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Coping strategies during legally enforced quarantine and their association to psychological distress level: a cross-sectional study

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Abstract

Objectives: The non-pharmacological measures to contain the COVID-19 pandemic may lead to considerable psychological distress. The aim of the CoCo-Fakt study was to investigate possible coping strategies and their effects on psychological distress during legally enforced quarantine of infected persons (IPs) and their close contacts (CPs).

Study design: This was a cross-sectional cohort study.

Methods: From 12 December 2020 to 6 January 2021, all IPs and their CPs (n = 8232) registered by the public health department (Cologne, Germany) were surveyed online. Psychosocial distress and coping were measured using sum scores; free-text answers related to specific strategies were subsequently categorised.

Results: Psychosocial distress was higher in IPs than in CPs (P < .001). Although the mean coping score did not differ between both groups, it was influenced by the reason for quarantine (IP vs CP) besides gender, age, socio-economic status, living situation, psychological distress, resilience, physical activity and eating behaviour. This final regression model explained 25.9% of the variance. Most participants used active coping strategies, such as contact with the social environment, a positive attitude and hobbies.

Conclusions: Although psychological distress was higher in IPs than in CPs during the quarantine period, the mean coping score did not differ. The strategies most frequently used by IPs and CPs were activating social networks, a healthy lifestyle and professional support systems, such as the health department helpline. Appropriate advice should be implemented to prevent long-term psychological consequences when supporting affected people.
public health measures (e.g. quarantine and stay-at-home order) on anxiety and depression symptomatology, health anxiety, loneliness, the occurrence of fearful spells, psychosocial distress and life satisfaction. Higher restrictions due to lockdown measures, a greater reduction of social contacts and greater perceived changes in life were associated with higher mental health impairments. Noteworthy, an officially announced stay-at-home order was not associated with poorer mental health; but in their study, only 28.4% (n = 1187) were mandatory quarantined. Other studies by Kolodziyczyk et al. and by the TMGH-Global COVID-19 Collaborative, in turn, were able to show significantly poorer mental health in people who were quarantined as an infected person (IP) or a close contact (CP).10 Psychopathological symptoms such as anxiety, insomnia and hyperarousal were much more frequent in this group.10 The extent to which psychological well-being, and thus long-term psychological outcome, is affected by a stressor may depend on the use of positive or negative coping strategies.14 However, even the designation or conceptualisation of coping is challenging.13 The most commonly used definition by Lazarus and Folkman describes coping as a cognitive or behavioural reaction to manage a situation.14 Mostly coping is categorised in two main dimensions: problem-oriented coping and emotion-oriented coping.15 The starting points are the relationship to the surroundings and the interpretation of these, respectively. This can be supplemented by the perspective of distraction, which can be social as well as task oriented.16 Skinner et al., on the other hand, call for a revision of the previous classification towards a multidimensional and hierarchical system.13 Nevertheless, given the complexity and lack of comparability to other studies, this model is not applied in our study.

Park et al. analysed the use and impact of different coping mechanisms during the onset of the COVID-19 pandemic in April 2020 in the United States. The most frequently cited strategies were distracting oneself, seeking emotional-social support and active problem-focused coping.17 Saalwirth et al. also examined the effects of coping strategies in spring 2020 in Germany via online questionnaire. The results show that meaning- and problem-focused coping were used most frequently. These types of coping were positively associated with positive affect. In contrast, social and avoidance coping showed a positive relationship to negative affect.18 Budimir et al. identified positive thinking as the strongest positive predictor for all measured mental health scales, including quality of life or depression.19 In a study by Golemis et al. from Greece, sharing thoughts and feelings with others about COVID-19 was reported as the most frequently used mechanism.20 Along with sports and humour, this predicted lower levels of loneliness.20 However, in these studies on coping, the term quarantine was used to refer to general isolation measures of the general population. So far, however, no studies have analysed the use of coping strategies in the context of a mandatory stay-at-home order and the relationship with psychosocial distress considering IPs and CPs in Germany. Therefore, the aim of the CoCo-Fakt study (Cologne−Corona Counselling and Support For Index and KontAKt Persons During the Quarantine Period) was to examine (1) the overall coping score and (2) type and frequency of coping strategies of officially quarantined IPs and CPs. (3) Additional factors influencing coping such as sociodemographic variables, psychological distress and/or resilience were also identified to develop recommendations for action during the quarantine period counteracting possible long-term psychological consequences.

