 PMID: 32063872
13. Banerjee D. How COVID-19 is overwhelming our mental health. Nature India. 2020: 2020.
14. Ammar A, Mueller P, Trabelsi K, Chitourou H, Bokhris O, Masmoudi L, et al. Emotional consequences of COVID-19 home confinement: The ECLB-COVID19 multicenter study. medRxiv. 2020. https://doi.org/10.1371/journal.pone.0240204 PMID: 33152030
15. Wang C, Pan R, Wan X, Tan Y, Xu L, Ho CS, et al. Immediate Psychological Responses and Associated Factors during the Initial Stage of the 2019 Coronavirus Disease (COVID-19) Epidemic among the General Population in China. International journal of environmental research and public health. 2020; 17(5):1729. https://doi.org/10.3390/ijerph17051729 PMID: 32155789
16. Qiu J, Shen B, Zhao M, Wang Z, Xie B, Xu Y. A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: implications and policy recommendations. General psychiatry. 2020; 33(2):e100213. https://doi.org/10.1136/gpsych-2020-100213 PMID: 32215365
17. Ko N-Y, Lu W-H, Chen Y-L, Li D-J, Chang Y-P, Wu C-F, et al. Changes in Sex Life among People in Taiwan during the COVID-19 Pandemic: The Roles of Risk Perception, General Anxiety, and Demographic Characteristics. International journal of environmental research and public health. 2020; 17(16):5822.
18. Baptiste-Roberts K, Oranuba E, Werts N, Edwards LV. Addressing Health Care Disparities Among Sexual Minorities. Obstet Gynecol Clin North Am. 2017; 44(1):71–80. https://doi.org/10.1016/j.ogc.2016.11.003 PMID: 28160894
19. Bockting WO, Miner MH, Swinburne Romine RE, Hamilton A, Coleman E. Stigma, mental health, and resilience in an online sample of the US transgender population. Am J Public Health. 2013; 103(5):943–51. https://doi.org/10.2105/AJPH.2013.301241 PMID: 23488522
20. Valentine SE, Shipherd JC. A systematic review of social stress and mental health among transgender and gender non-conforming people in the United States. Clin Psychol Rev. 2018; 66:24–38. https://doi.org/10.1016/j.cpr.2018.03.003 PMID: 29627104
21. Kasprzowski D, Fischer M, Chen X, de Vries L, Kroh M, Kühne S, et al. LGBTQI* People in Germany Face Staggering Health Disparities. DIW Weekly Report. 2021; 11(5/6):42–50.
22. Eurosurveillance editorial team. The European Union Agency for Fundamental Rights publishes the European Union lesbian, gay, bisexual and transgender survey. Eurosurveillance. 2020, 18(22):20492. PMID: 23787083
23. van Trotsenburg M. Aktuelle Dilemmata der Transgendermedizin. Journal für Klinische Endokrinologie und Stoffwechsel. 2019; 12(3):95–101.
24. Testa RJ, Habarth J, Peta J, Balsam K, Bockting W. Development of the Gender Minority Stress and Resilience Measure. Educational Publishing Foundation, 2015. p. 65–77.
25. Meyer IH. Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: conceptual issues and research evidence. Psychol Bull. 2003; 129(5):674–97. https://doi.org/10.1037/0033-2909.129.5.674 PMID: 12956539
26. Rees SN, Crowe M, Harris S. The lesbian, gay, bisexual and transgender communities’ mental health care needs and experiences of mental health services: An integrative review of qualitative studies. J Psychiatr Ment Health Nurs. 2020. https://doi.org/10.1111/jpm.12720 PMID: 33295065
27. Lewis NM. Mental health in sexual minorities: Recent indicators, trends, and their relationships to place in North America and Europe. Health & Place. 2009; 15(4):1029–45.
28. Marshall MP, Dietz LJ, Friedman MS, Stall R, Smith HA, McGinley J, et al. Suicide and Depression Disparities Between Sexual Minority and Heterosexual Youth: A Meta-Analytic Review. Journal of Adolescent Health. 2011; 49(2):115–23. https://doi.org/10.1016/j.jadohealth.2011.02.005 PMID: 21783042
29. Cochran SD, Sullivan JG, Mays VM. Prevalence of mental disorders, psychological distress, and mental health services use among lesbian, gay, and bisexual adults in the United States. Journal of consulting and clinical psychology. 2003; 71(1):53. https://doi.org/10.1037/0022-006x.71.1.53 PMID: 12602425
30. Reisner SL, Vettese L, Leclerc M, Zaslowsky N. Mental Health of transgender youth in care at an adolescent urban community health center: a matched retrospective cohort study.
31. Pöge K, Dennert G, Koppe U, Güldenring A, Matthigack EB, Rommel A. The health of lesbian, gay, bisexual, transgender and intersex people. Journal of Health Monitoring. 2020; 2020(S2):1–27.

32. Nicole D. The Visual Politics of the Alternative for Germany (AfD): Anti-Islam, Ethno-Nationalism, and Gendered Images. Social sciences (Basel). 2021; 10(1):20.

