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Posted Date: 16 November 2023

doi: 10.20944/preprints202311.1065.v1

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Article

The Effect of Nudging on Compliance with Individual Prevention Measures against COVID-19: An Online Experiment on Greek University Students

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Abstract: Nudging has often been suggested as a means to promote health care efficiency and effectiveness by influencing behavior without restricting choice; its usefulness however has not been adequately assessed. We examined the effect of an altruistically framed awareness message about the novel coronavirus on the intention to comply with individual prevention measures against infection. 425 Greek postgraduate students, that were randomly assigned into a treatment and a control group, filled out a questionnaire on compliance and future intention to comply with six preventive measures. Results indicate that the altruistic message did not manage to influence intention to comply. Moreover, compliance was positively associated with risk perception, whereas women showed both higher compliance and risk perception than men. Vulnerability to novel coronavirus and positive vaccination status against it were accompanied by greater perception of risk, while the personal history of COVID-19 was associated with lower intention to comply, lower risk perception and higher health risk preferences. We conclude that nudging interventions should be evaluated before being adopted in practice, taking into account timing, target groups and means of communication.

Keywords: COVID-19; nudge; framing; preventive behavior; behavioral economics

1. Introduction

This paper aims to study the role of altruistic framing of messages in dealing with the COVID-19 pandemic. Framing constitutes a tool of behavioral economics, a field that may have useful applications in influencing health-related behaviors, such as addictions, exercise, diet, medication compliance and disease prevention, thus assisting governmental policies that focus on modifying individual behavior for the common good [1]. In essence, framing is a “nudge”, that is “any aspect of the choice architecture that alters people’s behavior in a predictable way without forbidding any options or significantly changing their economic incentives” [2] (p. 6).

Given the severity of the recent SARS-CoV-2 pandemic, and the importance of compliance with individual prevention measures [3], the present work is an attempt of behavioral management of an epidemic infectious disease with potential health policy implications. Our main focus is whether the altruistic framing can increase the adoption of precautionary measures against the transmission of coronavirus (use of masks, frequent handwashing, avoidance of overcrowding, touching face and handshakes, adoption of contactless transactions). Other research objectives involve the measurement of general and health risk attitudes, COVID-19 risk perception, prosociality and the beliefs about the effectiveness of the aforementioned measures (personal efficacy).

The previous experience of Eastern countries with SARS contributed significantly to their success in limiting the pandemic spread, as they immediately adapted to increased personal hygiene, masks and social distancing [4]. Such practices not only protect the user, but also society in general via positive externalities. Therefore, according to Jordan et al. [5], they could be seen either as self-centered or prosocial, and the motivations behind them as individualistic or altruistic. Following the classical economic theory, according to which individuals make decisions that maximize their utility, one would expect the personal interest to be a stronger motivator than the collective one. However, there is empirical evidence that altruism has great motivational power, and depending on the environment, interaction between altruists and self-centered people can lead to cooperation between them [6].

Turning to the field of health-related behaviors, it has been shown that both types of motivation, individualistic and altruistic, can encourage vaccination decisions [7–9]. However, comparing the relative effectiveness between the two types of framing has led to divergent results in different settings. For example, the findings of Isler et al. [10] are indicative of the superiority of the individualistic frame in reinforcing influenza vaccination intentions on high risk patients. On the contrary, in a study of young men's attitudes towards the human papilloma virus (HPV) vaccine, Bonafide and Venable [11] found that the simultaneous emphasis on both social and personal benefit was accompanied by greater acceptance of the vaccine. Also, in an experiment by Grant and Hofmann [12], healthcare professionals significantly increased their hand hygiene when they were exposed to a message reminding them of the patients' benefits, compared to the one emphasizing personal benefits. It follows that the existing literature does not clarify which of the two types of framing is more effective in preventing the transmission of infectious diseases. However, keeping in mind that the young are generally less severely affected by SARS-CoV-2 than the elderly [13], it could be assumed that the individualistic frame is not going to promote compliance with prevention measures on those who are not afraid of getting infected. Utych and Fowler [14], by using a message which emphasized the risk of both young and old people from COVID-19, managed to increase only the risk perception of residents in areas with high rates of infection, but not the intentions to comply. For this reason, the use of a special altruistic frame, focusing on family members' risk, may direct young people's attention to the benefit of their loved ones at least.

