Title: Public perceptions and behavioural responses to the first COVID-19 pandemic wave in Italy: Results from the iCARE study

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Abstract

**Background:** Italy was the first European country to be affected by COVID-19. Considering that many countries are currently battling the 2\textsuperscript{nd} wave of the pandemic, understanding people’s perceptions and responses to government policies remains critical for informing on-going mitigation strategies. We assessed attitudes towards COVID-19 policies, levels of adherence to preventive behaviours, and the association between COVID-19 related concerns and adherence levels.

**Methods:** We recruited a convenience sample of Italian individuals from an international cross-sectional survey ([www.icarestudy.com](http://www.icarestudy.com)) from March 27th to May 5th 2020. Multivariate regression models were used to test the association between concerns and the adoption of preventive measures.

**Results:** The survey included 1,332 participants (female (68%), younger than 25 (57%)) that reported high awareness (over 96%) and perceived importance (88%) of policies. We observed varied levels of adherence to: hand washing (96%), avoiding social gatherings (96%), self-isolation if suspected or COVID-19 positive (77%). Significantly lower adherence to self-isolation was reported by individuals with current employment. High levels of concerns regarding health of other individuals and country economy were reported. Only health concerns for others were significantly associated with higher adherence to hand washing behaviour.

**Conclusions:**

In order to inform current/future government strategies, we provide insights about population’s responses to the initial pandemic phase in Italy. Communication approaches should consider addressing people’s concerns regarding the health of other individuals to motivate adherence to prevention measures. Provision of social and economic support is warranted to avoid unequal impacts of governmental policies and allow effective adherence to self-isolating measures.
Keywords: COVID-19, preventive behaviours, population concerns; cross-sectional study

Introduction

Coronavirus disease 2019 (COVID-19), first identified at the end of 2019 in Wuhan, China, has rapidly spread worldwide, causing an international public health emergency. On March 11 2020, the World Health Organization (WHO) declared a pandemic caused by COVID-19 (1). Despite recent vaccine developments and international rollouts, human behaviours continue to be the target of government COVID-19 prevention policy measures. During different pandemic waves, governmental actions with different levels of restrictions have been adopted worldwide, based on the epidemiological context, economic pressures, and political situation, inevitably influencing individuals and communities on multiple levels (2). Improving health systems’ preparedness and optimizing policy responses remain a priority in the context of the current pandemic. Shaping the policies and adapting them to suit different subgroups of the population has to be based on behaviour change principles and a comprehensive understanding of what the populations’ behaviours are and what influences them (3–5).

Insights from behavioural sciences show that factors influencing population adherence to COVID-19 policies can be mapped by two interconnected behaviour prediction models: 1) The Capability, Opportunity, Motivation-Behaviour (COM-B) Model, which predicts that behaviour change depends on the following: awareness of prevention measures (capability), individuals’ belief that measures are personally relevant and important (motivation) and having social and environmental structures in place to allow adoption of required behaviour (opportunity); 2) The Health Beliefs Model, which foresees that adoption of preventive behaviours is predicted by
individuals’ belief in the personal threat(s) posed by the disease as well as belief around how important and effective the recommended behaviours are (6,7).

In Europe, Italy was the first country to be affected by COVID-19, with the first confirmed case on January 31. The organization and implementation of Italian healthcare is mainly a regional jurisdiction. While the country was facing challenges to coordinate the COVID-19 response, initial policies were mainly focused on northern regions of the country, with a particularly severe outbreak (8,9). Lockdown and restriction measures were then extended to the entire nation on March 9 and March 11, respectively. Until May 5, the policy measures covered the following restrictions: only essential activities were permitted; the mobility of individuals was allowed only for reasons of work or health; schools and universities were closed; and any public gatherings were forbidden (8,10). Up to that point, the country had registered 213,013 total cases and 29,315 total deaths due to COVID-19.

In order to inform future policies and enable adequate government preparation for the ongoing and forthcoming waves of COVID-19 in Italy, it is necessary to understand population’s behavioural responses to the lockdown measures of the country during the initial stages of the pandemic. The present cross-sectional study aimed to understand people’s perceptions and attitudes towards COVID-19 policies, adherence to preventive behaviours and COVID-19 related concerns during the initial phase of the COVID-19 pandemic in Italy.

**Methods**

**Study design and participant recruitment**

The present research analyzes the Italian sample of the International assessment of COVID-19-related Attitudes, concerns Responses and impacts in relation to public health policies (iCARE) Study. Details and methodological background of the iCARE study have been published
elsewhere (11). Briefly, the iCARE study is an international multi-wave cross-sectional study capturing public awareness, attitudes as well as responses to public health measures implemented to contain COVID-19 spread (www.icarestudy.com).

Our analyses focus on the first survey of the iCARE study, which was available in multiple languages from March 27 to May 5, 2020. This timeframe corresponded to the national lockdown in Italy. The data from respondents reporting residency in Italy, regardless of survey language, were included. The iCARE survey (LimeSurvey©) was administered using online snowball sampling globally by engaging study collaborators (distribution occurred via professional associations and societies, university networks, community organizations and groups, social media, and personal contacts).

Ethics approval for the iCARE study was obtained from the Comité d’éthique de recherche du CIUSSS-NIM (Centre intégré universitaire de santé et de services sociaux du Nord-de-l’île-de-Montréal), approval #: 2020-2099 / 25-03-2020. The present paper is reported in line with the The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement (Supplementary table 1) (12).

**iCARE survey**

The survey included 54 questions on socio-demographics, health and COVID-19 status, health behaviours, sources of COVID-19 information, public awareness, attitudes and adoption of the local COVID-19 public health policies, and perceived COVID-19 related concerns.
For the purposes of the present analysis, we considered the following five behaviours: hand washing; staying at least 1-2 meters away from others (physical distancing); self-isolating if having or believing to have the virus; self-quarantining if returning from a trip; avoiding all social gatherings (social distancing). Adoption of these preventive behaviours was assessed as the frequency with which an individual has adopted different preventive behaviours in the previous 7 days (possible answers: Most of the time, Some of the time, Seldom, Never). COVID-related concerns were measured with 14 different survey items, with possible answers: To a Great Extent, Somewhat, Very Little, Not at All.

The survey was designed to measure constructs related to the COM-B Model (6) and Health Belief Model (13) (more details available in the iCARE protocol study (11)). The survey is available online: https://osf.io/nswcm/.