Methods

Study design/study population

Since the occurrence of the first COVID-19 infection in Cologne at the end of February 2020, all people who tested positive for SARS-CoV-2 (IPs) in the urban area of Cologne were reported to the Cologne Health Department and quarantined based on the legal regulations for the control of infectious diseases defined by the Infection Protection Act. For this purpose, these people are contacted, registered in the database of the Cologne public health department's digital contact management (DiKoMa) system21 and questioned in a standardised manner about possible infection routes, chronic diseases and risk factors. In addition, close contacts (CPs) are also quarantined to interrupt infection chains. CPs are defined as those who have had close exposure to a confirmed COVID-19 case (<1.5 m) for a duration longer than 10 min without a mask within a time frame ranging from 2 days before symptom onset in the index case to 10 days after symptom onset. The quarantine duration was usually 10–14 days from the time of symptom onset or positive test in IPs and from the last contact in CPs.

All individuals enrolled before and on 9 December 2020 were extracted from this data set; individuals aged <16 years, those with no informed consent, non-compliance, deceased patients and those who were placed in medical or nursing facilities were excluded. Pregnant women received a modified online questionnaire.22 From 12 December 2020 to 6 January 2021, the link to the online survey was emailed to 33,699 people. This link was clicked on by 13,057 people. After cleaning the data, only people who provided information on coping strategies were integrated into this evaluation (n = 8232; see Fig. 1: Study population).

Questionnaire

The online questionnaire was programmed with Unipark. It included both quantitative and qualitative parameters and was based on the COVID-19 snapshot study conducted by Betsch et al. and the World Health Organisation.23 Participants were explicitly informed of the period to which each question referred, for example, general data, such as education, exercise behaviour before the pandemic, psychological distress or coping strategies during the legally mandated quarantine.

Demographic data

Information was collected on age (years) and gender (male/female). Educational status was calculated according to years of schooling completed (<10 years corresponds to low socio-economic status [SES], 10 years to medium SES and >10 years to high SES).24 Conclusions about migration background were based on the primary language spoken at home (No = speak German at home and Yes = speak a language other than German).

Personal situation

Information was collected regarding the presence of chronic diseases,25 the housing situation (house/flat with garden and/or balcony vs no balcony/no garden), the composition of the household (partner and children) and the symptom burden (only for infected people). The quarantine duration was measured in days.

Psychological distress

Five items from the COVID-19 Snapshot Monitoring study (COSMO) were integrated:26

- ‘I felt nervous, anxious or tense’27 (Item 1, Generalised Anxiety Disorder Scale-7 [GAD-7])
- ‘I felt down/depressed’28,29 (Item 6, Generalised Depression Scale [ADS])
- ‘I felt lonely’28,29 (Item 14, ADS)
- ‘I thought of the future with hope’28,29 (Item 8, ADS)
Thoughts of my experience in the Corona pandemic triggered physical reactions in me, such as sweating, shortness of breath, dizziness or palpitations (Item 19, IES-R). Responses were given on a 6-point Likert scale from 'not at all/less than 1 day' to 'always/daily' and regrouped into 'not at all', '1–2 days', '3–4 days' and '5–7 days' during time of quarantine. Some items were recoded in reverse terms so that all items could then be combined into a total relative sum score related to the number of questions to estimate the overall reported psychological distress in accordance with the COSMO study. A high score represents a high level of psychological distress. The present study found a Cronbach's alpha coefficient of 0.694 for the psychological distress score and reliabilities of the individual questions ranging from 0.532 to 0.781. A value higher than 0.70 would be ideal, a value of internal consistency close to 0.60 is satisfactory in terms of a screening tool with five questions. The complete instructions of the GAD, ADS and IES-R can be found in the respective manuals.

Resilience

Resilience was measured via six items with the Brief Resilience Scale (BRS; e.g. 'I do not need much time to recover from a stressful event'), ranging from 'I strongly disagree' (1) to 'I strongly agree' (6). In addition, some items that asked about the current quarantine situation were used (e.g. 'I know I will not be discouraged'). After recoding, a relative sum score after Smith et al. related to the number of questions was formed in accordance with the COSMO study, with a high score representing high resilience.
The present study found a Cronbach’s alpha coefficient of 0.812 for the BRS.