Risk perception, in fact, is a subjective psychological structure, which is influenced by a number of factors, such as cognitive, emotional, social and cultural, so it can differ not only between individuals but also between different societies [15,16]. Thus, Dryhurst et al. [17], following a holistic approach and collecting data from a total of ten countries in Europe, America and Asia, showed that COVID-19 risk perception is strongly correlated with the self-reported degree of adoption of preventive measures in all countries, without exception.

Based on the above, the following research hypotheses are formulated:

Hypothesis 1. *Exposure to an altruistic nudging message has a positive effect on compliance behavior of individuals.*

Hypothesis 2. *Compliance is associated with risk perception.*

In an online experiment conducted in Japan by Sasaki et al. [18], five different nudge-based messages were used and their effects on both the intention to adopt preventive behaviors and the actual change in behavior were measured initially and at a later follow-up. The "altruistic message" that focused on protecting people belonging to the close-family circle was the one that reinforced both the behavioral intention and the actual change in behavior. In fact, this positive action disappeared when this message was presented in a context that emphasized loss, or when it emphasized the protection of both the participants themselves and of other people. The message, which focused only on the personal benefit, had the unexpected effect of reducing both intention and actual compliance.

Similarly, Jordan et al. [5], studying the framing of three different messages with a focus on personal, social, and simultaneously personal and social benefit, respectively, initially demonstrated

the superiority of the intervention focusing on social benefit, but at follow-up found that all three interventions were equally effective in terms of intention to comply with prevention measures. Falco and Zaccagni [19] found that framing, with an emphasis on the effects of non-compliance on the subjects themselves and their families, reinforced intentions to stay at home, as opposed to framing that emphasized the consequences on fellow citizens or the country as a whole, but these reinforced intentions were not accompanied by a statistically significant difference in subsequent actual behavior.

Last but not least, it is no coincidence that people with developed prosociality are more likely to keep social distance, stay home when they are sick, and buy masks [20]. However, there are still conflicting findings, such as those of Favero and Pedersen [21], who failed to detect a significant effect from the application of prosocial motivation on how long the subjects of their study intended to maintain social distance.

2. Materials and Methods

The study was approved by the Health Care Management (DMY) Programme of Study Committee, acting as a Committee for Research Ethics of the University. The research design has the form of an online experiment, in which postgraduate students of the School of Social Sciences of the Hellenic Open University (H.O.U.) were invited to participate upon notification via email to their electronic academic account. The emails with the link of the questionnaire were sent en masse by the secretariat of the School in question, while the members of the research team did not have access to the students' emails.

Students, constituting the population under study, are generally a young population group, with a relatively lower risk of getting a serious COVID-19 infection compared to the elderly [13], a fact which could affect their degree of compliance with prevention measures [22]. As a matter of fact, an analysis of mobility trends has shown that individuals aged between 20 to 49 years old were responsible for sustaining the resurgence of the epidemic wave from the middle of 2020 in the USA, after the initial decrease in the number of cases [23].

The sampling method is of the convenience type and therefore the present sample is not nationally representative. The free online questionnaire design platform "Google Forms" was used and the sample was randomly divided into two groups depending on the month of birth (odd/even). Participants who stated an odd month made up the control group and were not exposed to any kind of message. On the contrary, those who stated an even month made up the treatment group and were exposed to an altruistically framed message, which consisted of a poster and an accompanying text. All the other questions were common for both groups. It should also be noted that the ability of "Google Forms" to record participants' emails had been disabled, and participants had to give their consent in order to fill in the questionnaire anonymously, without receiving any kind of compensation.

As it is impossible to calculate the precise number of people invited, it is estimated that around 800 students received the email. The response collection period lasted 2 weeks (15 – 31 January 2022), during which a total of 425 responses were collected ($N = 425$). At that time, several personal protection measures were already in place, such as the mandatory use of masks both indoors and outdoors, maintaining distances, etc [24]. Also, from mid-December 2021 to the end of the data collection, there was a surge in COVID-19 cases averaging 30,000 per day, with around 100 deaths per day [25].

The questionnaire was based on the research of Jordan et al. [5], Sasaki et al. [18], Dryhurst et al. [17] and Dohmen et al [26].