**Statistical analysis**

Descriptive statistics (mean (M), standard deviation (SD) and proportions) were calculated to provide an overview of the study sample in terms of demographic characteristics and selected lifestyle habits. Questionnaire items that included an answer ‘I don’t know/I prefer not to answer/Not applicable’ were considered missing values. In order to assess adherence to preventive behaviours and COVID-19 related concerns, we reported proportions of individuals that reported practicing behaviours Most of the time and expressing concerns To a great extent, vs. all other response options. Stratified analysis was conducted according to a series of sociodemographic variables, including age, sex, education, current employment and living situation.

In order to classify the Italian regions with different epidemiological scenarios, we used COVID-19 cumulative incidence rates, reported by Istituto Superiore di Sanità (National Health Institute).
on April 30th, 2020 (14). Specifically, we used the values of the interquartile range (IQR) of the cumulative incidence rates to classify the regions into three different levels of transmission. Regions with rates higher than the upper limit of the IQR, within the values of IQR, and lower than the lower limit of IQR were classified as high, intermediate, and low transmission areas, respectively (Supplementary table 2) (15).

To cluster COVID-19-related concerns, we performed a principal component analysis (PCA) on polychoric correlation matrix of the 14 variables in the COVID-19 concerns module. An orthogonal (varimax) rotation was done in order to distribute the factor loadings. We identified four concern patterns in the sample that were selected based on the Kaiser criterion (eigenvalue>1.0), scree plot, and components interpretability (16). Items with factor loadings higher than 0.4 were used to interpret each component of COVID-19 concerns. We observed a four-factor structure that included: ‘Health concerns (self)’, ‘Health concerns (others)’, ‘Personal financial concerns’, ‘Social/economic concerns’ (Supplementary table 3). Individual items were averaged in order to create four components (M and SD are reported). Multivariate logistic regression models were applied to test the association between the adoption of preventive measures (dependent variables) and COVID-19 related concerns (independent variables). Additional variables included as an adjustment in the models were age, sex, education and region of COVID-19 transmission. All statistical tests were two-sided, and a p-value < 0.05 was considered statistically significant. Statistical analysis was performed in SAS, version 9.4.

**Results**

**Study population**
A total of 1,332 participants were included in our survey in the period from March 27\textsuperscript{th} to May 5\textsuperscript{th} 2020 (Table 1). Participants were predominantly younger adults (individuals younger than 25 (57%), female (68%), and without existing health problems (79%). Sixty-seven percent of people reported having an educational attainment equal or less than high school, 65% were not currently employed, and almost 95% of the sample reported living with at least one individual. In terms of geographical distribution, we observed an equal distribution across northern, central and southern regions of Italy with half of individuals living in urban areas. However, only four percent of participants came from high transmission regions, while almost two-thirds of responses came from regions reporting moderate incidence rates (cumulative incidence rates from 97 to 490 cases per 100,000 (Supplementary table 2).

**Awareness and perceptions of government measures**

Overall, the vast majority of Italians in our sample reported being aware of the major recommendations during the time of this study, including hand washing (99.9%), physical distancing (99.8%), social distancing (98.9%), self-isolating if you believe you have the virus (98.2%), and self-quarantining if you are returning from a trip (96.4%).

Eighty-eight percent of individuals expressed that government measures were ‘very important’ for preventing and/or reducing the spread of COVID-19. Government measures were perceived as ‘appropriate’ by the majority (N=1071; 83%), and as ‘too lenient’ by the minority of the population (N= 175; 14%). Stratification by different population characteristics (e.g., age, sex, region or socio-economic status) did not reveal any statistically significant differences in perception of government measures. However, older adults (individuals over 51 years of age) generally reported the highest values for perceived importance of government policies (N=117;
92%), and appropriate strictness of the implemented measures (N=109; 87%) (Supplementary figures 1 and 2).

**Adherence and motivation to adhere to preventive behaviours**

Frequencies of practicing recommended hygiene measures most of the time were high for hand washing behaviour (N=1257; 96%), with significantly higher proportions observed among women compared to men. Overall, the adherence to social distancing behaviours was greater than 95% in our sample (for avoiding all social gatherings). In terms of physical distancing behaviours, the proportion of those maintaining 2 meters distance from others was 93%, but variations were observed among subsets of the population with different age and educational level. In contrast, a substantial proportion of individuals reported never self-quarantining if returning from a trip (26%) nor self-isolating if they had/believed they had the virus (23%). Individuals with current employment reported lower adherence to both of these behaviours when compared to the unemployed individuals (employed individuals: 68%, and 71%; unemployed individuals: 78%, and 78%; for self-quarantining and self-isolating, respectively) (Table 2).

**COVID-19 related concerns**

Our PCA analysis revealed that the study sample reported having lower levels of health concerns for oneself (M±SD=2.73±0.87) and personal financial situation (M±SD=2.56±0.90) relative to concerns regarding the health of other individuals and about the economy of the country (M±SD=3.51±0.60, and M±SD=3.33 ± 0.58, respectively) (Table 3). Our stratified analyses revealed that women expressed significantly higher levels of concerns across all four factors compared to men. Furthermore, older adults, people with higher education and currently employed reported significantly higher levels of personal health concerns. Lastly, we observed
significantly higher levels of personal financial concerns among less educated individuals in comparison to individuals with higher education (p=0.003).

**Association between COVID-19 related concerns and practicing preventive behaviours**

With the aim of identifying whether COVID-19 concerns might be associated with adherence to preventive measures, a multivariate analysis was performed. After adjustments for sex, age, education and region, our models revealed that only health concerns for others were significantly associated with better adherence to handwashing ($\beta = 0.871$, p<0.001 (Table 4). When evaluating the effects of personal health concerns on other preventive behaviours, results were not statistically significant; however, we noticed effects with similar directions, but with smaller magnitudes ($\beta = 0.432$, p=0.077 for social distancing; $\beta = 0.231$, p=0.092 for self-isolating). Interestingly, COVID-19 related concerns were not significantly associated with adherence to other preventive measures (i.e., physical distancing and self-quarantining).

**Discussion**

Data from the initial wave of the COVID-19 epidemic in Italy suggested great awareness and broad acknowledgment of the importance and appropriateness of COVID-19 policy measures by the citizens. We observed a high level of adherence to major preventive behaviours, especially for hygiene and social distancing measures (over 95%). Of note, self-isolation in case COVID-19 positive or suspected was a less frequently adopted behaviour (23% of individuals reported non-adherence), especially among currently employed individuals. Surveyed participants, mainly females and young, reported greater level of concerns about the health of other individuals and the economic situation of the country, rather than their own health and personal finances. Higher
levels of concerns for others were significantly associated with higher adherence to preventive hygiene measures (mostly hand washing behaviour).