Coping strategies
The application of coping strategies and the use of support systems were investigated with the help of six items, following the COSMO study:

- ‘I have received offers of support from family, friends or neighbours.’\(^{20}\) (Item 2, Federal Centre for Health Education [BZgA] – coping)
- ‘I had a plan for my daily life in terms of sleep, work or physical activities.’\(^{20}\) (Item 4, BZgA – coping)
- ‘I discovered activities for myself that made staying at home easier.’\(^{20}\) (Item 6, BZgA – coping)
- ‘I have used digital media to communicate with family, friends and acquaintances.’\(^{20}\) (Item 1, BZgA – coping, modified)
- ‘I was bored.’\(^{20}\) (Item 7, BZgA – coping)
- ‘I couldn’t do anything myself to influence the situation positively.’\(^{20}\) (Item 2, solidarity)

Here, too, a 6-point Likert scale was used to collect responses, and a sum score was formed after recoding. A high score equates to increased use of coping strategies. The present study found a Cronbach’s alpha coefficient of 0.685 for the coping score and the individual questions ranging from 0.599 to 0.684. Again a value higher than 0.70 would be ideal, a value of internal consistency close to 0.60 is satisfactory in terms of a screening tool with a value between 1 and 3 on the scale were rated as “not applicable” and statements 4–6 as “applicable”.

Answers to the open question ‘What helped you most?’ were administered and analysed with MAXQDA 2020 (VERBI software) following a deductive approach.\(^{35,36}\) After an initial coding scheme derived from the given topics of the questionnaire, it was applied to the transcripts by two coders, and emerging themes were identified based on an inductive approach. Discrepancies in coding were resolved by consensus.\(^{37}\) Finally, 23 relevant categories were identified through selective coding compared with the literature and the COSMO study\(^{38}\) (see Supplemental material 1). Due to the multiplicity of these answers, the evaluation was exclusively descriptive (Table 4).

Exercise and eating behaviour
A yes/no question about exercise/physical activity during quarantine was included. Eating behaviour was assessed via a Healthy Eating Index. This index was calculated by summing the positive and negative responses from the following three categories: change in mealtime (four items), change in frequency (four items) and change in food (14 items). The score for change in meal time could take a value between 1 and 3; the score for change in frequency, a value between 1 and 5; and the score for change in food, a value between 1 and 2. These individual scores were then summed, a total percentage score was calculated based on the points to be achieved, and terciles were formed (>0.75 corresponded to eating healthier; 0.65–0.75 to no change; and <0.65, to eating less healthily).

Table 1
Demographic data.

| Variables                        | Total | IP   | CP   | P value IP vs CP | Effect size |
|----------------------------------|-------|------|------|------------------|-------------|
| N                                | 8232  | 3256 | 4976 | <.001*            | .067*       |
| Sex, n (%)                       |       |      |      |                  |             |
| Female                           | 5062  | 1871 | 3191 | (.056)           |             |
| Male                             | 3170  | 1385 | 1785 | (.041)           |             |
| Age (years)                      |       |      |      |                  |             |
| Mean (SD)                        | 41.6  | 42.6 | 40.9 | (.014)           | .103*       |
| Range                            | 16–93 | 16–87| 16–93|                  |             |
| Quarantine interval in days      |       |      |      |                  |             |
| Mean (SD)                        | 11.8  | 12.1 | 11.6 | (.013)           | .122*       |
| Range                            | 1–42  | 1–42 | 1–42 |                  |             |
| Migration background, n (%)      |       |      |      |                  |             |
| Yes                              | 404   | 207  | 197  | (.014)           | .056*       |
| No                               | 7695  | 2977 | 4718 | (.001)           | .033*       |
| Education level, n (%)           |       |      |      |                  | .029*       |
| Low                              | 68    | 34   | 34   | (.016)           |             |
| Middle                           | 1510  | 628  | 882  | (.013)           |             |
| High                             | 6600  | 2569 | 4031 | (.004)           |             |
| Household structure              |       |      |      |                  |             |
| Partner, n (%)                   |       |      |      |                  | .063* n.s.  |
| Yes                              | 5744  | 2303 | 3441 | (.009)           |             |
| No                               | 2301  | 871  | 1430 | (.004)           | .030*       |
| Children, n (%)                  |       |      |      |                  |             |
| Yes                              | 3582  | 1476 | 2106 | (.005)           | .040*       |
| No                               | 4620  | 1765 | 2855 | (.004)           |             |
| Living situation, n (%)          |       |      |      |                  |             |
| Garden                           | 1832  | 683  | 1149 | (.005)           | .005*       |
| Balcony                          | 4093  | 1675 | 2418 | (.005)           |             |
| Garden and balcony               | 1022  | 424  | 598  | (.005)           |             |
| None of them                     | 1259  | 463  | 796  | (.005)           |             |
| Chronic diseases, n (%)          |       |      |      |                  |             |
| Yes                              | 1804  | 757  | 1047 | (.013)           | .013*       |
| No                               | 6148  | 2380 | 3768 | (.005)           | .028*       |