Initial questions involved demographics and health information.

Compliance during the previous week with each of six measures ("use of mask", "frequent hand washing", "avoidance of overcrowding", "avoidance of touching face", "adoption of contactless transactions", "avoidance of handshakes") was measured through 11-point Likert scales from 0 to 10. A cumulative scale of the above six items from 0 to 60 was created, constituting the "Compliance" index.

In the next section, general and health risk attitudes were measured with two questions through an 11-point Likert scale from 0 to 10, following the conclusion of Dohmen et al. [26] that a general risk question can be a useful and valid tool for exploring risk preferences, especially when framed in a specific context.

To measure COVID-19 risk perception, 5 questions were used, based on 7-point Likert scales from 1 to 7. The “Risk perception” index is a cumulative scale of the five measurements with a span from 5 to 35 [17,27].

The intervention of the experiment involved a poster and an accompanying text about the coronavirus, with a question regarding the persuasiveness of the poster on a 7-point Likert scale from 1 to 7, following immediately afterwards (See Figure 1).



Figure 1. Altruistic message poster.

Altruistic message text: “The Covid-19 virus continues to affect the global population. Recently, a new pandemic wave is taking place, making it clear that in the near future the health of your loved ones is under serious threat. It is recommended to follow directions regarding individual protection measures to prevent transmission and any serious illness or even death of your friends and relatives”.

Shortly afterwards, participants had to answer six questions about their intention to implement the same individual COVID-19 prevention measures in the near future. The wording of the questions was slightly modified to emphasize that this time it was a measure of the intention to implement the respective measures. A cumulative scale of six items from 0 to 60 was created, constituting the “Intention” index.

Finally, an attempt was made to fundamentally measure prosociality with a single question, through a 7-point Likert scale from 1 to 7, and similarly to measure personal efficacy, following Dryhurst et al [17]. For more details about the questionnaire, see the Appendix A.

All factor scores were converted to a 0-100 scale using the formula: $100 \cdot (X_i - \text{Min}(X)) / \text{Range}(X)$.

3. Results

In addition to the descriptive study, the statistical data analysis is focused mainly on statistical hypothesis testing and correlation analysis. After testing for normality with the Shapiro-Wilk test, it turned out that our data do not follow the normal distribution. Therefore, non-parametric tests (Mann-Whitney & Wilcoxon) were applied at a significance level of $\alpha = 0.05$. Furthermore, in order to examine the relevance between qualitative variables, χ^2 (chi-square) independence tests were performed, while Cronbach’s alpha was calculated to assess internal consistency reliability.

The sample size is $N = 425$ ($N_{\text{control group}} = 208$, $N_{\text{treatment group}} = 217$), with a median age of 40 years (24 – 59 years), and consists of 102 male (24%) and 323 female (76%) students. Descriptive statistics of the qualitative medical profile variables are shown in Table 1, whereas means and confidence intervals of the quantitative variables in Table 2.

Table 1. Participant's medical profile (N=425).

Nominal variables	Category	f	%
Personal history of COVID-19	Positive	121	28.5
	Negative	304	71.5
Family history of COVID-19	Positive	219	51.5
	Negative	206	48.5
Vulnerability to novel coronavirus	Yes	45	10.6
	No	372	87.5
	I don't know	8	1.9
Self-assessment of health status	Very bad	1	0.2
	Bad	2	0.5
	Moderate	18	4.2
	Good	96	22.6
	Very good	193	45.4
COVID-19 vaccination status	Excellent	115	27.1
	Vaccinated	408	96.0
	Non-vaccinated	17	4.0

Table 2. Means, standard deviations and confidence intervals for items and scales (N=425).