Our analyses provide insights on how COVID-19 related concerns, which represent vital aspects of society-level reactions and pandemic response, can influence the degree of adherence to preventive behaviours. Interestingly, only adherence to handwashing behaviour was significantly associated with greater concerns for other individuals after adjusting for age, sex, education and region. When taking a broader look at the government communication around hand-washing behaviour during the initial stages of the pandemic, it seems that major efforts were directed toward educating the public around proper hand-washing, and promoting engagement in this behaviours through social media campaigns in support to the WHO-launched initiative (#SafeHandsChallenge) (17,18). Besides that, provision of desifencact materials in the community was warranted through legal entactment (19). Our data on generally high levels of engagement may testify to the sucesfulness of the government initiatives, even though some sections of the population reported lower adherence, notably male individuals, which is in line with the current Italian literature (20). With the arrival of winter months, government messages included benefits of avoiding dual threats (COVID-19 and influenza) when practicing this behaviour (21). If we consider that global estimates show worrying decreases in handwashing behaviour over time (94% vs 65% adherence levels in March and August 2020, respectively) (22), our findings shed interesting light about the potential of leveraging the importance of protecting close individuals in order to maintain motivation in the Italian public to practice hygiene measures continuously.

Even though our models did not yield significant associations for other behaviours, we observed high levels of non-adherence to self-isolation behaviour in the entire Italian sample. Current
evidence suggests that isolation for individuals when symptomatic or with potential contact with a COVID-19 case is crucial for reducing incidence (from 44% to 96% of incidence cases potentially prevented) and mortality (from 31% to 76% of deaths potentially prevented) (23).

Uniformly, 23% of the individuals in our young sample reported non adherence to self-isolating when symptomatic or COVID-19 positive. Moreover, our stratified analyses suggested that current employment and living with others might be important drivers of this non-adherence.

Young adults might have lacked the physical capacity to isolate in their living environment and those who were employed at the time of our survey were most likely engaged in employments that were not possible to perform from home. Our estimates are aligned with the figures from the national census data (2019), which suggested that a staggering 64% of individuals aged from 18 to 34 in Italy lives with their parents, and 60% is either studying or without occupation (24).

Nevertheless, our finding suggests that the adherence to this critical behaviour might depend on upstream factors such as socio-economic and living situation. It further emphasises the core concept of behaviour change models rooted in the iCARE study, highlighting that all model components (capability, opportunity and motivation) need to be present in order for the behaviour to be enacted (5,6). Despite the Italian lockdown scenario at the beginning of the pandemic, where awareness of the policies (capability) (25–27), perceptions of policy importance and concerns (motivation) were high, opportunity to enact the self-isolation behaviour was likely missing. Our findings highlight the need of decision makers to address these barriers by providing physical infrastructures and economic support incentives in order to guarantee that younger portions of the population do not remain negatively impacted by government interventions (28,29).
There is growing literature demonstrating sex-specific differences not only in the epidemiology of COVID-19 (30), but also in responses to and consequences of the pandemic. In our sample, women expressed higher levels of concerns and better adherence to COVID-19 policies, which is in line with surveys conducted in a similar timeframe in Italy (26,31,32). Our results might be linked to higher health literacy (33) and better adherence to preventive behaviors that have been traditionally reported in women during epidemics (34–36). Secondly, women and men experience psychologically and biologically diverse reactions to stress, leading to higher vulnerability and striking differences in the epidemiology of psychiatric disorders that are more prevalent in women (37,38). Thirdly, risk perception is an important factor that can shape social reactions to the pandemic and is usually reported to be lower among men, regardless of setting (20,39,40). Ultimately, women traditionally have different societal roles and pressures that might have led to differential responses to the pandemic compared to men. For instance, women’s socially prescribed role as caregivers within the healthcare sector and beyond might have placed them in a position of higher susceptibility to experience increased levels of stress and concerns (41). Considering that our sample largely consisted of female individuals, higher concerns for the health of others may indeed be explained by above mentioned factors, highlighting the great necessity to further explore gender-related aspects of the pandemic responses.

Beyond sex-specific differences, we observed differential responses to the pandemic in Italy across diverse age groups. Even though younger adults reported high levels of perceived importance of policy measures, they were significantly less compliant to maintaining physical distance from other individuals (20,36). It is important to note that, similar to previous studies conducted in Italy, the younger adults in our sample were also less concerned about personal health compared to their older counterparts (20). Considering that the younger population is
currently driving the increases in transmission in Italy and across the globe (42,43), our findings might suggest that they are likely underestimate the risks of acquiring the infection as well as their role of being carriers of the infection. Consistent with the previous surveys findings (44–47), our data indicate that messages sensitive to the demographic target (i.e. younger adults), might benefit from an approach that would allow maintaining realistic perceptions of the risks throughout each stage of the pandemic. These implications remain a priority for reducing community transmission and protecting vulnerable populations in Italy.

Our study has some limitations that need to be acknowledged. The study design is cross-sectional in nature, which restricts our ability to make causal inference. Our sample is a convenience sample, not representative of the whole Italian population, that was recruited using internet survey methodology. Lastly, even though the iCARE questionnaire did not implement validated scales, we used robust statistical methods to determine the psychometric properties of our concerns variables. We performed sensitivity analysis and observed similar factor structures in the global convenience sample and representative sample in Canada, which further strengthens the validity of our results linking concern types to behavioural adherence. Additional strengths of our research include theoretical background - the survey was designed in line with important theories of behaviour change (such as COM-B and Health Beliefs Model). This of particular importance in the context of the unprecedented pandemic, as it has become apparent that human behaviour represents a key to the success of any public health measure, from testing and contact tracing, to isolation, adoption of personal preventive behaviours and vaccine acceptance (5). In order to implement successful policies and communication strategies leading to large scale behaviour change, it is crucial to have methodologically-sound and theory-driven scientific understanding of the complex processes that influence human behaviour. Hence, insights and
feedback from behavioural and psychological scientists should be embedded in cross-disciplinary collaborations and placed at the forefront of national and international pandemic responses. The timing and the substantial sample size of the survey represents an further strength of the current analyses, allowing us to capture populational responses in one of the hardest hit nations in the world and during the critical lockdown period.