* Chi-square test.
\(^{1}\) Cramer’s V.
\(^{2}\) Independent t-test; significance level set at <.05.
\(^{3}\) Cohen’s d.
\(^{4}\) SD is standard deviation.
\(^{5}\) According to chi-square test for SES low vs SES medium to high.
**Data analysis**

The data analysis was carried out descriptively and inductively with the programme SPSS 27.0. Univariable differences were examined with the help of chi-square tests and t-tests. Effect sizes were calculated using Cohen’s d (independent t-test; trivial: <0.2; small: 0.2–0.5; moderate: 0.5–0.8; large: ≥0.8) or Cramer’s V (chi-square test; small: 0.06–0.15; moderate: 0.16–0.26; large: ≥0.26) for significant differences in scores and coping answers between IPs and CPs. Multiple linear regression was used to examine possible influencing factors on the coping score. The considered variables contained in our full model were quarantine as IP (=1) or CP (=2), sex (female = 1 and male = 2), age (in years), migration background (no = 1, yes = 2), SES (low and middle = 1 vs high = 2), presence of chronic diseases (yes = 1, no = 2), living situation with balcony and/ or garden vs no access to outdoors (yes = 0, no = 1), living with a partner (yes = 1, no = 2) or children (yes = 1, no = 2), psychological distress score, BRS score, physical activity (yes = 1, no = 2) and healthy eating (unhealthier = 1 vs healthier or no change = 2). Variables not contributing to the regression equation were removed via backward elimination. The significance level was set at α = .05.

**Results**

**Study population and demographic data**

Of the 8232 subjects included, 3256 (39.6%) tested positive for COVID-19, and 4976 (60.4%) were quarantined because they were IPs and 64.1% of the CPs. The mean age was 41.6 years (±14.2), and the mean quarantine duration was 11.8 days (±4.6) (see Table 1).

| Categories | Value a | Effect size b |
|------------|---------|---------------|
| Sum scores of coping strategies, resilience and psychological distress | | |
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Increased from 51.8% to 56.3%. Coping strategies that decreased over time included having a daily routine (57%), praying (70%) and music (45%) as other coping strategies. Having a daily routine (57%), praying (70%) and music (45%) were also reported as other coping strategies.

The vast majority, 80.6%, reported that they perceived support from family and friends. Having a daily routine (57%), praying (70%) and music (45%) were also reported as other coping strategies.

In our study, a higher coping score was associated with female gender, higher age, the quarantine reason ‘tested positive’, a higher SES and resilience score as well as lower psychological distress during stay-at-home order. In addition, a healthy lifestyle, that is, a healthy diet or physical activity during quarantine, had a positive effect on the coping score. Thus, this study at least partially confirms already existing results. In a population-based study by Iddi et al. education and economic class were also significantly related with coping.

Furthermore, especially emotion-focused and problem-focused coping strategies were associated with positive moods, whereas dysfunctional coping strategies were associated with negative moods and higher levels of worry. In contrast, physical activity, following a routine and pursuing hobbies were negatively correlated with depression, anxiety and acute stress symptoms. Adaptive coping strategies such as acceptance, reframing and a sense of humour, as well as seeking emotional support showed a negative correlation to psychopathological symptoms.