Item/Scale	Mean	S.D.	95% CI lower	95% CI upper
Use of mask*	94.24	11.85	93.11	95.37
Frequent handwashing*	93.32	11.60	92.21	94.42
Avoidance of overcrowding*	87.41	18.89	85.61	89.21
Avoidance of touching face mucosa*	82.82	20.83	80.84	84.81
Adoption of contactless transactions*	84.52	19.81	82.63	86.41
Avoidance of handshakes*	88.38	17.39	86.72	90.03
Worry about the pandemic	59.57	25.72	57.12	62.02
Personal chance of infection	72.08	24.14	69.78	74.38
Familial chance of infection	77.61	20.31	75.67	79.54
Assessment of virus spread	89.76	14.22	88.41	91.12
Understanding disease severity	90.24	15.42	88.76	91.71
Compliance**	88.45	10.87	87.41	89.48
Risk perception**	77.85	13.32	76.58	79.12
Intention**	90.44	11.08	89.39	91.45
General risk attitudes	54.35	26.70	51.80	56.90
Health risk attitudes	30.99	28.43	28.28	33.70
Prosociality	82.16	17.84	80.46	83.86
Personal efficacy	87.73	16.08	86.19	89.26

Note: * denotes recent compliance with each preventive measure (the items regarding intentions to comply with each measure separately are not shown). ** Bold letters denote scales rather than individual questionnaire items.

Cronbach's alpha is 0.703 for the six-item scale of "Compliance", 0.802 for the corresponding scale of "Intention", and 0.659 for the five-item scale of "Risk Perception".

The change in compliance behavior of participants in each group (intervention, control) was defined as the difference between the scales "intention to comply in the near future" and "compliance in the previous week", which consist of the six precautionary measures (items). Wilcoxon's non-parametric test showed that there was a statistically significant difference between the intention to comply in the near future and compliance in the previous week, for both the treatment ($p < 0.001$) and the control ($p < 0.001$) group.

Next, the potential effect of the altruistic message (nudge) on participant's behavior was assessed by the difference (if any) of the magnitudes of the changes in compliance behavior mentioned above

in the intervention and control groups. In fact, as shown in Table 3, a Mann – Whitney non-parametric test showed that there was no statistically significant difference between the changes in compliance behavior in the two groups, i.e. the group exposed to nudging via the “altruistic message” and the control group.

Therefore, **Hypothesis 1**, that exposure to an altruistic nudging message has a positive effect on compliance behavior of individuals, is not supported by our analysis.

Table 3. Recent compliance and intention to comply with prevention measures in the near future in the treatment and control groups.

Variable	Control group	Treatment group	Z*	p-value
Compliance (A)	88.74	88.16	-0.348	0.728
Intention (B)	90.52	90.37	-0.284	0.776
Difference (B) – (A)	1.78	2.20	-0.022	0.982

* Mann-Whitney test.

It should be noted that Mann-Whitney tests showed that the two groups did not significantly differ in terms of age ($p = 0.104$), compliance ($p = 0.728$), risk perception ($p = 0.186$), general risk attitudes ($p = 0.503$), health risk attitudes ($p = 0.896$), prosociality ($p = 0.130$) and personal efficacy ($p = 0.166$).

In addition, χ^2 independence tests indicated that the partition method (month of birth: odd/even), was independent of gender ($p = 0.248$), personal history of COVID-19 ($p = 0.702$), family history of COVID-19 ($p = 0.874$), vulnerability to novel coronavirus ($p = 0.346$) and self-referred health status ($p = 0.718$).

Subsequently, the compliance, intention, risk perception, general risk attitudes, health risk attitudes, prosociality, and personal efficacy variables were compared between subgroups based on sex, personal history of COVID-19, vulnerability to novel coronavirus and corresponding vaccination status.

Mann-Whitney tests showed that female students showed higher compliance ($p = 0.001$), intention ($p = 0.001$) and risk perception ($p = 0.001$) than male students, whereas general risk attitudes ($p = 0.678$), health risk attitudes ($p = 0.927$), prosociality ($p = 0.433$) and personal efficacy ($p = 0.101$) did not differ between males and females.

Between students with a personal history of COVID-19 and those without, Mann-Whitney tests showed that the former had lower intention ($p = 0.026$) and risk perception ($p = 0.007$) and higher health risk attitudes ($p = 0.019$) (that is, higher risk-taking attitudes regarding health). Compliance ($p = 0.153$), general risk attitudes ($p = 0.379$), prosociality ($p = 0.718$) and personal efficacy ($p = 0.132$) did not differ significantly between these two subgroups.