In conclusion, the findings of the current study offer valuable insights about the population behavioural responses and concerns in regards to the initial pandemic phase of COVID-19 in Italy. We observed high level of awareness and adherence to recommended behaviours, mainly hygiene and social distancing measures. Adherence to self-isolation and quarantine behaviours was substantially lower, with almost a quarter of the population not adhering to these behaviours most of the time. Our sample reported elevated concerns about the health of other individuals and the economic situation of the country, notably among women and older individuals. Notwithstanding certain limitations, our findings suggest that COVID-19 public information campaigns might leverage health concerns for others to promote messages focusing on solidarity and the advantages of helping each other in order to allow large scale adherence to preventive behaviours. We believe that targeting risk-communication efforts at younger individuals as well as men, could potentially lead to higher compliance rates in future pandemic waves. On the other hand, adherence to certain measures, such as quarantining after travelling or isolating if COVID-19 positive or suspected, might fall outside complete individuals’ control, and governments should provide social and economic infrastructures to ensure that sections of the population do not remain disproportionately disadvantaged by the implemented policies. Our early-pandemic results offer important implications for informing current government policies and strategies that are tackling the second pandemic wave in Italy.
Conflict of interest

None declared.

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Note: The full list of the iCARE study team is available in the Supplementary Table 4.
Key-points

- This cross-sectional survey recruited 1,332 participants in Italy and observed high levels of adherence to hygiene and social distancing measures (96%), and lower levels of adherence to self-isolation if suspected or COVID-19 positive (77%)
- Italians reported high levels of concerns regarding health of other individuals and economy of the country
- Multivariate models showed that individuals with higher health concerns for others were more likely to adhere to hand washing behaviour
- Communication of COVID-19 mitigation policies should consider addressing people’s concerns regarding the health of other individuals to motivate adherence to prevention measures
- In order to avoid unequal impacts of policies and allow adherence to self-isolating measures (especially among young working adults), governments should establish social and economic support for individuals
References

1. World Health Organization (WHO). Timeline of WHO’s response to COVID-19 [Internet]. [cited 2020 Oct 27]. Available from: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/interactive-timeline

2. Anderson RM, Heesterbeek H, Klinkenberg D, Hollingsworth TD. How will country-based mitigation measures influence the course of the COVID-19 epidemic? [Internet]. Vol. 395, The Lancet. Lancet Publishing Group; 2020 [cited 2020 Oct 27]. p. 931–4. Available from: https://pubmed.ncbi.nlm.nih.gov/32164834/

3. The Lancet. Redefining vulnerability in the era of COVID-19 [Internet]. Vol. 395, The Lancet. Lancet Publishing Group; 2020 [cited 2020 Oct 27]. p. 1089. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7270489/

4. Bucciardini R, Contoli B, De Castro P, Donfrancesco C, Falzano L, Ferrelli R, et al. The health equity in all policies (HEiAP) approach before and beyond the Covid-19 pandemic in the Italian context [Internet]. Vol. 19, International Journal for Equity in Health. BioMed Central Ltd.; 2020 [cited 2020 Oct 27]. p. 92. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7278241/

5. West R, Michie S, Rubin GJ, Amlôt R. Applying principles of behaviour change to reduce SARS-CoV-2 transmission [Internet]. Vol. 4, Nature Human Behaviour. Nature Research; 2020 [cited 2020 Oct 27]. p. 451–9. Available from: https://pubmed.ncbi.nlm.nih.gov/32377018/

6. Michie S, van Stralen MM, West R. The behaviour change wheel: A new method for characterising and designing behaviour change interventions. Implement Sci [Internet]. 2011 Apr 23 [cited 2020 Oct 27];6(1):42. Available from: /pmc/articles/PMC3096582/?report=abstract
7. Rosenstock IM, Strecher VJ, Becker MH. Social Learning Theory and the Health Belief Model. Heal Educ Behav [Internet]. 1988 [cited 2020 Oct 27];15(2):175–83. Available from: https://pubmed.ncbi.nlm.nih.gov/3378902/

8. Boccia S, Cascini F, McKee M, Ricciardi W. How the Italian NHS Is Fighting Against the COVID-19 Emergency. Front Public Heal [Internet]. 2020 May 8 [cited 2020 Oct 27];8. Available from: https://pubmed.ncbi.nlm.nih.gov/32573563/

9. Boccia S, Ricciardi W, Ioannidis JPA. What Other Countries Can Learn From Italy During the COVID-19 Pandemic. JAMA Intern Med [Internet]. 2020 Jul 1 [cited 2020 Oct 27];180(7):927. Available from: https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2764369

10. The Council of Ministers. Government of Italy Decree of the President of the Council of Ministers 11 March 2020. [Internet]. Available from: https://www.esteri.it/mae/resource/doc/2020/03/decreto__11_marzoen.pdf

11. Bacon SL, Lavoie KL, Boyle J, Stojanovic J, Joyal-Desmarais K. International assessment of the link between COVID-19 related attitudes, concerns and behaviours in relation to public health policies: Optimising policy strategies to improve health, economic and quality of life outcomes (the iCARE Study). BMJ Open [Internet]. 2021 Mar 11 [cited 2021 Apr 14];11(3). Available from: https://pubmed.ncbi.nlm.nih.gov/33707274/

12. von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. J Clin Epidemiol [Internet]. 2008 Apr [cited 2020 Oct 27];61(4):344–9. Available from: https://pubmed.ncbi.nlm.nih.gov/18313558/
13. Rosenstock IM. The Health Belief Model and Preventive Health Behavior. Health Educ Monogr [Internet]. 1974 Dec 1 [cited 2020 Oct 27];2(4):354–86. Available from: http://journals.sagepub.com/doi/10.1177/10901981740200405

14. Istituto Superiore di Sanità (ISS). Epidemia COVID-19. Aggiornamento nazionale 28 aprile 2020. [Internet]. Rome; [cited 2020 Oct 27]. Available from: https://www.epicentro.iss.it/coronavirus/bollettino/Bollettino-sorveglianza-integrata-COVID-19_28-aprile-2020.pdf

15. Riccardo F, Ajelli M, Andrianou X, Bella A, Del Manso M, Fabiani M, et al. Epidemiological characteristics of COVID-19 cases in Italy and estimates of the reproductive numbers one month into the epidemic. medRxiv [Internet]. 2020 Apr 11 [cited 2020 Oct 27];2020.04.08.20056861. Available from: https://doi.org/10.1101/2020.04.08.20056861