33. Salerno JP, Williams ND, Gattamorta KA. LGBTQ populations: Psychologically vulnerable communities in the COVID-19 pandemic. Psychological trauma: theory, research, practice and policy. 2020; 12(S1):S239–s42. https://doi.org/10.1037/tra0000837 PMID: 32551761

34. Gonzales G, Loret de Mola E, Gavulic KA, McKay T, Purcell C. Mental Health Needs Among Lesbian, Gay, Bisexual, and Transgender College Students During the COVID-19 Pandemic. Journal of Adolescent Health. 2020; 67(5):645–8.

35. Busch MA, Maske UE, Ryl L, Schlack R, Hapke U. Prävalenz von depressiver Symptomatik und diagnostizierter Depression bei Erwachsenen in Deutschland. Bundesgesundheitsblatt-Gesundheitsforschung-Gesundheitsschutz. 2013; 56(5–6):733–9. https://doi.org/10.1007/s00103-013-1688-3 PMID: 23703492

36. Erhart M, von Stillfried D. Analyse regionaler Unterschiede in der Prävalenz und Versorgung depressiver Störungen auf Basis vertragsärztlicher Abrechnungsdaten–Teil 1 Prävalenz. Berlin: Zentralinstitut für die kassenärztliche Versorgung in Deutschland. 2012.

37. Bulloch AG, Williams JV, Lavorato DH, Patten SB. The depression and marital status relationship is modified by both age and gender. Journal of affective disorders. 2017; 223:65–8. https://doi.org/10.1016/j.jad.2017.06.007 PMID: 28732242

38. Gariepy G, Honkanieri M, Quesnel-Vallee A. Social support and protection from depression: systematic review of current findings in Western countries. The British Journal of Psychiatry. 2016; 209(4):284–93. https://doi.org/10.1192/bjp.bp.115.169094 PMID: 27443555

39. Thom J, Kuhnert R, Born S, Hapke U. 12-Monats-Prävalenz der selbstberichteten ärztlich diagnostizierten Depression in Deutschland. 2017.

40. Rommel A, Bretschneider J, Kroll LE, Prütz F, Thom J. Inanspruchnahme psychiatrischer und psychotherapeutischer Leistungen—Individuelle Determinanten und regionale Unterschiede. 2017.

41. World Health Organization. Well-Being Measures in Primary Health Care—the DepCare Project. WHO Regional Office for Europe: Copenhagen. 1998.

42. Brähler E, Mühlau H, Albani C, Schmidt S. Teststatistische prüfung und normierung der deutschen versionen des EUROHIS-QOL lebensqualitaet-Index und des WHO-5 wohlbefindens-index. Diagnostica. 2007; 53(2):83–96.

43. Jung S, Kneer J, Krüger THC. Mental Health, Sense of Coherence, and Interpersonal Violence during the COVID-19 Pandemic Lockdown in Germany. Journal of clinical medicine. 2020; 9(11).

44. McNeil J, Ellis SJ, Eccles FJ. Suicide in trans populations: A systematic review of prevalence and correlates. Psychology of Sexual Orientation and Gender Diversity. 2017; 4(3):341.

45. Boehmer U, Clark MA, Lord EM, Fredman L. Caregiving Status and Health of Heterosexual, Sexual Minority, and Transgender Adults: Results From Select U.S. Regions in the Behavioral Risk Factor Surveillance System 2015 and 2016. Gerontologist. 2018; 59(4):760–9. https://doi.org/10.1093/geront/gny109 PMID: 30215703

46. Ploöerl M, Tremblay P. Mental health of sexual minorities. A systematic review. International review of psychiatry. 2015; 27(5):367–85. https://doi.org/10.3109/09540261.2015.1083949 PMID: 26552495

47. Wiepjes CM, den Heijer M, Bremmer MA, Nota NM, de Blok CJM, Coumou BJG, et al. Trends in suicide death risk in transgender people: results from the Amsterdam Cohort of Gender Dysphoria study (1972–2017). Acta Psychiatrica Scandinavica. 2020; 141(6):486–91.

48. European Union Agency for Fundamental Rights EU-LGBTII. A long way to go for LGBTI equality. Luxembourg: Publications Office of the European Union2020.

49. European Union Agency for Fundamental Rights EU LGBT survey. European Union lesbian, gay, bisexual and transgender survey. Luxembourg: Publications Office of the European Union2014.

50. Wang Y, Shi L, Que J, Lu Q, Liu L, Lu Z, et al. The impact of quarantine on mental health status among general population in China during the COVID-19 pandemic. Molecular Psychiatry. 2021. https://doi.org/10.1038/s41380-021-01019-y PMID: 33483692

51. McInroy LB, Beaujolais B, Leung VW, Craig SL, Eaton AD, Austin A. Comparing asexual and non-asexual sexual minority adolescents and young adults: stressors, suicidality and mental and behavioural health risk outcomes. Psychology & Sexuality. 2020:1–17.