Regarding vulnerability to novel coronavirus, Mann-Whitney tests showed that only risk perception ($p = 0.003$) varied significantly between vulnerable and non-vulnerable students, with the former having greater perception of risk from the disease. Compliance ($p = 0.540$), intention ($p = 0.248$), general risk attitudes ($p = 0.403$), health risk attitudes ($p = 0.470$), prosociality ($p = 0.308$) and personal efficacy ($p = 0.073$) did not essentially differ.

As for the vaccination status against COVID-19, Mann-Whitney tests showed that the vaccinated students showed higher risk perception ($p = 0.008$) and personal efficacy ($p = 0.040$) than the non-vaccinated ones. Compliance ($p = 0.292$), intention ($p = 0.895$), general risk attitudes ($p = 0.174$), health risk attitudes ($p = 0.710$) and prosociality ($p = 0.158$) did not vary substantially.

Furthermore, computed correlations showed that compliance was positively associated with risk perception (Spearman's $\rho(425) = 0.136$, $p = 0.005$), intention (Spearman's $\rho(425) = 0.788$, $p < 0.001$), prosociality (Spearman's $\rho(425) = 0.200$, $p < 0.001$), personal efficacy (Spearman's $\rho(425) = 0.334$, $p < 0.001$) and age (Spearman's $\rho(425) = 0.382$, $p < 0.001$), and negatively with general risk attitudes (Spearman's $\rho(425) = -0.135$, $p = 0.005$) and health risk attitudes (Spearman's $\rho(425) = -0.263$, $p < 0.001$).

Therefore, **Hypothesis 2**, that compliance is associated with risk perception, is supported by our analysis.

4. Discussion

In this section, the results of our empirical study are discussed in the context of the broader literature on behavioral management of compliance with preventive measures against the novel coronavirus, with a view that policymakers might be helped in updating their communication strategies. The COVID-19 pandemic is an important field of application of Behavioral Economics, as its tools could potentially motivate individuals to protect themselves from infection and therefore halt the spread of the virus [28]. The nudge studied in this research concerns the altruistic framing of an awareness message about the current pandemic and its' effect on the intention to comply with preventive measures. Many interesting conclusions can be drawn.

A high rate of compliance with COVID-19 preventive measures was observed for the majority of the respondents. It seems that the mobilization of the media and the authorities led to a greater realization of the need to follow the instructions for self-protection, as was also seen in a survey conducted in Germany and Switzerland [29]. Furthermore, in accordance with Dryhurst et al. [17], the measurement of COVID-19 *risk perception* and *prosociality* showed high values as well, and the two variables were positively correlated with compliance, but to a weak extent in our case. In fact, Kanellopoulou et al. [30] attributed the great willingness to implement preventive measures against COVID-19 by Greek citizens to the high degree of risk perception. As for the factor of prosociality, several researchers agree that the degree of pro-social behavior displayed by individuals acts beneficially on compliance and intention to comply with prevention measures, helping in this way to decelerate the spread of the virus [20,31].

Regarding the effect of the altruistic message, the difference "intention to comply with preventive measures against COVID-19 minus previous compliance" did not vary significantly between the treatment and control group. It follows that nudging via an altruistic message had no effect on behavior. These results contradict the finding of increased intentions through prosocial incentives by Sasaki et al. [18], and agree with those of Jordan et al. [5], who found no reinforcing action of altruistic framing at follow-up, despite the initial encouraging results. Presumably, motivational messages cannot bring any additional benefit, due to the fact that the majority of participants already appear quite compliant with the measures [32]. In addition, Favero and Pedersen [21] reported that messages highlighting the value of social distancing in reducing the spread of the novel coronavirus are expected to have better results in the early stages of the pandemic. As we go through the second year of this complex crisis, it is natural to observe phenomena of saturation by messages in a significant part of the Greek society, making their further promotion ineffective.

The effect of demographic characteristics and medical profile of the respondents on particular variables, was also examined. To begin with, those who have been sick with COVID-19 or have had a positive diagnostic test showed a lower risk perception of the disease and a lower intention to comply with preventive measures, while generally appear to take more health-related risks than those who have not been infected yet. A UK health system survey [33], underlines that due to the high prevalence of asymptomatic disease among citizens, those who were ill but not hospitalized showed a lower risk perception of the disease. These findings, along with ours, are not in line with the research findings of Dryhurst et al. [17], which probably referred to a more lethal variant of the virus and a period when vaccines were not readily available to the public.