16. Kaiser HF. The Application of Electronic Computers to Factor Analysis. Educ Psychol Meas [Internet]. 1960 Apr 2 [cited 2020 Oct 27];20(1):141–51. Available from: http://journals.sagepub.com/doi/10.1177/001316446002000116

17. #SafeHandsChallenge: accetta la sfida dell’Oms per lavare bene le mani [Internet]. [cited 2021 Jan 26]. Available from: http://www.salute.gov.it/portale/nuovocoronavirus/dettaglioNotizieNuovoCoronavirus.jsp?lingua=italiano&menu=notizie&p=dalministero&id=4287

18. #Io restoacasa e lavo le mani in 12 mosse [Internet]. [cited 2021 Jan 26]. Available from: http://www.salute.gov.it/portale/nuovocoronavirus/dettaglioNotizieNuovoCoronavirus.jsp?lingua=italiano&menu=notizie&p=dalministero&id=4180

19. Covid-19, nuove raccomandazioni di igiene contro il virus [Internet]. [cited 2021 Jan 26]. Available from:
20. Savadori L, Lauriola M. Risk Perception and Protective Behaviors During the Rise of the COVID-19 Outbreak in Italy. Front Psychol [Internet]. 2021 Jan 13 [cited 2021 Apr 14];11. Available from: https://pubmed.ncbi.nlm.nih.gov/33519593/

21. Lavare le mani, una mossa semplice che vale doppio [Internet]. [cited 2021 Jan 26]. Available from:
http://www.salute.gov.it/portale/nuovocoronavirus/dettaglioMaterialiNuovoCoronavirus.jsp?lingua=italiano&id=44&area=nuovoCoronavirus&menu=vuoto

22. iCARE Study – Cumulative Results – Surveys 1 to 6 – MBMC [Internet]. [cited 2021 Jan 26]. Available from: https://mbmc-cmcm.ca/covid19/research/stats/cumul-demog/

23. Nussbaumer-Streit B, Mayr V, Dobrescu AI, Chapman A, Persad E, Klerings I, et al. Quarantine alone or in combination with other public health measures to control COVID-19: a rapid review. Vol. 2020, Cochrane Database of Systematic Reviews. John Wiley and Sons Ltd; 2020.

24. Istituto Nazionale di Statistica. Aspetti della vita quotidiana : Principali dati [Internet]. [cited 2020 Oct 27]. Available from: http://dati.istat.it/Index.aspx?QueryId=17631

25. Gallè F, Sabella EA, Da Molin G, De Giglio O, Caggiano G, Di Onofrio V, et al. Understanding knowledge and behaviors related to covid−19 epidemic in italian undergraduate students: The epico study. Int J Environ Res Public Health [Internet]. 2020 May 2 [cited 2020 Oct 27];17(10). Available from: /pmc/articles/PMC7277609/?report=abstract

26. Pagnini F, Bonanomi A, Tagliabue S, Balconi M, Bertolotti M, Confalonieri E, et al. Knowledge, Concerns, and Behaviors of Individuals During the First Week of the Coronavirus
Disease 2019 Pandemic in Italy. JAMA Netw open [Internet]. 2020 Jul 1 [cited 2020 Oct 27];3(7):e2015821. Available from: https://jamanetwork.com/

La Torre G, Lia L, Dorelli B, Marte M, Chiappetta M, Faticoni A, et al. How Much Do Young Italians Know About COVID-19 and What Are Their Attitudes Toward SARS-CoV-2? Results of a Cross-Sectional Study. Disaster Med Public Health Prep [Internet]. 2020 [cited 2020 Oct 27];1. Available from: /pmc/articles/PMC7385315/?report=abstract

Maqbool A, Khan NZ. Analyzing barriers for implementation of public health and social measures to prevent the transmission of COVID-19 disease using DEMATEL method. Diabetes Metab Syndr Clin Res Rev [Internet]. 2020 Sep 1 [cited 2021 Jan 18];14(5):887–92. Available from: /pmc/articles/PMC7293847/?report=abstract

Coroiu A, Moran C, Campbell T, Geller AC. Barriers and facilitators of adherence to social distancing recommendations during COVID-19 among a large international sample of adults. Capraro V, editor. PLoS One [Internet]. 2020 Oct 7 [cited 2021 Jan 18];15(10):e0239795. Available from: https://dx.plos.org/10.1371/journal.pone.0239795

Gebhard C, Regitz-Zagrosek V, Neuhauser HK, Morgan R, Klein SL. Impact of sex and gender on COVID-19 outcomes in Europe [Internet]. Vol. 11, Biology of Sex Differences. BioMed Central Ltd.; 2020 [cited 2020 Oct 27]. p. 1–13. Available from: https://doi.org/10.1186/s13293-020-00304-9

Gualano MR, Lo Moro G, Voglino G, Bert F, Siliquini R. Effects of COVID-19 lockdown on mental health and sleep disturbances in Italy. Int J Environ Res Public Health [Internet]. 2020 Jul 1 [cited 2021 Apr 14];17(13):1–13. Available from: /pmc/articles/PMC7369943/
32. Balsamo M, Carlucci L. Italians on the Age of COVID-19: The Self-Reported Depressive Symptoms Through Web-Based Survey. Front Psychol [Internet]. 2020 Oct 16 [cited 2021 Apr 14];11. Available from: https://pubmed.ncbi.nlm.nih.gov/33178074/

33. Sørensen K, Pelikan JM, Röthlin F, Ganahl K, Slonska Z, Doyle G, et al. Health literacy in Europe: Comparative results of the European health literacy survey (HLS-EU). Eur J Public Health [Internet]. 2015 Dec 1 [cited 2020 Oct 27];25(6):1053–8. Available from: https://academic.oup.com/eurpub/article/25/6/1053/2467145

34. Moran KR, Del Valle SY. A meta-analysis of the association between gender and protective behaviors in response to respiratory epidemics and pandemics. PLoS One [Internet]. 2016 Oct 1 [cited 2020 Oct 27];11(10):164541. Available from: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0164541

35. Fung ICH, Cairncross S. How often do you wash your hands? A review of studies of hand-washing practices in the community during and after the SARS outbreak in 2003 [Internet]. Vol. 17, International Journal of Environmental Health Research. Int J Environ Health Res; 2007 [cited 2020 Oct 27]. p. 161–83. Available from: https://pubmed.ncbi.nlm.nih.gov/17479381/