Moreover, in the overall view of our results, a key function of the health department or care during the quarantine period can be inferred. Being a central contact, the health department has, on the one hand, an advisory function. By addressing possible coping strategies and providing hints to do things such as activating their social networks, citizens’ intrinsic coping strategies and resources could be activated. Recommendations regarding a healthy lifestyle such as exercising or using relaxation techniques during the quarantine period should also be addressed in the care. In addition, the office can function as a mediator. It could establish connections between those affected and external support systems, such as everyday or neighbourhood helpers who can ensure that those affected are cared for.

The results of the COSMO study showed a decrease in the use of coping strategies and general life satisfaction and a simultaneous increase in boredom and perceived helplessness between March 2020 and March 2021. Coping strategies that decreased over time included using the telephone or social media, making plans for daily life and implementing new activities to facilitate staying at home. Furthermore, both offering and receiving support diminished. In the same period, the self-reported perception of stress increased from 51.8% to 56.3%.

We did not observe a significant difference in the use of coping strategies between men and women, but more women reported that they perceived support from family and friends.

Table 3

| Categories                                  | IP   | n   | %   | CP   | n   | %   |
|---------------------------------------------|------|-----|-----|------|-----|-----|
| Contact with social environment             | 1943 | 47.9| 2489| 39.1 |     |     |
| Offering help/responsibility for others     | 507  | 12.5| 800 | 12.6 |     |     |
| Daily structure                             | 412  | 10.2| 822 | 12.9 |     |     |
| Attitude                                    | 59   | 1.5 | 245 | 3.8  |     |     |
| Exercise/physical activity                  | 61   | 1.5 | 104 | 1.6  |     |     |
| Alcohol/drugs                               | 55   | 1.4 | 188 | 3    |     |     |
| Healthy nutrition                           | 28   | 0.7 | 45  | 0.7  |     |     |
| Hobbies                                     | 15   | 0.4 | 33  | 0.5  |     |     |
| Being outside                               | 13   | 0.3 | 33  | 0.5  |     |     |
| Avoiding messages related to COVID-19       | 5    | 0.1 | 3   | 0.1  |     |     |
| Medical care                                | 217  | 5.4 | 301 | 4.7  |     |     |
| Securing supplies (food, etc.)              | 183  | 4.5 | 561 | 8.8  |     |     |
| Financial security                          | 99   | 2.4 | 53  | .8   |     |     |
| Work/education                              | 87   | 2.1 | 22  | 0.4  |     |     |
| Categories that cannot be influenced        | 44   | 1.1 | 78  | 1.2  |     |     |
| Symptom and risk factors                    | 118  | 2.9 | 94  | 1.5  |     |     |
| Weather                                    | 111  | 2.7 | 258 | 4.1  |     |     |
| Housing situation                           | 41   | 1   | 85  | 1.3  |     |     |
| Transmission                                | 22   | 0.5 | 7   | 0.1  |     |     |
| Tests                                      | 6    | 0.2 | 40  | 0.6  |     |     |
| Length of quarantine                        | 1    | 0   | 67  | 1.1  |     |     |
| No answer provided                          | 29   | 0.7 | 46  | 0.7  |     |     |
| Other/not attributable                      | 3    | 0.1 | 2   | 0    |     |     |

\(^a\) Chi-square test; significance level set at \(p \leq 0.05\).

\(^b\) Cramer’s V.

Table 4

| Categories                                  | IP   | n   | %   | CP   | n   | %   |
|---------------------------------------------|------|-----|-----|------|-----|-----|
| I do not agree at all' (1)                  | 91   | 2.8 | 72  | 2.2  |     |     |
| I had a plan for my daily life in terms of sleep, work or physical activities | 225  | 4.5 | 150 | 3.0  |     |     |
| I discovered activities for myself that made staying at home easier | 449  | 13.9| 283 | 8.7  |     |     |
| I couldn't do anything myself to influence the situation positively | 462  | 9.3 | 313 | 6.3  |     |     |
| I was bored.                                | 89   | 2.7 | 86  | 2.7  |     |     |
| I discovered activities for myself that made staying at home easier | 474  | 14.7| 324 | 10.1 |     |     |
| I have used digital media to communicate with family, friends and acquaintances | 546  | 11.0| 476 | 9.6  |     |     |
| I was bored.                                | 89   | 2.7 | 86  | 2.7  |     |     |
| I discovered activities for myself that made staying at home easier | 474  | 14.7| 324 | 10.1 |     |     |
| I have used digital media to communicate with family, friends and acquaintances | 546  | 11.0| 476 | 9.6  |     |     |

In the same period, the self-reported perception of stress increased from 51.8% to 56.3%.