Furthermore, the participants who are vulnerable to the novel coronavirus showed greater risk perception, a fact that is not accompanied though by a higher intention to implement individual prevention measures. According to Ramkissoon [34], people who belong to vulnerable groups are already compliant with preventive measures against infections, and thus can follow more easily the suggested behaviors, as instructed by the specialists.

Finally, it is worth mentioning that the vaccinated students showed a greater perception of the risk of infection and of the effectiveness of individual measures to avoid it (personal efficacy). According to Wright et al. [35], individuals who got vaccinated against COVID-19, do not show less compliance with protective measures, and this fact indicates their high perception of risk from the virus.

5. Conclusions

At the specific stage of the pandemic in which the study was conducted, the altruistic framing did not seem capable of further raising the intention to adopt preventive behaviours against COVID-19. Apparently, the altruistic message was in a sense subjected to an endurance test, as it was implemented during the second year of the pandemic in Greece. So, apart from possible ceiling effects, it is also reasonable to expect fatigue phenomena in society, after so many months of following the measures, but at the same time it is crucial to avoid a sharp relaxation of their implementation. Nese et al. [36] warns that the longer the duration of the imposed restrictive measures, the greater the relaxation in the proper maintenance of preventive behaviours. Fortunately, in our case, a particularly high degree of compliance with preventive measures was observed, and the referred intentions by the two groups were equally higher than their previous compliance measurements. However, in absolute terms, the observed difference between intention and compliance in both groups does not seem to be a significant improvement, and apart from that, we should not forget the existence of the so-called “intention-behavior gap”, which means that the referred intention is not always followed by the corresponding actual behavior [37].

It is also noted that compliance was positively correlated with risk perception, prosociality, intention and personal efficacy and negatively correlated with general and health risk attitudes. In this aspect, female students showed higher compliance, intention and risk perception, while they appeared to share the same general and health risk attitudes, prosociality and personal efficacy with male students. Furthermore, the vulnerable students to novel coronavirus and those who were vaccinated against COVID-19 were characterized by greater risk perception, while students with a personal history of COVID-19 prefer to take more health risks and had a lower risk perception and intention to comply with preventive measures.

The age criterion played an important role in the selection of students as a sample of the present study, since younger individuals have a lower risk of severe infection from novel coronavirus compared to older ones, a fact which may affect their compliance with the suggested preventive measures [13,22]. Thus, any intervention aimed at raising awareness among young people regarding the pandemic, is expected to bring significant benefits for public health. However, as it is doubtful whether the results of our study can be generalized due to the convenience sampling method, it would be advisable to use stratified nation-wide samples in future studies, in order to reach nationally representative conclusions about the behavior of the young.

To sum up, a nudge based on altruistic framing is an interesting intervention that could well be tested so as to find whether it can be included in the set of tools to fight the current and future pandemics. Target population groups for future behavioural experiments, in addition to young people, are the elderly and minority groups, who are hit more severely by the novel coronavirus [38]. Also, vaccination against COVID-19, especially of vulnerable groups, is expected to be a critical area for testing various types of nudges. To guarantee the effectiveness of nudge-type interventions, it is advisable to pursue a pilot testing at first so as to determine the specific population groups on which they are likely to have the greatest effect. In other words, we suggest that behavioural interventions be targeted rather than horizontal. Another consideration would be the need to use more expressive means of communication when nudging, beyond the usual simple text messages. In any case, research on nudge interventions is expected to enrich our knowledge around this rapidly evolving field and to inform political actors about their possible applications in the public health agenda.

Author Contributions: Conceptualization, I.E. and V.A.; methodology, I.E.; validation, D.N. and V.A.; formal analysis, I.E. and M.D.; investigation, M.D.; resources, D.N. and V.A.; data curation, I.E.; writing—original draft preparation, I.E. and M.D.; writing—review and editing, D.N. and V.A.; visualization, I.E. and M.D.; supervision, D.N. and V.A.; project administration, D.N. and V.A.; All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Acknowledgments: None.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Questionnaire