36. Carlucci L, D’ambrosio I, Balsamo M. Demographic and attitudinal factors of adherence to quarantine guidelines during covid-19: The italian model. Front Psychol [Internet]. 2020 Oct 1 [cited 2021 Apr 14];11. Available from: https://pubmed.ncbi.nlm.nih.gov/33192820/

37. Kajantie E, Phillips DIW. The effects of sex and hormonal status on the physiological response to acute psychosocial stress [Internet]. Vol. 31, Psychoneuroendocrinology. Psychoneuroendocrinology; 2006 [cited 2020 Oct 27]. p. 151–78. Available from: https://pubmed.ncbi.nlm.nih.gov/16139959/
38. Balhara YS, Verma R, Gupta C. Gender differences in stress response: Role of developmental and biological determinants. Ind Psychiatry J [Internet]. 2012 [cited 2020 Oct 27];20(1):4. Available from: /pmc/articles/PMC3425245/?report=abstract

39. Dryhurst S, Schneider CR, Kerr J, Freeman ALJ, Recchia G, van der Bles AM, et al. Risk perceptions of COVID-19 around the world. J Risk Res [Internet]. 2020 May 5 [cited 2020 Oct 27];1–13. Available from: https://www.tandfonline.com/doi/full/10.1080/13669877.2020.1758193

40. Gustafson PE. Gender differences in risk perception: Theoretical and methodological perspectives [Internet]. Vol. 18, Risk Analysis. Plenum Publ Corp; 1998 [cited 2020 Oct 27]. p. 805–11. Available from: https://pubmed.ncbi.nlm.nih.gov/9972583/

Note: A list of additional references is available in the Supplementary material.
Table 1. Descriptive characteristics of the Italian sample (N=1332)

| Variable                           | N     | %    |
|------------------------------------|-------|------|
| **Sex**                            |       |      |
| Men                                | 422   | 32.0 |
| Women                              | 899   | 68.1 |
| **Missing values**                  | 11    |      |
| **Age**                            |       |      |
| Less than or equal to 25 years     | 749   | 57.0 |
| 26-50 years                        | 438   | 33.3 |
| 51 years or more                   | 127   | 9.7  |
| **Missing values**                  | 18    |      |
| **Education level**                |       |      |
| High school or lower               | 861   | 66.5 |
| Graduate or Postgraduate degree    | 434   | 33.5 |
| **Missing values**                  | 37    |      |
| **Region**                         |       |      |
| South                              | 525   | 40.4 |
| Centre                             | 425   | 32.7 |
| North                              | 350   | 26.9 |
| **Missing values**                  | 32    |      |
| **Region (transmission)**          |       |      |
| Low transmission regions           | 480   | 36.92|
| Moderate transmission regions      | 769   | 59.15|
| High transmission regions          | 51    | 3.92 |
| **Missing values**                  | 32    |      |
| **Residential area**               |       |      |
| Rural or Country area              | 475   | 36.3 |
| Suburban or Regional               | 175   | 13.4 |
| Urban or City                      | 657   | 50.3 |
| **Missing values**                  | 25    |      |
| **Current employment status**      |       |      |
| No                                 | 863   | 64.8 |
| Yes                                | 332   | 24.9 |
| **Missing values**                  | 137   |      |
| **Living situation**               |       |      |
| Alone                              | 69    | 5.42 |
| With one individual                | 286   | 22.45|
| With 2 or more individuals         | 919   | 72.13|
| **Missing values**                  | 58    |      |
| **Health condition at risk***      |       |      |
| No                                 | 1032  | 78.7 |
| Yes                                | 280   | 21.3 |
| **Missing values**                  | 20    |      |

*Includes: any heart disease or history of heart attack or stroke, any chronic lung disease (e.g., asthma, chronic obstructive pulmonary disease, emphysema/chronic bronchitis); active/current cancer; hypertension; diabetes; severe obesity; any
autoimmune disease (e.g., lupus, multiple sclerosis, rheumatoid arthritis, psoriasis, Crohn's disease, inflammatory bowel disease;
Table 2. Frequency of practicing different behaviours in the last 7 days (overall sample and stratified by different population characteristics).

| Behaviours (N (%)) | Hygiene | Physical distancing | Self-quarantining | Self-isolating | Social distancing |
|--------------------|---------|---------------------|-------------------|---------------|------------------|
|                    | Hand washing | At least 6 feet/1-2 metres away from others | If returning from a trip | If COVID-19 positive or suspected | Avoiding all social gatherings |
| Overall            | 1257 (95.6%) | 1212 (93.0%) | 747 (74.3%) | 811 (76.5%) | 1260 (96.0%) |
| Sex                |          |                  |                  |               |                 |
| Male               | 387 (92.8%) | 378 (91.3%) | 218 (74.2%) | 246 (77.4%) | 400 (95.7%) |
| Female             | 861 (97.0%) | 826 (93.8%) | 524 (74.4%) | 560 (76.1%) | 850 (96.1%) |
| Age                |          |                  |                  |               |                 |
| ≤ 25 years         | 710 (95.1%) | 671 (91.2%) | 418 (74.6%) | 453 (76.0%) | 713 (95.7%) |
| 26-50 years        | 409 (95.3%) | 403 (94.4%) | 255 (74.8%) | 275 (78.1%) | 413 (96.3%) |
| ≥ 51 years         | 125 (98.4%) | 125 (98.4%) | 70 (72.9%) | 76 (73.8%) | 121 (96.0%) |
| Region of transmission |      |                  |                  |               |                 |
| Low                | 456 (95.0%) | 436 (91.8%) | 316 (77.3%) | 326 (77.3%) | 465 (96.9%) |
| Moderate           | 736 (95.8%) | 708 (93.3%) | 388 (71.2%) | 441 (75.3%) | 734 (95.8%) |
| High               | 49 (96.1%)  | 51 (100.0%) | 30 (79.0%)  | 32 (82.1%)  | 47 (94.0%) |
| Education          |          |                  |                  |               |                 |
| Low                | 821 (95.7%) | 778 (91.6%) | 488 (74.7%) | 532 (76.8%) | 815 (95.2%) |
| High               | 413 (95.2%) | 410 (95.4%) | 251 (74.3%) | 268 (76.4%) | 423 (97.5%) |
| Current employment |          |                  |                  |               |                 |
| No                 | 825 (95.6%) | 791 (92.7%) | 527 (77.8%) | 558 (78.3%) | 827 (96.2%) |
| Yes                | 318 (96.1%) | 312 (94.3%) | 169 (67.6%) | 188 (71.2%) | 317 (95.5%) |
| Living situation   |          |                  |                  |               |                 |
| Alone              | 1152 (95.7%) | 1107 (92.8%) | 49 (83.1%)  | 51 (83.6%)  | 1153 (96.0%) |
| With others        | 64 (92.8%)  | 65 (95.6%)  | 680 (73.8%) | 739 (76.0%) | 67 (97.1%) |