In our study, a higher coping score was associated with female gender, higher age, the quarantine reason ‘tested positive’, a higher SES and resilience score as well as lower psychological distress during stay-at-home order. In addition, a healthy lifestyle, that is, a healthy diet or physical activity during quarantine, had a positive effect on the coping score. Thus, this study at least partially confirms already existing results. In a population-based study by Iddi et al. education and economic class were also significantly related with coping.

Furthermore, especially emotion-focused and problem-focused coping strategies were associated with positive moods, whereas dysfunctional coping strategies were associated with negative moods and higher levels of worry. In contrast, physical activity, following a routine and pursuing hobbies were negatively correlated with depression, anxiety and acute stress symptoms. Adaptive coping strategies such as acceptance, reframing and a sense of humour, as well as seeking emotional support showed a negative correlation to psychopathological symptoms.

Moreover, in the overall view of our results, a key function of the health department or care during the quarantine period can be inferred. Being a central contact, the health department has, on the one hand, an advisory function. By addressing possible coping strategies and providing hints to do things such as activating their social networks, citizens’ intrinsic coping strategies and resources could be activated. Recommendations regarding a healthy lifestyle such as exercising or using relaxation techniques during the quarantine period should also be addressed in the care. In addition, the office can function as a mediator. It could establish connections between those affected and external support systems, such as everyday or neighbourhood helpers who can ensure that those affected are cared for.

The vast majority, 80.6%, reported that they perceived support from family and friends as helpful. Having a daily routine (57%), praying (70%) and music (45%) were also reported as other coping strategies.

The results of the COSMO study showed a decrease in the use of coping strategies and general life satisfaction and a simultaneous increase in boredom and perceived helplessness between March 2020 and March 2021. Coping strategies that decreased over time included using the telephone or social media, making plans for daily life and implementing new activities to facilitate staying at home. Furthermore, both offering and receiving support diminished. In the same period, the self-reported perception of stress increased from 51.8% to 56.3%.

In our study, a higher coping score was associated with female gender, higher age, the quarantine reason ‘tested positive’, a higher SES and resilience score as well as lower psychological distress during stay-at-home order. In addition, a healthy lifestyle, that is, a healthy diet or physical activity during quarantine, had a positive effect on the coping score. Thus, this study at least partially confirms already existing results. In a population-based study by Iddi et al. education and economic class were also significantly related with coping.

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A clear strength of the present study is its large sample size, which includes a systematically recorded set of Cologne citizens under legally enforced quarantine. Through the possibility of free-text answers, this study also included qualitative questions and thus enabled a detailed insight into the respondents’ way of thinking. However, due to the subsequent anonymisation of the inputs, no analysis of the effects of individual coping strategies on the coping score and thus possibly on psychological distress is possible. Thus, this is a purely explorative and descriptive recording of applied mechanisms, which can form the basis for further studies and provides many suggestions for the accompaniment and care of quarantined people.

In addition, the questionnaire was based on the COSMO study so that the results could also be compared with its data. Therefore, items of established questionnaires such as the GAD-7, ADS and IES-R were combined. None of these classic questionnaires was used in their complete psychometrically evaluated form, and the COPE inventory was not used either. A largely stable Cronbach’s alpha was found, indicating the internal reliability of our study. External validity, on the other hand, is not verifiable. The reason for this is firstly the complete anonymity of the study, which does not allow a comparison between responders and non-responders, and secondly, the lack of a matched unquarantined control group. Another limitation arises from the fact that the questionnaire was answered mainly by people with a high level of education. Citizens with a migration background are also underrepresented despite translated questionnaires. Furthermore, it should be noted that the participants sometimes answered the questionnaire months after the actual quarantine period. This could have influenced and distorted the answers and assessments given. The influence of the time of the quarantine, the concrete regulations, and the currently prevailing state of knowledge about the coronavirus were also omitted. Causal inferences are only possible to a limited extent due to the cross-sectional design.