- What is your age?
– Numeric value
- What is your sex?
– Female / Male
- Have you had COVID-19 or tested positive for COVID-19?
– Yes / No
- Has any member of your family been sick with COVID-19 or tested positive for COVID-19?
– Yes / No
- Do you belong to any of the vulnerable groups to COVID-19?
– Yes / No / I don't know
- How would you characterize your health status based on any diagnosed underlying diseases?
– 7-point Likert scale: 1 = terrible, 2 = very bad, 3 = bad, 4 = moderate, 5 = good, 6 = very good, 7 = excellent
- Have you been vaccinated against COVID-19?
– Yes / No

Please indicate the extent to which you agree or disagree with the following statements regarding the extent to which you implemented preventive measures against COVID-19 DURING THE PREVIOUS WEEK, on a scale from 0 to 10, where 0 means "strongly disagree", 5 means "neither agree nor disagree" and 10 means "strongly agree":

- Did you wear a mask properly, with your nose and mouth covered, indoors where required (e.g. in the supermarket, at work)?
 - Did you wash your hands often and carefully / or did you apply antiseptic after touching potentially contaminated surfaces whenever possible (e.g. when returning home, at work)?
 - Did you avoid crowded indoor spaces or places that require close contact between people?
 - Did you avoid touching your eyes, nose and mouth, without washing your hands first?
 - Did you prefer contactless payment methods (e.g. credit cards, mobile phone) over cash for your purchases?
 - Did you avoid kisses, handshakes and hugs?
 - Do you consider yourself a person who is willing to take risks? Please answer on a scale from 0 to 10, where 0 means "completely unwilling to take risks in general", and 10 means "completely willing to take risks in general".
 - Do you consider yourself a person who is willing to take risks related to health? Please answer on a scale from 0 to 10, where 0 means "completely unwilling to take risks related to my health", and 10 means "completely willing to take risks related to my health".
 - How worried are you about COVID-19?
– 7-point Likert scale: 1 = Not worried at all – 7 = Extremely worried
 - How likely do you think it is that you will get COVID-19 in the next six months?
– 7-point Likert scale: 1 = Not at all likely – 7 = Extremely likely
 - How likely do you think it is that your friends or relatives will be affected by COVID-19 in next six months?
– 7-point Likert scale: 1 = Not at all likely – 7 = Extremely likely
 - How much do you agree with the following statement: "COVID-19 will affect a large part of the population in our country"?
– 7-point Likert scale: 1 = I strongly disagree – 7 = I strongly agree
 - How much do you agree with the following statement: "COVID-19 can be serious"?
– 7-point Likert scale: 1 = I strongly disagree – 7 = I strongly agree

PARTITION

- What month of the year were you born?
– Odd (January, March, May, July, September, November) = Control group

– Even (February, April, June, August, October, December) = Treatment group

INTERVENTION: Altruistic poster and message were presented only to the treatment group – (see publication text).

- In your opinion, how effective – persuasive do you think the poster you just saw is?
- 7-point Likert scale: 1 = Not persuasive at all – 7 = Extremely persuasive (answered only by the treatment group)

Despite the possible similarity of the following questions and since there are no right or wrong answers, please answer again honestly. Mark the degree of agreement or disagreement with the following questions, which now concern your intention to implement preventive measures against the COVID-19 IN THE NEAR FUTURE, on a scale from 0 to 10, where 0 means "strongly disagree", 5 means "neither agree nor disagree", and 10 means "strongly agree".

- Do you intend to avoid crowded indoor spaces or places that require close contact between people?
- Do you intend to prefer contactless payment methods (e.g. credit cards, mobile phone) over cash for your purchases?
- Do you intend to wear a mask properly, with your nose and mouth covered, indoors where required (e.g. in the supermarket, at work)?
- Do you intend to avoid kisses, handshakes and hugs?
- Do you intend to wash your hands often and carefully / or to apply antiseptic after touching potentially contaminated surfaces whenever possible (e.g. when returning home, at work)?
- Do you intend to avoid touching your eyes, nose and mouth, without washing your hands first?
- How important is it to you to act for the benefit of others and society as a whole, even if it may sometimes cost you (financially or otherwise)?
- 7-point Likert scale: 1 = Not important at all – 7 = Extremely important
- To what extent do you feel that the individual preventive measures you are taking against COVID-19 really contribute to limiting the spread of the new coronavirus?
- 7-point Likert scale: 1 = They do not contribute at all – 7 = They contribute a lot

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