*p presenting frequencies and proportions of individuals engaging in the behaviour Most of the time *p values < 0.05 are marked in bold text
Table 3. COVID-19 related concerns stratified by socio-demographic characteristics of the sample (presenting mean values of the different factor structures)

|                        | COVID-19 related concerns |
|------------------------|---------------------------|
|                        | Health concerns (self) | Health concerns others | Personal financial concerns | Social/ Economic concerns |
| Overall                | $2.73 \pm 0.87$ | $3.51 \pm 0.60$ | $2.56 \pm 0.90$ | $3.33 \pm 0.58$ |
| N                      | 1309                 | 1313               | 1314               | 1315               |
| Sex                    |                       |                    |                    |                    |
| Men                    | $2.66 \pm 0.85$ | $3.34 \pm 0.67$ | $2.36 \pm 0.90$ | $3.23 \pm 0.62$ |
| N                      | 417                  | 417                | 418                | 418                |
| Women                  | $2.77 \pm 0.88$ | $3.59 \pm 0.54$ | $2.65 \pm 0.89$ | $3.38 \pm 0.56$ |
| N                      | 883                  | 887                | 886                | 887                |
| p-value                | $0.0141$             | $<0.0001$          | $<0.0001$          | $<0.0001$          |
| Age                    |                       |                    |                    |                    |
| ≤ 25 years             | $2.63 \pm 0.86$ | $3.5 \pm 0.57$   | $2.58 \pm 0.92$ | $3.34 \pm 0.57$ |
| N                      | 743                  | 745                | 745                | 746                |
| 26-50 years            | $2.78 \pm 0.85$ | $3.52 \pm 0.62$ | $2.56 \pm 0.89$ | $3.31 \pm 0.60$ |
| N                      | 429                  | 429                | 430                | 430                |
| ≥ 51 years             | $3.19 \pm 0.81$ | $3.52 \pm 0.68$ | $2.46 \pm 0.88$ | $3.38 \pm 0.61$ |
| N                      | 124                  | 126                | 126                | 126                |
| p-value                | $<0.0001$            | 0.09               | 0.37               | 0.41               |
| Education              |                       |                    |                    |                    |
| High school or lower   | $2.67 \pm 0.87$ | $3.52 \pm 0.58$ | $2.61 \pm 0.91$ | $3.33 \pm 0.58$ |
| N                      | 855                  | 858                | 858                | 859                |
| Graduate or Postgraduate | $2.86 \pm 0.86$ | $3.49 \pm 0.62$ | $2.45 \pm 0.89$ | $3.32 \pm 0.60$ |
| N                      | 433                  | 433                | 434                | 434                |
| p-value                | $0.0004$             | 0.94               | 0.003              | 0.74               |
| Region of transmission |                       |                    |                    |                    |
| Low                    | $2.78 \pm 0.87$ | $3.6 \pm 0.52$   | $2.68 \pm 0.90$ | $3.36 \pm 0.56$ |
| N                      | 478                  | 480                | 480                | 480                |
| Intermediate           | $2.69 \pm 0.87$ | $3.46 \pm 0.63$ | $2.48 \pm 0.89$ | $3.32 \pm 0.59$ |
| N                      | 766                  | 767                | 767                | 768                |
| High                   | $2.87 \pm 0.83$ | $3.41 \pm 0.61$ | $2.6 \pm 1.03$   | $3.24 \pm 0.67$ |
| N                      | 49                   | 50                 | 51                 | 51                 |
| p-value                | 0.14                 | 0.0008             | 0.0013             | 0.39               |
| Current employment     |                       |                    |                    |                    |
| No                     | $2.66 \pm 0.87$ | $3.52 \pm 0.58$ | $2.58 \pm 0.91$ | $3.34 \pm 0.57$ |
| N                      | 861                  | 861                | 861                | 862                |
| Yes                    | $2.94 \pm 0.85$ | $3.51 \pm 0.65$ | $2.49 \pm 0.88$ | $3.32 \pm 0.63$ |
| N                      | 330                  | 331                | 332                | 332                |
| p-value                | $0.0001$             | 0.4949             | 0.1286             | 0.8955             |
| Living situation       |                       |                    |                    |                    |
Table 4. Logistic regression model estimating adherence to various preventive behaviours and COVID-19 related concerns.

| COVID-19 related concerns | Health concerns (self) | Health concerns (others) | Personal financial concerns | Social/Economic concerns |
|---------------------------|------------------------|--------------------------|----------------------------|--------------------------|
| Alone                     | M ± SD                 | 2.83 ± 0.87              | 3.33 ±0.75                 | 2.55 ± 0.97              | 3.38 ± 0.55              |
|                           | N                      | 69                       | 68                         | 69                       | 69                       |
| With others               | M ± SD                 | 2.72 ± 0.87              | 3.52 ± 0.58                | 2.56 ± 0.90              | 3.33 ± 0.59              |
|                           | N                      | 1198                     | 1203                       | 1203                     | 1204                     |
| p-value                   | 0.3516                 | 0.1118                   | 0.9691                     | 0.4864                   |

*M-mean; SD-standard deviation;

Table 4. Logistic regression model estimating adherence to various preventive behaviours and COVID-19 related concerns.

|                                | Estimate | SE $^b$ | 95% CI $^c$ lower | 95% CI $^c$ upper | p-value $^d$ |
|--------------------------------|----------|---------|------------------|------------------|--------------|
| **Hand washing with soap and water** $^a$ |          |         |                  |                  |              |
| Intercept                      | -0.485   | 1.129   | -2.697           | 1.727            | 0.667        |
| Health concerns (self) (Continuous) | -0.333   | 0.189   | -0.703           | 0.036            | 0.077        |
| Health concerns (others) (Continuous) | 0.831    | 0.232   | 0.376            | 1.286            | <0.001       |
| Personal financial concerns (Continuous) | -0.094   | 0.168   | -0.422           | 0.235            | 0.576        |
| Social/economic concerns (Continuous) | 0.115    | 0.235   | -0.346           | 0.575            | 0.626        |
| Sex (Men vs Women)             | -0.796   | 0.289   | -1.362           | -0.231           | 0.006        |
| Age (Continuous)               | 0.055    | 0.020   | 0.015            | 0.095            | 0.007        |
| Education (High vs. Low)       | 0.395    | 0.313   | -0.219           | 1.009            | 0.207        |
| Transmission region (High vs Low) | -0.020   | 0.777   | -1.543           | 1.503            | 0.979        |
| Transmission region (Medium vs Low) | 0.144    | 0.292   | -0.429           | 0.717            | 0.622        |