**Conclusion**

In summary, IPs experienced a significantly higher psychological burden than CPs and benefited, above all, from the social environment and from close care during their legally enforced quarantine. In contrast to CPs, IPs more often felt powerless in the face of their situation. Conversely, CPs more often reported making plans for everyday life and finding new activities during their quarantine period.

In addition to providing support and counselling to quarantined people on how to cope with the disease and this crisis, health offices could also act as an interface between those affected and external support systems such as general practitioners and/or psychiatrists. This would give them a key role in combating the pandemic and reducing possible long-term psychological consequences.

**Strengths and limitations**

A clear strength of the present study is its large sample size, which includes a systematically recorded set of Cologne citizens under legally enforced quarantine. Through the possibility of free-text answers, this study also included qualitative questions and thus enabled a detailed insight into the respondents' way of thinking. However, due to the subsequent anonymisation of the inputs, no analysis of the effects of individual coping strategies on the coping score and thus possibly on psychological distress is possible. Thus, this is a purely explorative and descriptive recording of applied mechanisms, which can form the basis for further studies and provides many suggestions for the accompaniment and care of quarantined people.

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**Table 5**

Baseline and final model explaining 25.9% of the variance of the coping score.

| Models          | Independent variables                        | Standardised regression coefficient β (standard error) | P value |
|-----------------|---------------------------------------------|-------------------------------------------------------|---------|
| Baseline model  | Quarantine as IP vs CP                      | –0.22 [.022]                                          | .040    |
|                 | Age (in years)                              | 0.184 [.001]                                          | <.001   |
|                 | Sex female vs male                          | –0.166 [.022]                                         | <.001   |
|                 | Migration background no vs yes              | –0.005 [.047]                                         | .292 n.s.|
|                 | SES medium or low vs high                   | 0.043 [.027]                                          | <.001   |
|                 | Chronic diseases yes vs no                  | 0.000 [.025]                                          | .984 n.s.|
|                 | Living situation with balcony and/or garden vs no access to outdoors | –0.202 [.030]                                      | .072 n.s.|
|                 | Living with a partner yes vs no             | 0.011 [.024]                                          | .353 n.s.|
|                 | Living with child(ren) yes vs no            | –0.007 [.026]                                         | .611 n.s.|
|                 | Brief resilience scale score                | 0.138 [.015]                                          | <.001   |
|                 | Psychological distress score                | –0.281 [.017]                                         | <.001   |
|                 | Healthy Eating Index (unhealthier vs healthier or no change) | 0.122 [.023]                                      | <.001   |
|                 | Physical activity during quarantine yes vs no | –0.167 [.023]                                       | <.001   |
| Final model     | Quarantine as IP vs CP                      | –0.22 [.022]                                          | .046    |
|                 | Age (in years)                              | 0.186 [.001]                                          | <.001   |
|                 | Sex female vs male                          | –0.107 [.022]                                         | <.001   |
|                 | SES medium or low vs high                   | 0.042 [.027]                                          | <.001   |
|                 | Living situation with balcony and/or garden vs no access to outdoors | –0.202 [.029]                                      | .070 n.s.|
|                 | Brief resilience scale score                | 0.138 [.015]                                          | <.001   |
|                 | Psychological distress score                | –0.280 [.017]                                         | <.001   |
|                 | Healthy Eating Index (unhealthier vs healthier or no change) | 0.122 [.023]                                      | <.001   |
|                 | Physical activity during quarantine yes vs no | –0.167 [.023]                                       | <.001   |

* Linear regression; significance level set at ≤.05.

**Competing interests**

The authors declare that they have no competing interests.

**Consent for publication**

Not applicable.

**Availability of data and materials**

The data sets used and/or analysed in the present study are not publicly available due to the inclusion of sensitive personal data.
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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.tjhpue.2022.05.022.

Author's contributions

C.J., B.G., S.F., L.K., A.F., A.K., J.N. and G.W. conducted the study. Data collection was done by L.K., A.F., N.E. and C.G. L.K. and C.J. analysed the data. L.K. and C.J. wrote the manuscript. All authors critically revised the final version of the manuscript.

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