*Goodness-of-Fit Test (p=0.528)

|                                | Estimate | SE $^b$ | 95% CI $^c$ lower | 95% CI $^c$ upper | p-value $^d$ |
|--------------------------------|----------|---------|------------------|------------------|--------------|
| **Hand washing with soap and water** $^a$ |          |         |                  |                  |              |
| Intercept                      | 1.026    | 1.021   | -0.974           | 3.027            | 0.315        |
| Health concerns (self) (Continuous) | 0.036    | 0.141   | -0.240           | 0.312            | 0.800        |
| Health concerns (others) (Continuous) | -0.169   | 0.213   | -0.586           | 0.248            | 0.427        |
| Personal financial concerns (Continuous) | 0.122    | 0.131   | -0.136           | 0.379            | 0.354        |
| Social/economic concerns (Continuous) | 0.074    | 0.195   | -0.309           | 0.456            | 0.706        |
| Sex (Men vs Women)             | -0.494   | 0.232   | -0.948           | -0.040           | 0.033        |
| Age (Continuous)               | 0.063    | 0.019   | 0.026            | 0.101            | 0.001        |
| Education (High vs. Low)       | -0.141   | 0.273   | -0.676           | 0.394            | 0.606        |
| Transmission region (High vs Low) | 1.711    | 1.431   | -1.094           | 4.515            | 0.232        |
| Transmission region (Medium vs Low) | -0.002   | 0.226   | -0.445           | 0.442            | 0.994        |

*Goodness-of-Fit Test (p=0.279)
| Estimate | SE  | 95% CI  | p-value |
|----------|-----|---------|---------|
|          |     | lower   | upper   |
| **Self-isolating if COVID-19 positive or suspected**<sup>a</sup> | | |
| Intercept | 0.336 | 0.622 | -0.882 | 1.555 | 0.589 |
| Health concerns (self) (Continuous) | 0.014 | 0.097 | -0.175 | 0.204 | 0.883 |
| Health concerns (others) (Continuous) | 0.231 | 0.137 | -0.038 | 0.500 | 0.092 |
| Personal financial concerns (Continuous) | 0.089 | 0.091 | -0.088 | 0.267 | 0.324 |
| Social/economic concerns (Continuous) | -0.044 | 0.136 | -0.310 | 0.223 | 0.747 |
| Sex (Men vs Women) | 0.168 | 0.167 | -0.159 | 0.494 | 0.313 |
| Age (Continuous) | -0.005 | 0.007 | -0.018 | 0.008 | 0.444 |
| Education (High vs Low) | -0.003 | 0.167 | -0.330 | 0.324 | 0.986 |
| Transmission region (High vs Low) | 0.293 | 0.447 | -0.584 | 1.170 | 0.513 |
| Transmission region (Medium vs Low) | -0.018 | 0.160 | -0.332 | 0.296 | 0.910 |
| **Goodness-of-Fit Test (p=0.651)** | | |
| **Self-quarantining if returning from a trip**<sup>a</sup> | | |
| Intercept | 0.685 | 0.623 | -0.537 | 1.907 | 0.272 |
| Health concerns (self) (Continuous) | 0.074 | 0.096 | -0.115 | 0.263 | 0.441 |
| Health concerns (others) (Continuous) | 0.062 | 0.138 | -0.210 | 0.333 | 0.656 |
| Personal financial concerns (Continuous) | 0.084 | 0.091 | -0.094 | 0.263 | 0.355 |
| Social/economic concerns (Continuous) | 0.008 | 0.135 | -0.256 | 0.271 | 0.955 |
| Sex (Men vs Women) | 0.014 | 0.165 | -0.310 | 0.338 | 0.932 |
| Age (Continuous) | -0.005 | 0.007 | -0.018 | 0.008 | 0.455 |
| Education (High vs Low) | -0.035 | 0.167 | -0.362 | 0.292 | 0.834 |
| Transmission region (High vs Low) | 0.038 | 0.423 | -0.792 | 0.867 | 0.929 |
| Transmission region (Medium vs Low) | -0.225 | 0.161 | -0.541 | 0.091 | 0.163 |
| **Goodness-of-Fit Test (p=0.940)** | | |
| **Avoiding all social gatherings (large and small)**<sup>a</sup> | | |
| Intercept | 1.638 | 1.256 | -0.825 | 4.101 | 0.192 |
| Health concerns (self) (Continuous) | 0.220 | 0.196 | -0.164 | 0.604 | 0.261 |
| Health concerns (others) (Continuous) | 0.432 | 0.244 | -0.047 | 0.910 | 0.077 |
| Personal financial concerns (Continuous) | 0.160 | 0.176 | -0.186 | 0.505 | 0.365 |
| Social/economic concerns (Continuous) | -0.254 | 0.267 | -0.776 | 0.269 | 0.342 |
| Sex (Men vs Women) | 0.091 | 0.325 | -0.546 | 0.728 | 0.780 |
| Age (Continuous) | 0.020 | 0.018 | -0.015 | 0.056 | 0.258 |
| Education (High vs Low) | -0.534 | 0.389 | -1.297 | 0.229 | 0.170 |
| Transmission region (High vs Low) | -0.650 | 0.794 | -2.205 | 0.905 | 0.413 |
| Transmission region (Medium vs Low) | -0.308 | 0.329 | -0.953 | 0.337 | 0.349 |
| **Goodness-of-Fit Test (p=0.854)** | | |

*a Probability of adhering to a particular behaviour Most of the time was modeled; b SE- Standard Error N-study sample; c 95% confidence interval for the regression parameters; d P-values for the Chi-Square test, testing the null hypothesis that the individual predictor’s regression coefficient equals to zero, given the other predictor variables are in the model; e Hosmer and Lemeshow Goodness of Fit Test